# FOREIGN DIRECT INVESTMENT AND TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGIES: CASE STUDIES IN THE ENERGY SECTORS OF ANGOLA AND SOUTH AFRICA

**by**

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# DECLARATION

This thesis was written and submitted in accordance with the rules and regulations governing the award of a Doctorate of the University of Pretoria. I declare that the thesis has, neither in part nor in whole, been presented for examination at another university.

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# ABSTRACT

Foreign direct investment (FDI) has been found a very important channel through which international technology transfer takes place, especially in the context of developed and emerging countries. But very little is known on transfer of environmentally sound technologies (ESTs) through FDI in the context of Africa. This policy-science study that brings empirical evidence, conceptual clarity and interdisciplinary approaches to African policymakers and practitioners deals with this crucial issue. The main aim of this study is to explore whether FDI can be used to transfer ESTs. It examines the inflow of FDI into Angolaôs energy sector and the outflow of direct investments from South Africaôs energy sector. It employs a conceptual framework that links government-imposed regulations and agencies, as well as international regimes, to govern the flow of FDI. It specifically analyses how two African countries use national regulations, agencies and international relations to influence FDI for the purposes of the transfer of ESTs. In the case of Angola, it looks at FDI inflows and the transfer of ESTs into the energy sector; while in the case of South Africa, the focus is on the transfer of ESTs out of the sector to other African countries, in particular Uganda.

The study produces two main findings. First, Angola uses its national legal and policy framework and institutions to regulate FDI flows for the purposes of acquiring ESTs in the energy sector. It specifically does so through employing structural power to invoke sovereignty principles and implementing these through particular institutions, as well as effectively interacting with international regimes. Second, South African does not purposely promote transfer of ESTs through outward FDI to other African countries, such as Uganda. One of the key conclusions of the study is that host countries (recipients) of FDI can invoke sovereignty principles enshrined in various national policy and legal frameworks, and deploy international relations to attract FDI-carrying ESTs. The two key recommendations from this study are as follows. First, African policymakers and practitioners should shun a reductionist approach to FDI and start viewing FDI as a multidimensional bundle of resources that can contribute in a multifaceted manner to sustainable development. Second, further policy-science researches that generate empirical evidence for African policymakers and practitioners engaged in international negotiations and programmes on FDI and technology transfer as well as sustainable development should be encouraged.

**Key Words**: Angola, energy, environmentally sound technologies, foreign direct investment, government-imposed distortions, international political economy, institutions; technology transfer, state centred, South Africa.

# ABBREVIATIONS/ACRONYMS

| | |
|---|---|
| AfDB | African Development Bank |
| Afrec | African Energy Commission |
| ANIP | Angola National Private Investment Agency |
| ASEA | Association of Electricity Corporations of Africa |
| AU | African Union |
| BAP | Bali Action Plan |
| BAPA | Buenos Aires Plan of Action |
| BESA | Banco Espírito Santo |
| BFA | Angola Foment Bank |
| BIT | Bilateral Investment Treaties |
| BNA | Banco Naçional de Angola |
| BNDES | Brazil State Development Bank |
| BRIC | Brazil, Russian, India, China |
| BP | British Petroleum |
| CDM | Clean Development Mechanism |
| CEMAC | Economic and Monetary Community of Central Africa |
| CEPICI | Investment Promotion Centre of Côte dôIvoire |
| COBA | Consultores de Engenharia e Ambiente |
| COMESA | Common Market for Eastern and Southern African |
| COP | Conference of Parties |
| CPI | Investment Promotion Centre |
| CTCN | Climate Technology Centre and Network |
| DBSA | Development Bank of Southern Africa |
| DIRCO | Department of International Relations and Co-operation |

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|---|---|
| DNA | Designated National Authority |
| DRC | Democratic Republic of Congo |
| DTAs | Double Taxation Agreements |
| DTI | Department of Trade and Industry |
| ECCAS | Economic Community of Central African States |
| ECOWAS | Economic Community of West African States |
| EDEL | Empresa de Distribuição de Electricidade |
| EGTT | Expert Group on Technology Transfer |
| EIA | Environmental Impact Assessment |
| ELD | Environmental Licensing Decree |
| ENE | Empresa Nacional de Electricidade de Angola |
| EPZ | Export Promotion Zone |
| EPCM | Engineering, Procurement, and Construction Management |
| ESTs | Environmentally Sound Technologies |
| ESMAP | Energy Sector Management Assistance Programme |
| ESSO | Exxon Mobil (international trade name) |
| FDI | Foreign Direct Investment |
| FIP | Finance and Investment Protocol |
| FSD | Financial Surveillance Department |
| GAMEK | Gabinete de Aproveitamento do Médio Kwanza |
| GATS | General Agreement on Trade in Services |
| GDP | Gross Domestic Product |
| GEF | Global Environment Facility |
| GGFR | Global Gas-Flaring Reduction |
| ICC | International Chamber of Commerce |
| ICSID | International Centre for Settlement of Investment Disputes |

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|---|---|
| IDC | Industrial Development Corporation |
| IFDI | Inward Foreign Direct Investment |
| IFZ | Industrial Free Zone |
| ILO | International Labour Organisation |
| IMF | International Monetary Fund |
| IPA | Investment Promotion Agency |
| IPE | International Political Economy |
| IPIECA | International Petroleum Industry Environmental Conservation Association |
| IPR | Intellectual Property Rights |
| IR | International Relations |
| IRSE | Instituto Regulador do Sector Eléctrico |
| ISO | International Standards Organisation |
| JI | Joint Implementation |
| JSE | Johannesburg Stock Exchange |
| KGRTC | Kafue Gorge Regional Training Centre |
| KIA | Kenya Investment Authority |
| LNG | Liquefied Natural Gas |
| LPG | Liquefied Petroleum Gas |
| M&A | Merger and Acquisition |
| MBITT | Model Bilateral Investment Treaty Template |
| MAI | Multilateral Agreement on Investment |
| MIGA | Multilateral Investment Guarantee Agency |
| MLF | Multilateral Fund |
| MINEA | Ministry of Energy and Water |
| MINPET | Ministry of Petroleum |
| MOU | Memorandum of Understanding |

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|---|---|
| MW | Megawatt |
| NEPAD | New Partnership for Africaôs Development |
| NGO | Non-Governmental Organisation |
| NIC | National Investment Council |
| NOSA | National Occupational Safety Association |
| OECD | Organisation for Economic Development and Co-operation |
| OEM | Original Equipment Manufacturer |
| OFDI | Outward Foreign Direct Investment |
| OHSAS | Occupational Health and Safety Advisory Services |
| OIZ | Oriental Industrial Zone |
| OPEC | Organisation of Petroleum Exporting Countries |
| OPIC | Overseas Private Investment Corporation |
| PIEPD | Environmental Protection for the Oil Industry |
| RDB | Rwanda Development Board |
| RECs | Regional Economic Communities |
| REDD | Reduce Greenhouse Gas Emissions from Deforestation and Forest Degradation |
| R&D | Research and Experimental Development |
| ROMPCO | Republic of Mozambique Pipeline Investments Company |
| SACU | Southern African Customs Union |
| SADC | Southern African Development Community |
| SAIIA | South African Institute of International Affairs |
| SAPP | Southern Africa Power Pool |
| SARB | South African Reserve Bank |
| SCCF | Special Climate Change Fund |
| SCIGID | State-Centred Institutional Government-Imposed Distortions |
| SEZ | Special Economic Zone |

| | |
|---|---|
| SHE | Safety, Health and Environment |
| SOE | State-Owned Enterprise |
| SPTL | Sasol Petroleum Temane Limitada |
| TEC | Technology Executive Committee |
| TIFA | Trade and Investment Framework Agreement |
| TIFID | Trade, Industry, Finance and Investment Directorate |
| TISA | Trade and Investment South Africa |
| TM | Technology Mechanism |
| TNA | Technology Needs Assessment |
| TNC | Transnational Corporation |
| TRIMS | Agreement on Trade-Related Investment Measures |
| TRIPS | Agreement on Trade-Related Aspects of Intellectual Property Rights |
| UEGCL | Uganda Electricity Generation Company |
| UEMOA | West African Economic and Monetary Union |
| UETCL | Uganda Electricity Transmission Company Limited |
| UK | United Kingdom |
| UN | United Nations |
| UNCED | United Nations Conference on Environment and Development |
| UNCHE | United Nations Conference on Human Environment |
| UNCITRAL | United Nations Commission on International Trade Law |
| UNCTAD | United Nations Conference on Trade and Development |
| UNCTADSTAT | United Nations Conference on Trade and Development Statistics |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| UNIDO | United Nations Industrial Development Organisation |
| UNFCCC | United Nations Framework Convention on Climate Change |

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|---|---|
| USA | United States of America |
| WAEMU | West African Economic and Monetary Union |
| WBCSD | World Business Council on Sustainable Development |
| WEC | World Economic Forum |
| WIPO | World Intellectual Property Organisation |
| WRI | World Resources Institute |
| WST | World Systems Theory |
| WTO | World Trade Organisation |

# CHAPTER 1: INTRODUCTION

## 1.1 BACKGROUND

The transfer of environmentally sound technologies (ESTs), particularly from industrialised countries of the North to developing countries such as those of Africa, has become a key issue in foreign policy and development circles. Since the late 1980s and early 1990s, developing countries in general, and African countries in particular, have put more currency on issues of EST transfer for the purposes of securing sustainable development. These countries have often argued for cost-effective ways of EST transfer, including through foreign direct investment (FDI) and development assistance.

FDI has overtaken the volume of development assistance and many countries are finding FDI a more secure way to finance sustainable development. Internationally, the FDI activities of transnational corporations (TNCs) are enabling some countries to reap much greater benefits than those associated with international trade. As such, the Organisation for Economic Development and Co-operation (OECD) notes that (1992: 209) ñé today, FDI in manufacturing and services rather than trade is leading internationalisation and is influencing strongly international location patterns for the production and exchange of goods and servicesò.

Generally, FDI can be considered as ñnot just the purchase of a sizable share in a company but, more importantly, the actual exercise of control and managementò (Razin *et al.* 1997: 6), and there are a number of perspectives on its benefits to firms, as well as to home and host economies. Anyangah (2010: 458) observes that FDI ñallows the investor to make a direct contribution towards the production processò. Sawada (2005: 7) also contends that ñFDI to developing countries does not only bring financial resources for capital formation but also technology. FDI provides direct technology transfer from the parent firms to their affiliates in developing countriesò. Likewise, the World Bank (1993: 1) notes that ñFDI brings with it considerable benefits: technology transfer, management know-how, and export marketing accessò, and Chowla (2005: 1) comments that ñFDI can infuse capital into an economy, create jobs, and can be a vehicle for transferring and upgrading technologyò.

Whilst it is generally agreed that technologies can be diffused through a variety of channels, for Damijani and others (2003: 190) FDI is attractive because ñit provides, arguably, the most important and cheapest channel of direct technology transfer to developing countriesò. Anyangah (2010: 458) noted three positive benefits that may accrue when using FDI as a vehicle for transferring technology. First, FDI can improve the projectôs financial prospects by increasing the efficiency with which resources are used. Second, in some instances FDI can enable developing countries to acquire scarce organisational skills. And finally, the financial and managerial inputs, if effective, naturally bring about greater productivity as they are an important factor in any production process. However, it is important to point out that contextual factors, as well as the nature and content of FDI determine its impact in a given setting, specifically the types of technologies it transfers. Hence, FDI-carrying ESTs in the African context need to be investigated.

## 1.2 THE PROBLEM-IN-CONTEXT

In the African context, as evidenced in national and continental policy documents and development plans, FDI has been recognised as an important mechanism to transfer technologies. However, African policy-makers do not have access to a wide variety of empirical evidence on how to realise the transfer of technologies through FDI. Therefore, African knowledge and understanding of how FDI transfers technologies is rather limited. The problem is compounded even further by the complexities involved in the process of technology transfer. The United Nations Conference on Trade and Development (UNCTAD) states that ñtechnology transfer, in general, includes both ôhardwareô elements, such as machinery and equipment, and ôsoftwareô elements, such as skills, know-how and related organisational and institutional arrangements for the transfer processò (1997: 3). The diversity of technology elements/components raises some questions about whether FDI transfers all these components completely as a once-off, or partially transfers only some of them and excludes others.

Studies on FDI and the transfer of technologies available to African policy-makers have arrived at mixed findings on the efficacy of FDI as a vehicle for transferring technologies. This, therefore, means that they may be of little relevance in providing clear policy directions. In an assessment of available policy literature, Rodrik (1999: 37) concludes that ñé todayôs policy literature is filled with extravagant claims about positive spill-overs from FDI, but the hard evidence is [rather] soberingò. Whilst the World Bank (1993: 1) states that ñmany developing

countries will need to be more effective in attracting FDI flows if they are to close the technology gap with high-income countries, upgrade managerial skills, and develop their export marketsò, Blalock and Gertler (2002: 2) caution that this and other claims that seem to identify multiple positive benefits from FDI ñhave encouraged developing countries to adopt costly programmes, such as tax holidays, subsidised industrial infrastructure, and duty exemptions, to attract multinational enterprisesò. Noteworthy is that these dialectics in the existing policy literature do not necessarily lead to any clear, verifiable proof that can be used in evidence-based policy-making, charting clear-cut directions for technology transfer through FDI.

In addition, policy-makers on the continent are faced with a lack of conceptual frameworks or apparatuses on how exactly FDI transfers technologies. This has caused some policy-makers responsible for negotiating FDI inflows into African countries to adopt a reductionist approach, depending on their training and skills background. For example, if policy-makers have been trained in Economics they would focus on the economic benefits of FDI and not on the other technology-transfer and environmental dimensions. In such cases, the general tendency has been to look at FDI as the flow of capital and not a bundle of resources that affect economies in a multidimensional way, including its effects on the environment and sustainable development.

Whilst there has been a lack of understanding about the efficacy of FDI as a vehicle for transferring technologies on the African continent, there is an even more limited knowledge on how environmentally sound technologies (ESTs) can be transferred through FDI. ESTs, unlike other technologies, exhibit three characteristics that make them peculiar and, therefore, suitable to be studied on their own. First, ESTs are generally designed, developed and diffused with an awareness of their positive impact on the environment, thus necessitating a conscious process of ócenvironmental technological changeô which does not usually apply to other general technologies. Environmental technological change refers to ñnew or modified processes, techniques, practices, systems, and products to avoid or reduce environmental harmsò (Beise and Rennings 2005: 6). This definition broadly encompasses both ócend-of-pipeô and cleaner technologies. Whereas ócend-of-pipeô technologies are devices added at the end of the production process, which allow firms to comply with environmental requirements, do not require changes in production processes, and are relatively easy to purchase and install (Murphy and Gouldson 2000), cleaner production technologies reduce environmentally harmful impacts at the source by substituting or modifying less-clean technologies (Frondel *et al*. 2007).

Second, ESTs can be viewed as suitable for meeting the developmental needs of many developing countries, especially those of Africa, as they reduce harmful effects on the environment. Hence, the successful acquisition and adaptation of ESTs from both external and internal sources, as well as the ability to create new technology, are critical factors in realising the sustainable development of African countries. But as many African countries do not possess national technological capability, it becomes evident that the transfer of ESTs from abroad is the most important potent source for these technologies. As observed by Fabayo (1996: 358), ñthe incapability of the African continent, like the other developing regions of the world to source needed modern technological resources for development and the environment locally, has made dependence on offshore sources inevitableò.

Third, unlike other technologies, the transfer of ESTs is described in, and supported by, certain international instruments. UNCTAD (2001: 2) states that in the area of environmental protection and sustainability some international instruments have imbedded the transfer of ESTs with built-in implementation mechanisms, including the requisite financial provisions and monitoring arrangements. It identifies several international agreements or treaties that have provisions for the transfer of ESTs to developing countries, amongst others, the Vienna Convention for the Protection of the Ozone Layer (1985), the Montreal Protocol on Substances that Deplete the Ozone Layer (1987), the United Nations Framework Convention on Climate Change (UNFCCC, 1992), Agenda 21 of the United Nations Conference on the Environment and Development (UNICED, 1992), and the Kyoto Protocol to the UNFCCC (1997). These international agreements or treaties explain the necessity for both public and private financing mechanisms for the transfer of ESTs. Yet, African countries have overemphasised developing new mechanisms for regulating FDI, instead of fully utilising the existing instruments.

## 1.3 RATIONALE FOR THE STUDY

There are a number of motivations that inform this study.

First, the study aims to demonstrate that FDI is an important channel to transfer ESTs, particularly in the energy sector in Africa. Since ESTs are atypical to other general technologies, the processes and factors of transfer peculiar to them should be viewed from a different vantage point. Generally, existing studies on particular African countries have not systematically examined the processes associated with the transfer of ESTs through FDI. Therefore, this study

is specifically employing case studies of FDI *into* the energy sector of Angola, and FDI *from* the energy sector in South Africa to illustrate how the transfer of ESTs through the vehicle of FDI actually takes place. Angola is chosen as an FDI host country, because it has an extensive energy sector and there is strong government control of this sector, as well as high FDI inflows into the sector. South Africa is chosen as an FDI home country, because it has very high FDI outflows, it is the highest OFDI investor in other African countries, and various studies have positioned it as a technology leader in Africa. The preference for outward FDI is to demonstrate that the home country has certain international obligations to transfer ESTs, as enshrined in international instruments such as Agenda 21 and the UNFCCC.

Second, the study is geared towards developing a conceptual framework that will enable researchers and scholars to view FDI and the transfer of ESTs through a multidimensional prism – to see FDI as a package, serving different purposes. Thus, if FDI is seen as a multidimensional package which is well-governed, it will contribute to environmental sustainability. Also, as this study specifically examines issues of FDI as it relates to environmentally sound technology transfers, a conceptual framework is required that deals with the complexity of geopolitical arrangements, the political economy of technology transfer, as well as international relations. So, approaches that treat technologies in a linear way, or simply reduce FDI to financial capital flows, are likely to distort public policy.

Third, the study aims to demonstrate that, although African countries have for many years been calling for increased FDI, there is no understanding of the role of the state in transferring ESTs. In order to shed more light on the role of the state, the study analyses host and home countries in relation to FDI flows. The Angolan case study is used to highlight that, whilst FDI generally serves as a conduit for transferring ESTs, a conscious, deliberate and active intervention by host countries is of paramount importance in order to facilitate these transfers. In this regard, host states have to apply sovereignty principles of autonomy, control, and international legal recognition (Krasner 2001), resulting in national constitutions that enshrine policies and regulations, as well as agencies for FDI that co-ordinate domestic actors and engage in international relations. Furthermore, the host state may deliberately enact inducements and unwittingly impose distortions on markets, which will result in differential FDI flows. Moreover, the host state may use structural power actively or passively, resulting in different interactions and varying outcomes at domestic and international levels. The South African case study is to

demonstrate that for home countries to promote FDI-carrying ESTs they have to adhere to the obligations imposed on them by international regimes.

Fourth, the study points out that, unlike the current focus of African policy-makers on creating new mechanisms for regulating FDI, existing national policy frameworks and international regimes can be utilised to govern FDI flows.

Fifth, the study is aimed at providing empirical evidence to African policy-makers, which may be used in international negotiations on FDI and the transfer of technologies, including ESTs.

Sixth, the study is an attempt to stimulate new research of an interdisciplinary nature. Implicit is the general concern about the inadequacy of existing theories in explaining FDI and the transfer of ESTs in Africa. The concern is not that the theories are wrong, but that they are deemed to be incomplete and insufficient to reflect African conditions, as well as the interdisciplinary fundamentals of the subject. In contrast to existing theories and literature, this study sees the processes associated with how FDI transfers ESTs to African countries as rather difficult to gauge, thus necessitating the employment of interdisciplinary concepts.

This study, therefore, deploys concepts from international relations (IR), specifically the sub-discipline of international political economy (IPE), and from economics to build a conceptual framework. It deploys IPE approaches, because they enable the study to deal with the role of the state and, in particular, government in regulating FDI, including influencing the content of FDI and managing non-linear processes and activities associated with technology transfer. This assists the study in putting into context the geopolitical and economic conditions of the host country, as well as relations with the home country. It also enables the study to examine the various actors in home and host countries with regard to FDI and the transfer of ESTs. Furthermore, it deploys economics approaches, because they assist the study in dealing with the role of TNCs as entities for EST-carrying FDI (as non-state actors, exerting influences on, and being influenced by, government regulations on FDI), as well as the role of international regimes in the transfer of ESTs.

Thus, economics and IPE concepts are deployed in this study to create a state-centred, institutional, government-imposed distortions (SCIGID) framework. Because this framework is state-centred, it considers sovereign states as *the* actors with the necessary wherewithal to deploy

structural power to actively direct FDI in order to promote the transfer of ESTs. The framework also provides for an analysis of how states define and shape FDI regulations and agencies, and their interactions with international regimes. It employs two levels of analysis: domestic and international. On the domestic front, it provides for firm-level analysis, energy sector-specific analysis, and national-level analysis of FDI regulations and agencies. At the international level, it provides for the examination of interactions between state and non-state actors, and how the state harnesses and domesticates various regional and international FDI regimes. Moreover, the framework enables the study to deal with aspects of content, quality, and volumes of FDI. It provides for the analysis of the form and nature of ESTs, and the processes associated with the transfer of these technologies.

As far as this researcher knows, this conceptual framework has not been applied in the context of FDI in Africa. Therefore, the study seeks to contribute to bringing about conceptual clarity in the discourse on FDI-carrying ESTs in Africa, particularly in South Africa and Angola. Interconnected with this conceptual framework is a research methodology that innovatively includes qualitative, multiple-embedded case studies, built on a triangulation of data from primary and secondary data sources.

## 1.4 THE RESEARCH AIM AND RESEARCH QUESTIONS

The aim of this study is to investigate the transfer of ESTs in Africa as it occurs through the medium of FDI. Two case studies are utilised, from which conclusions are derived, namely Angola and South Africa. One main question simplifies the problem under research. What national and international mechanisms are there for FDI, and how can they be utilised in transferring environmentally sound technologies (ESTs) in Africa?

Subsidiary questions that will guide the analysis are:

(1) What national and international policy or legislative and institutional mechanisms does Angola utilise to regulate FDI inflows to the energy sector?
(2) What national and international policy, legislation and institutional mechanisms does South Africa utilise to govern OFDI to the energy sectors of other African countries?
(3) Is increased FDI flows into Angolaôs energy sector associated with the transfer of ESTs, and has it resulted in such transfers?

(4) Is South Africaôs OFDI associated with the transfer of ESTs into the energy sectors in other African countries, and has it resulted in such transfers?

## 1.5 THE RESEARCH DESIGN AND METHODOLOGY

### 1.5.1 Research Approach and Research Methodology

This study follows a qualitative research approach, defined by Ketokivi and Choi (2014: 233) as an approach that ñexamines concepts in terms of their meaning and interpretation in specific contexts of inquiryò. In qualitative research, ñmeaning is socially constructed by individuals in interaction with their worldò (Merriam 2002: 3). Hence, this study fulfils the four criteria of Marshall and Rossman (1995) for a qualitative study, namely that it is designed to understand processes, describes a poorly understood phenomenon, attempts to indirectly create an understanding on the differences between stated and implemented policies, and assists in discovering unspecified contextual variables.

The studyôs philosophical orientation is based on critical realism, which contains some elements of both positivism and constructivism (Denzin and Lincoln 1994). It ontologically provides a worldview in which an actual social phenomenon can be ascertained even though it is imperfect and probabilistically comprehensible (Merriam 1998). This necessitates the triangulation of various sources of information in order to determine the reality of a social phenomenon (Guba and Lincoln 1994). It also considers knowledge-generation to be a social activity that demands different kinds of reasoning in order to recognise and analyse the various domains of reality and identify, or explain the relationship between experiences, events, and mechanisms (Jeppesen 2005; Pawson and Tilley 2004). Thus, critical realism epistemologically advances that the findings of research are probably true within the limitations posed by the value-laden nature of the research process itself. This approach has been adopted for this study because it helps to identify, describe, analyse, and unravel the complex research phenomenon of FDI-carrying ESTs, which has not been fully comprehended by the utilisation of a qualitative, multiple-embedded case study methodology.

The methodology employed here, which refers to the procedure carried out by a researcher to explore reality (Guba and Lincoln 1994; Parkhe 1993), is that of a case study methodology, encompassing a ñsystematic investigation of a unit of analysis that is conducted over a period of

time [and] where in-depth data is obtainedò (Walsh *et al*. 2000). Whereas Yin (2003) defines a case study as ñan empirical inquiry that investigates contemporary phenomena within its real-life context, especially when the boundaries between phenomena and context are not clearly evidentò, Benbasat and others (1987) observe that it involves information-gathering from a few entities (people, groups, organisations).

This study specifically utilises qualitative, multiple-embedded case study methodology, whereby more than one case study is employed to analyse a single phenomenon within a particular case study, as well as further entrenching some case studies within the main case studies. In this regard, Angola is examined as a host country for inward foreign direct investment (IFDI). Thus, the study examines FDI from other countries, flowing into Angolaôs energy sector in relation to the transfer of ESTs. Following a sector-level analysis, a firm-level case study that has been selected to demonstrate the transfer of ESTs is based on Angolaôs liquefied natural gas (LNG), with operations and activities in Soyo (in the Zaire Province). On the other hand, South Africa is examined as a home country to FDI. As such, the study analyses outward foreign direct investment (OFDI) from South Africaôs energy sector in relation to the transfer of ESTs to host countries. The firm-level case study of Eskom Uganda Ltd charts a discourse on the transfer of ESTs into Uganda, specifically focusing on the Nalubaale and Kiira hydro-power stations at Jinja.

There are several reasons for employing this qualitative, multiple-embedded case study methodology. First, there is scant data on the subject being studied; therefore, information had to be systematically collected and built upon in order to fill the information lacuna. Second, this methodology offers depth and detail of empirical material through description. And finally, the methodology enables the development of a particular set of propositions on FDI and the transfer of ESTs that can be tested in real policy situations.

The study utilised focused sampling procedures. In this regard, the most productive sample to answer the research question was selected, based on the researcherôs practical knowledge of the research area and the available literature (Marshall 1996). The two country case studies were selected because of the high volumes of FDI (IFDI in the case of Angola, and OFDI in the case of South Africa), the regulatory approach to FDI that these countries employ, and the researcherôs personal and professional experience gained through living in these two countries, which facilitated the creation of networks that would ease data collection and analysis.

As per these focused sampling procedures, clear criteria for selecting institutions to participate in the study were created. For the purpose of inclusion, government departments had to be directly or indirectly involved in providing oversight on FDI and articulating FDI issues at domestic and international levels. The first key interviewees from government departments were conveniently sampled. Thus, the most accessible officials to kick-start the interview process were selected. From this point onwards, a snowballing technique was used in order to gain further access to key government-based interviewees.

Similar focused sampling was applied to the selection of TNCs for participation in the study. For the Angolan case study, an elaborate set of inclusion criteria was developed, which encompassed that TNCs (1) should have their headquarters situated outside of Angola, (2) have subsidiaries operating in the energy sector inside Angola, and (3) should make their reports accessible for review. Thus, using these inclusion criteria, the Angolan LNG project was purposefully selected. Furthermore, key interviewees were also purposefully selected, based on the criteria that they (1) should be working directly on the Angolan LNG project, (2) be able to explain its ownership structure, (3) be capable of discussing environmental issues relating to the project, (4) understand technology and technology-transfer issues pertaining to the project, and (5) be proficient in articulating ESTs and EST-transfer issues. Once the first key interviewees in the Angolan LNG project were identified, they provided the contact details of other persons in other departments who could be interviewed, and these leads were then followed up. However, some persons who were not referred were also interviewed so as to verify some facts and minimise biases that could possibly have arisen from a snowballing effect.

Focused sampling was also employed to select South African TNCs to be included in the study, again based on certain inclusion criteria which required that firms (1) have their headquarters operating in the energy sector inside South Africa, (2) have subsidiaries operating in the energy sector outside South Africa, and (3) make their reports accessible for review. Based on these criteria, Eskom Enterprises and Eskom Uganda Ltd were purposefully selected. Again, key interviewees from these firms were purposefully selected, based on the criteria that they (1) should have knowledge gained through working in any of the two entities, (2) be able to explain ownership structures, (3) be capable of discussing environmental issues relating to direct investments by these firms, (4) understand technology and technology-transfer issues pertaining to these firms, and (5) be proficient in articulating ESTs and EST-transfer issues. As in the case

of the Angolan TNCs, these key interviewees provided the contact details of other persons in other departments who could be interviewed, and these leads were again followed up.

The data-collection process involved primary and secondary sources, as well as interviews. Primary sources provided direct or first-hand evidence (written and non-written) about FDI and the transfer of ESTs at the national, sector, and firm levels. Examples of primary sources reviewed include (1) company memos and correspondence, (2) written speeches, (3) some audio and video recordings, especially on the Angolan LNG project, (4) photographs, (5) newspaper reports, (6) legislation and legislative hearings, (7) policy documents, (8) company and government department audit reports, (9) company reports, (10) monitoring and evaluation reports, (11) blueprints and plant designs, (12) project funding announcements and notices, and (13) public opinion polls. These were acquired from officials working in firms or government departments, and from company and government websites. Data collection for primary sources mainly involved writing to, or directly calling and asking for data and information from consultants, firms, and government employees.

Naturally, secondary sources were also utilised, which are indirect materials that contain information that has been interpreted, commented upon, analysed, or processed in such a way that it no longer conveys the freshness of the original. These included (1) books on FDI, ESTs and technology transfer, the international politics of the environment, international technology transfer, (2) published peer-reviewed journal articles on FDI, ESTs and technology transfer, (3) minutes and proceedings of UN conferences, (4) minutes and proceedings of conferences of parties (COPs), (5) UNCTAD, United Nations Environment Programme (UNEP), and United Nations Industrial Development Organisation (UNIDO) reports on FDI, technology transfer, the environment and ESTs, and (6) reports on FDI, ESTs, the environment and energy from non-governmental organisations (NGOs) and voluntary regulatory bodies.

Data were also gathered through structured discussions with 107 key interviewees, divided into 57 interviews conducted in South Africa and 50 interviews in Angola. The interviews conducted with government officials, members of intergovernmental organisations, NGOs, domestic and international firms were focused at the international, the national, the sector, and the firm levels. Interview-guiding questionnaires in Appendixes A, B, C and D were utilised to capture data during discussions and through correspondence. These interviews were conducted by way of face-to-face meetings, telephone calls, and email correspondence, as detailed in Appendix G.

Data were processed manually. In terms of secondary data, theme-based summary sheets of triangulated data that were archived were analysed by reviewers, who pointed to gaps in the data, to conflicting data, and to areas that they thought a saturation point was not reached. In terms of areas where data were perceived not to be saturated, these were stressed during the interview process. Naturally, conflicting data were discarded. Naturally, data from interviews were manually analysed through note-taking (subsequently, classified thematically and summarised) during all discussions, and from e-mail correspondence.

### 1.5.2 Limitations of the Study

There are a number of limitations to this study. First, it did not involve non-probability sampling and, therefore, generalisations that could be made about the findings are rather limited. However, this researcher was aware of these constraints and has avoided generalisations as far as possible, while providing underlying conditions and factors when generalisations had to be made. Bias was also a potential problem and in order to address this, summaries of findings were sent to the interviewees, as well as to reviewers. This process created a measure of checks and balances on the interpretation of information gathered. Verifying some of the primary and secondary sources proved quite difficult, especially in cases where there was a conflict of data. Conflicting data that could not be verified, especially if it came from unpublished institutional reports, was not included in the analysis or utilised in the study.

Another limitation was the paucity of information on FDI activities in the energy sectors in both Angola and South Africa, while there was an even greater lack of information on ESTs in both countries. In order to address this limitation, this researcher had to rely on primary sources of information, in particular information provided by interviewees during discussions.

Finally, the study focused on only two African case studies, which is a rather limited sample. However, in some instances, the study tended to extrapolate findings from these particular case studies to the rest of Africa. Again, this researcher was well aware that there are 52 other African countries, representing a heterogeneous continent and, therefore, such generalisations might not always be valid.

## 1.6 SIGNIFICANCE OF THE STUDY AND CONTRIBUTION TO KNOWLEDGE

The aim of this study is to enlarge the body of knowledge on the relationship between FDI and the transfer of ESTs. It will generate new knowledge and empirical evidence that will be useful for public policy-making in Angola and South Africa (the two case studies) and African countries, in general. To a large extent, this research is of a policy-science nature and aims to address real world problems. It therefore does not dwell on framing research hypotheses. In this regard, the research is of great significance and contributes to knowledge in a number of ways.

First, the study is important because it utilises theories and concepts from different disciplines to explain FDI and the transfer of ESTs. This interdisciplinary approach allows the study to deal with the relevant issues in a more holistic way and avoid reductionism. As alluded to by scholars such as Nicolescu (2002) and Mobjörk (2009), an interdisciplinary approach permits this research to venture beyond the boundaries of traditional disciplines and fields of practice in pursuit of the connections of knowledge óformsô and methods. This enables policy-makers, academics and practitioners with access to the findings of this research to gain a holistic understanding of FDI as a medium of transferring ESTs.

Second, the study establishes a clear conceptual framework for investigating the links between FDI and the transfer of ESTs, more specifically FDI functioning as a channel for the transfer of ESTs, or serving as a carrier of ESTs. More importantly, in this regard the study contributes to new knowledge by creating a unique conceptual framework and methodology for the transfer of ESTs through FDI. To this researcherôs knowledge, this conceptual framework and methodology has not been utilised in other studies that have examined FDI, in particular in the African context. By doing so, the study strengthens the theoretical base and methodological framework on FDI-carrying ESTs.

Third, the study makes a contribution to empirical research. Various scholars have written about the need for greater understanding and knowledge on an empirical and practical level in which future policies could be grounded (Muchie & Baskaran 2009; Nelson 2007). Viewed from that angle, this is a policy-science study that deals with FDI policies and institutions in the African context. It contributes to the generation of quality policies on FDI and the transfer of technologies, in general, and the transfer of ESTs, in particular. Africa, with its pressing developmental needs, is extremely reliant on FDI and ESTs for long-term sustainability. Much

more empirical research (such as this thesis) is needed to inform policy processes and developmental strategies, not just for individual governments but also for intergovernmental and other institutions that advise them.

Fourth, studies on FDI and technology transfer have tended to be guided by ideological predispositions around the North-South divide. Yet, the relationship between FDI and the transfer of ESTs is rather complex and should rise above a North-South discourse on these matters. Thus, this study attempts to move beyond the usual North-South posturing and charts a perspective that includes the South-South transfer of technology.

Fifth, African countries are currently preoccupied with the identification of ways and means of transferring ESTs to address their pressing developmental challenges. But they still lack conceptual and empirical data that would enable them to effectively engage in international negotiations on climate change and technology transfer. This study brings a relatively rich body of empirical information to international researchers on climate change and technology transfer that should enable them to reach appropriate policy positions.

Finally, through a critical literature review, this study points to gaps in the existing literature and interprets some findings and conclusions, thereby enlarging the available body of knowledge. It ultimately maps out some future areas of study on this theme –hence, laying the foundation for future ground-breaking research to be conducted on this topic.

## 1.7 STRUCTURE OF THE RESEARCH

This study is divided into eight chapters. Chapter 1 introduces the theme by highlighting the background and objectives of the study, the research questions, the research methodology, and the thesis outline. Chapter 2 provides definitions of key concepts, highlights the theories on FDI and the transfer of ESTs, and also justifies the necessity of a conceptual framework for the study. Chapter 3 outlines the studyôs conceptual framework, starting by showing how the study of FDI and the transfer of ESTs have been treated in the fields of economics and international relations. Drawing from these two disciplines, a SCIGID framework is then constructed as a guide to the analysis of FDI and the transfer ESTs. Chapter 4 provides an overview of how African states direct IFDI towards economic change in their countries. Chapter 5 presents a case study of Angola in the areas of FDI and ESTs transfers, with FDI flowing inward (IFDI). Chapter 6

presents a case study of South Africa in the areas of FDI and the transfer of ESTs, with FDI flowing outward (OFDI). Chapter 7 takes a comparative look at the two case studies and details implications for policy-making and implementation. Chapter 8 concludes the thesis and offers proposals for a further research agenda.

# CHAPTER 2: LITERATURE REVIEW AND THE LOGIC FOR A CONCEPTUAL FRAMEWORK

## 2.1 INTRODUCTION

In order to investigate the research questions that guides this study, it is necessary to explore the theoretical perspectives on FDI and the transfer of ESTs. This chapter will, therefore, commence with a conceptual clarification of these key concepts, including an analysis of the types and classifications of FDI, particularly definitions of technology and ESTs, and a discussion of the classifications, modes and channels of, and mechanisms for, the transfer of technology. This will be followed by an analysis of the crucial nexus between FDI and technology transfer. In this regard, the processes underlying FDI and technology transfer will be discussed, highlighting host as opposed to home country features, followed by a section dealing with the new discourse on FDI and the environment, specifically concerning the transfer of ESTs. The chapterôs main purpose is to try and locate the study in the current literature. It specifically highlights that although current literature on FDI and the transfer of ESTs is rich and diverse, it has not provided much insight from an African perspective and, in fact, has relegated to the periphery the important role of the African state.

## 2.2 KEY CONCEPTS DEFINED: FDI, TECHNOLOGY TRANSFER, AND ESTs

### 2.2.1 Foreign Direct Investment (FDI)

#### *2.2.1.1 Definitions of FDI*

This study uses the benchmark definition of FDI provided by two international institutions, the International Monetary Fund (IMF) and the OECD. According to the OECD (2008):

> é direct investment is a category of cross-border investment made by a resident in one economy (the direct investor) with the objective of establishing a lasting interest in an enterprise (the direct investment enterprise) that is resident in an economy other than that of the direct investor. The motivation of the direct investor is a strategic long-term relationship with the direct investment enterprise to ensure a significant degree of influence by the direct investor in the management of the direct investment enterprise. The ólasting interestô is evidenced when the direct investor owns at least 10% of the voting power of the direct

> investment enterprise. Direct investment may also allow the direct investor to gain access to the economy of the direct investment enterprise which it might otherwise be unable to do.

This definition highlights that FDI involves the direct investor having an effective lasting voice in the management of the foreign enterprise invested in; hence, FDI capacitates the direct investor to influence managerial decisions in the invested entity. This influence is limited and does not imply absolute control of the entity, but a certain amount of share equity (at least 10 per cent) that allows for voting and the exercise of ownership and management rights.

The IMF Balance of Payments Manual (2009) offers a similar definition, but adds that:

> é as well as the equity that gives rise to control or influence, direct investment also includes investment associated with that relationship, including investment in indirectly influenced or controlled enterprises, investment in fellow enterprises, debt (except selected debt), and reverse investment.

The IMF definition shows that FDI is comprised of three important components: a) equity capital, which allows the acquisition of shares by the foreign direct investor in an enterprise in a foreign host economy; b) reinvested earnings, which entail the investorôs share of profits that are not paid to that investor, but reinvested; and c) intra-company loans or debt transactions, which include long-term and short-term borrowing and lending transactions between the direct investor and its foreign subsidiary enterprise in that host country.

#### *2.2.1.2 Types and Classification of FDI*

FDI can be classified according to the following main criteria: whether it is accumulated over time or as a current flow of funds, the direction of fund flows, the mode of entry, and the rationale for making foreign investment (Ajala 2010; Bezuidenhout 2007).

When FDI is accumulated over time, the net worth of the accumulated total is referred to as FDI stock. FDI flows are the funds that flow from one country to another in an FDI transaction (IMF 2009; OECD 2008; Bezuidenhout 2007; Sachwald 2005; Alfaro 2003; Dahl 2002). FDI can also be classified according to the direction of fund flows, either inward (IFDI) or outward (OFDI). IFDI is the FDI received by the host country during an investment, or the accumulation of net inward FDI stock. OFDI, on the other hand, is FDI that flows from the home country, or the accumulation of outward FDI stock (Bezuidenhout 2007: 32). The mode of entry criterion

classifies FDI based on whether a current enterprise is taken over, or a new enterprise is established as either a merger or an acquisition (Bezuidenhout 2007; UNCTAD 2005; OECD 2005 and 2002). Under this criterion, FDI can be classified into greenfield investment and brownfield investment. Whilst greenfield investment entails the establishment of a new venture, subsidiary or firm in a foreign host country by complying with the relevant laws and requirements of that host country, brownfield investment involves the acquisition of a sufficient controlling share in an existing firm in a foreign host country (Ajala 2010). Finally, FDI can also be classified according to the rationale for making foreign investment. This entails understanding the underlying motives behind the investment, particularly whether the parent company seeks resources or market share. In this regard, FDI can be classified as resource-seeking, market-seeking, efficiency-seeking, and strategic asset or capability-seeking (Ajala 2010; Dunning and Lundan 2008).

Resource-seeking FDI (also known as vertical FDI) occurs when a foreign investor invests in a host country in order to obtain cheaper inputs or extra resources for production at a low cost. Through vertical FDI, the investor exploits factor-endowment differences across international borders in order to benefit from cheaper inputs and, thus, to increase outputs (Bezuidenhout 2007; Sachwald 2005; Slaughter 2002). Market-seeking FDI, also referred to as horizontal FDI, occurs when a parent company invests abroad to acquire a share of the host countryôs own and regional markets. Through horizontal FDI, duplicate production processes can be established in that host country (Dunning and Lundan 2008; Bezuidenhout 2007; Sachwald 2005; Slaughter 2002). Efficiency-seeking FDI occurs with the aim of maximising profits and minimising costs through efficiency gains for the direct investor. It takes place in countries that provide factors of production cheaply, besides other pull factors, such as good infrastructure, cheap but trained human capital, lower taxes, and laws conducive to the repatriation of profits. The long-term objectives of a foreign investor are central to strategic asset-seeking FDI, which occurs when a foreign direct investor acquires a foreign entity, not for immediate profit or gain but for long-term strategic purposes (Ajala 2010; Dunning and Lundan 2008).

### 2.2.2 Technology and the Transfer of ESTs

#### *2.2.2.1 Definitions of Technology*

Although the term ótechnologyô is widely being used, it means different things to different people, and in some instances it describes a rather abstract concept. Quite often the terms

ótechnologyô and óknowledgeô are used interchangeably. However, in the context of this research, Sawadaôs (2005) description of technology, which includes product design, process design, production design, and management techniques (such as production management, research and development, marketing and sales management, supply chain management, and other techniques), will be used as an operational definition. It also embraces Stewartôs (1977) definition of technology as ñall skills, knowledge and procedures required for making, using, and doing useful things. Technology, therefore, includes the software of production –managerial and marketing skills, and extends to services administration, health, education, and finance.ò Through this definition, technology is understood to encompass either tangible goods or products, such as machinery, or tacit information, such as skills and knowledge (Szogs 2010; Gallagher 2003; Grubler 1998).

#### *2.2.2.2 Definitions of Environmentally Sound Technologies*

Within the generality of technology there is a sub-set known as environmentally sound technologies (ESTs). The UNôs Agenda 21 (Article 34, Paragraphs 1-3) of 1992 states that ESTs encompass all technologies with a significantly improved environmental performance when compared to others, and also utilise resources in a more sustainable manner. It then elaborates that:

> é environmentally sound technologies, in the context of pollution, are process and product technologies that generate low or no waste for the prevention of pollution. They also cover end-of-pipe technologies for treatment of pollution after it has been generated.

The definition of ESTs espoused in Agenda 21 alludes to the fact that all technologies can be environmentally sound, depending on how they are produced and the context in which they are applied. It also implies that the environmental soundness of a technology should be considered in relation to the full cycle flow of materials, energy and water in the consumption and production process. Furthermore, it captures the features of technology development in a social and ecological context. By alluding to pollution reduction, the definition zeroes in on closed-system technologies, whose main goal is zero waste, or a significant reduction in resources usage as compared to environmental technologies that may result in high emissions and high resources usage. Finally, it covers the full spectrum from basic technologies that are adjunct to the production process, to fully integrated technologies where the environmental system is the production of technology itself.

### *2.2.2.3 Definitions of Technology Transfer*

The term ótechnology transferô can be defined as the process whereby movement of technology from one entity to another occurs (Ramanathan 1994; Souder *et al*. 1990). It can take place domestically from one firm or sector to another, and also across national boundaries ï thus, from one country to another. Such international technology transfer is defined by Fransman (1986) as a process ñwhereby knowledge relating to the transformation of inputs into outputs is acquired by entities within a country from sources outside that countryò. In general, technology transfer may be said to be successful if the receiving entity, the transferee, can effectively utilise the technology transferred and eventually assimilate it (Ramanathan 1994). A thought-provoking feature of the definition of technology transfer is provided by Stewart and Nihei (1987) who state that it is ñthe utilisation of an existing technique in an instance where it has not previously been usedò. This implies that technology transfer is not limited to the deployment of new or novel technology, as old and traditional technology can also be transferred.

Whereas, in general parlance, technology transfer is mainly associated with the transfer of machinery or equipment, Derakhshani (1983) notes that it can also imply ñthe acquisition, development and utilisation of technological knowledge by a country other than that in which this knowledge originatedò. This definition is similar to that of Van Gigch (1978), who argues that technology transfer involves the acquisition of inventive activity by secondary users. These two definitions place an emphasis on the transfer of knowledge, an element that can be transferred ñthrough education and training, which could include training on how to effectively manage technological processes and changeò (Jafarieh 2001: 13). In addition, the technology transfer process encompasses ñtechnological capacity-building, which includes knowledge and skills that firms need in order to acquire, assimilate, use, adapt, change and create technologyò (UNCTAD 1997: 4).

In this study, technology transfer is viewed as a process of communication, education, capacity-building and learning (Gallagher 2003; Martinot, Sinton and Haddad 1997; Chen 1996). It is a dynamic process which requires an adequate infrastructure, including scientific institutions, research and development (R&D) facilities, and vocational, technical and management institutes, as well as skilled personnel of different specialisations, within a recipient country. It also requires a suitable cultural environment and an ability to modify the transferred technology to fit new

environments. It contains many components, elements and dimensions which are always in constant interaction ï thus, constituting a system.

### *2.2.2.4 Technology Transfer Classifications*

Different criteria are utilised to classify technology transfer. Mansfield (1982), for example, distinguishes between material transfer, design transfer, and capacity transfer, while Bell (1990) identifies three distinct flows of transferable technology ranging from Flow A to Flow C, all generally highlighting the transfer of capital, blueprints, and expertise. Flow A concerns the transfer of capital goods, services and design specifications. This mainly refers to hardware or machinery and equipment, which is acquired and brought into operation during investment projects. Achanda and Gosch (1994: 163) note that ñthe flow of capital goods and services adds to the production capacity of the transferee or, in the case of equipment designs, provides domestic capital-goods producers with specifications for setting up similar facilitiesò. Flow B is concerned with the transfer of skills and know-how for production. There are two main components constituting Flow B, namely paper-embodied technology and people-embodied technology. The latter refers to knowledge and expertise required to carry out procedures, including staff skills-training and know-how required to operate and maintain new or improved production facilities. Paper-embodied technology is in the form of manuals, schedules, flow charts, including operating procedures, maintenance and repair procedures. In Bellôs (1990) classification, Flow C concerns the transfer of technology in the form of knowledge and expertise for generating and managing technical change. This is ôknow-whyô technology and is mainly concerned with changing technical systems.

In Mansfieldôs (1982) distinction, material transfer consists of the transfer of materials, final products, equipment, components, parts and turnkey plants, with the recipient usually a passive consumer. On the other hand, design transfer involves the movement of blueprints, know-how and designs to manufacture previously designed products or equipment ï thus, basic information, data and guidelines needed to produce these products are shared. In some instances, a firm may buy an item, copy its designs, and then start producing it for the domestic market. As in material transfer, design transfer utilises technological knowledge produced somewhere else. As far as capacity transfer is concerned, Mansfield (1982) stresses that it involves the provision of know-how and software for innovation purposes, which enables the recipient to analyse and modify existing products and to, ultimately, design new products.

Besides the classification made by Mansfield (1982) and Bell (1990), another classification distinguishes between two basic technology transfer processes, namely vertical transfer and horizontal transfer. The latter applies to technology that is used in one place, firm or context, and then gets transferred or used in another setting. Vertical transfer refers to the process by which science is converted into a technology, denoting the continuum from research to applied research, applied research to product development, and from product development to production (Jafarieh 2001).

### *2.2.2.5 Mechanisms, Channels and Modes of Technology Transfer*

There are several dimensions to the process of technology transfer: mechanisms, channels, and modes. Technology transfer mechanisms can be defined as ñany specific form of interaction between two or more social entities during which technology is transferredò, while a ñtechnological channel is the link between two or more social entities in which the various technology transfer mechanisms can be activatedò (Radosevic 1999). Modes of technology transfer are defined as ñthe transfer of systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service, and does not extend to the transactions involving the é sale or lease of goodsò (Jafarieh 2001: 18). However, it is quite difficult to separate the mechanisms from channels of technology transfer ï thus, these concepts will be used interchangeably in this study.

In terms of technology transfer mechanisms, Cooper and Sercovich (1971) and Stewart (1979) elaborate on direct and indirect mechanisms of technology transfer, while Olukoshi (1989) discusses international technology transfer mechanisms in relation to embodied and disembodied technology. A direct mechanism of technology transfer involves the direct interaction between a technology recipient and the technology source. At times, it involves individual experts and consultant companies that are directly contracted to design and develop a plant, and further train local staff. Furthermore, it may take place when a firm directly imports a technology from the technology source. In contrast, indirect mechanisms of technology transfer involve an arms-length relationship between a technology recipient and the technology source, and may involve some intermediaries.

Olukoshi (1989) notes that international technology transfer channels include (1) the flow of information in journals, books and other publications, (2) migrations and movements of people between countries through immigration, (3) return emigration, (4) study visits and foreign

courses, (5) the acquiring of machinery and equipment for production, and (6) the importation of consumer goods. For him, each of the above channels contains elements of embodied and disembodied technology, or a complex combination of both. To exemplify this, the flow of information through journals is a means of transferring disembodied technology, whilst the sale of licences, patents and trademarks are an embodied form of technology. The supply of machinery may be considered a complex combination of embodied and disembodied technology transfer, as it involves the transfer of machinery (embodied technology) and technical services (disembodied technology).

Concerning modes of technology transfer, Buckley (1985) differentiates between internal and external technology transfer. Internal modes of technology transfer take place within the entity and is internalised to affiliates under the ownership and control of the investing entity (UNCTAD 2001; 1999). Furthermore, ñinternal modes of technology transfer take the form of direct investment and are, by definition, the preserve of TNCsò (UNCTAD 2001: 12). On the other hand, external modes of technology transfer occur when other external firms, or firms non-affiliated to the technology generator or proprietor, are involved. These can manifest themselves as minority joint ventures, capital-goods sales, franchising, technical assistance, subcontracting, licencing, or original equipment manufacturing arrangements. According to UNCTAD (2001: 12), purely national firms can also use these means to supply technology. Thus, these means are not exclusive to TNCs.

Even though modes of technology transfer processes include internal and external forms, UNCTAD (2001: 12) has pointed out that:

> é the trend towards the forging of strategic alliances between competing firms for the development and application of new technologies has created networks within which technology is transferred, and has tended to blur the distinction between internalised and externalised technology transfer.

Tho (1993) has pointed to another dimension that distinguishes between private and public channels of technology transfer. The former are related to technologies developed by private firms and transferred on a commercial basis, mainly through TNCs and, especially, by way of FDI. Public channels of technology transfer relate to technologies produced by governments and international institutions. They include the use of international agreements, technical assistance, and economic co-operation.

On a similar note, Erdilec and Rapoport (1985) refer to formal (market-mediated) and informal (non-market-mediated) channels of technology transfer, while Kim (1991) analyses market and non-market-mediated technology transfer in terms of mechanisms. For Erdilec and Rapoport, formal channels of technology transfer are FDI, licensing agreements, the sale of turnkey plants, and joint ventures, whereas informal channels are those that do not involve any formal agreement between the supplier of technology and the receiver of technology. Informal channels include the exportation of high-technology products, reverse engineering, science and technology conferences, trade shows and exhibits, open literature, and even industrial espionage. Whilst formal channels are easy to monitor and detect, informal channels are riddled with monitoring and detection challenges.

Kimôs (1991) analysis, therefore, departs from Erdilec and Rapoportôs (1985) by focusing on mechanisms that can be determined by the market. The technology source and technology recipient in market-mediated mechanisms can negotiate and enter into an agreement on the cost of transfer embodied in, or disembodied from, the physical equipment. In this kind of transfer mechanism, no payment or formal agreement is necessary for the transfer of technology. Moreover, market-mediated mechanisms of technology transfer involve made-to-order machinery, foreign licensing, and FDI.

Although there are many channels through which technology transfer occurs, FDI percolates through most discussions on channels, modes and mechanisms for technology transfer. This justifies the detailed analysis of FDI and technology transfer provided in the next section.

## 2.3 THE FDI-TECHNOLOGY TRANSFER NEXUS

### 2.3.1 A Complex Discourse

The existing literature and theories on FDI mainly deal with uni-directional flows of FDI from a home country to a host country. Emphasis is thus placed on the impact of FDI on host countries, barriers to FDI, and policies that promote it. The complexity of analysing FDI and technology transfer arises when a departure is made from a linear analysis to an analysis of a much more potent combination, which looks at FDI and technology transfer from the perspective of both host and home country. Literature and methodology that combine the two different sets of

country – home and host (FDI inflows and FDI outflows) –in a simple and clear manner are quite limited. This study is among the few which attempt to do this.

There are two important points on FDI and technology transfer that have to be stated at the outset. First, the complex process of FDI and technology transfer can generally be viewed as a two-stage process. The first of these involves the transfer of technologies from a home country to a host country ï thus, between parent firms and their subsidiaries or affiliates located in a different host country. The second stage comprises of the transfer of technologies from foreign affiliates located in the host country to domestic firms located within the host country.

Second, FDI and technology transfer can be viewed from two different vantage points, which are deliberately classified as traditional and contemporary. Traditional discourses regard or conceptualise technology transfer as a uni-directional process involving the transfer of technologies from the global North to the global South – that is, from firms located in developed countries to firms in developing countries. FDI is, therefore, undertaken by TNCs mainly headquartered in the global North, with most of their R&D activities taking place where the parent companies are located, rather than in the global South where their affiliates are based. Franco and Carvalho (2004: 17) cite evidence that TNCs ñconcentrate their main technological efforts in their home, developed countriesò, where there are developed infrastructures for R&D. Based on this traditional discourse, developing countries are users of existing technologies from the global North, rather than inventors or innovators themselves.

Recent studies provide a contemporary perspective on technology transfer, including South-South technology transfers and South-North technology transfers. Expanding on this contemporary angle, Lall (1980: 25) states that:

> é the evidence, whilst scattered and incomplete, points to a clear trend: the most industrialised of the developing countries have experienced a considerable measure of technological progress in recent years and have now developed the capability to generate and transfer a large range of industrial technologies.

In the same vein, Mugabe (2012: 20) critiqued the traditional discourses on technology transfer and pointed out that:

> é the traditional North-South paradigm of technology transfer ignores the increasing importance of developing countries as source[s] of advanced climate-friendly technologies,

and therefore ignores South-North and South-South transfers. Further, whereas the North-South paradigm has emphasised developing countriesô intellectual property rights policies as barriers to technology transfers, the global paradigm focuses attention on trade and investment policy barriers, including developed countriesô policies that inhibit technology transfer from developing countries.

### 2.3.2 The Processes of FDI and Technology Transfer

It is generally acknowledged that technology transfer is a component of FDI (Bell 1990). Less and McMillan (2005) also comments that ñtechnology transfer through FDI generates benefits that are unavailable when using other modes of transferò. In general, FDI can contribute to the transfer of technology in host and home countries, directly or indirectly, through spill-overs effects and other processes. The next section discusses the conditions for, and the effects of, FDI and technology transfer on host countries, which are termed FDI-inflow countries. The following section analyses the conditions for, and the effects of, FDI and technology transfer from a home country perspective, which are termed FDI-outflow countries.

#### *2.3.2.1 FDI and Technology Transfer: Host Country Conditions and Effects*

As already stated above, FDI is very important for the development of a host country. It conveys technology embodied in goods and intangible assets, as well as imparting organisational skills. These beneficial effects of FDI have been documented by scholars such as Kinoshita (2000). But for the host country to reap the benefits of FDI there must be certain pre-existing conditions. First, the country must have some minimal endogenous technological capabilities to be able to acquire, absorb and utilise both tangible and intangible technology components transferred through FDI. Second, there must be existing firms or enterprises that will absorb and further develop any FDI transferred technologies. Third, the socio-political environment of the host country should be favourable for foreign investments, particularly by private firms or enterprises. Fourth, FDI inflows are usually attracted to the natural resources endowment of the host country such as minerals, oil, and gas. Fifth, the host country should have good infrastructure. And last, FDI flows are often facilitated by the host country having good relations with the home country. Therefore, the foreign policy or international relations of the host country in no small measure influence FDI inflows, in general, and the content of FDI, in particular.

On the effects of the host country on FDI, Kinoshita (2000: 5) states that:

> FDI is assumed to be one of the most effective forms of international technology transfer to [a] host economy because, in contrast to other international technology transfer channels, it conveys both technology embodied in goods and services é [and also in the] form of intangible assets such as organisational and management [skills].

In light of this, Myer (2003) observes that some types of technology are codified in blueprints or embodied in machinery, and can readily be applied to the host economy. However, Jindra (2004: 11) cautions that it is more difficult to ñtransfer more complex capabilities such as skillsò and to select the most suitable capacities, or the managerial skills that improve organisational arrangements, as ñsuch capabilities are often tacit and reside [not] only within the firm, but also in its environmentò. In general, there are four processes that are linked to FDI and technology transfer through spill-over effects on the host country, namely vertical linkages, horizontal linkages, labour migration and the internationalisation of research, and experimental research development (R&D).

(1) FDI Vertical Linkages and Technology Transfer

The process of FDI vertical linkages and technology transfers involve TNCs passing on technology to firms that supply them with intermediate goods, or to buyers of their own products (OECD 2002). Blomström and Kokko (2002) elaborate that vertical technology transfers along the supply chain can either be through forward or backward linkages. According to Liu and others (2009: 1115) ñé backward linkages exist when foreign firms acquire goods and services from firms in upstream industriesò. They may contribute to the upgrading of local firms, and embed foreign firms more firmly in host economies (UNCTAD 2001). There are two reasons why technologies may be transferred through backward linkages, namely TNCs may benefit from improved performance by intermediate input suppliers, through enhanced efficiencies and the superior quality of their products (Javorcik 2004), and TNCs may encourage suppliers to realise benefits associated with higher outputs and economies of scale (Lin and Saggi 2005). Therefore, positive productivity spill-over effects are expected from backward linkages. Keller (2010: 814) reports that Javorcikôs study among domestic firms in Lithuania in the late 1990s found that firms that were ñupstream to industries which experienced a relatively strong inflow of FDI é [had] systematically higher productivity than other domestic firmsò. Similar findings were also noted by Blalock and Gertler (2008) in the context of Indonesian firms. Further confirmation of the existence of positive backward linkages from FDI is provided by the

econometric studies of Blalock and Gertler (2008), Driffield and others (2002), Moran (1998), and Lall (1980).

However, some of the conducted studies do not paint a very positive picture. Lin and Saggi (2005) argue that there are two conflicting ways in which FDI can affect the degree of backward linkages: when demand for intermediate products is created (known as the ódemand effectô), and when local firms competing with foreign firms are forced ñto reduce their output and, hence, their own demand for é [these] intermediate productsò (known as the ócompetition effectô). This led Liu and others (2009: 1115) to conclude that ñif the competition effect exceeds the demand effect, there will be net negative backward linkage effectsò. Some sketchy evidence that there are negative spill-over effects in developing countries, as local suppliers cannot comply with the higher standards and grading requirements for supplied products, has been provided by authors such as Dries and Swinnen (2004), Weatherspoon and Reardon (2003), and Dolan and Humphrey (2000).

Apart from backward linkages there are also forward linkages which, according to Liu and others (2009: 1115), arise ñwhen foreign firms sell goods and services to local firmsò. Some authors, such as Reuber and others (1973) and Blomström and Kokko (1998), argue that forward linkages may contribute to the development of local distribution and sales organisations. Furthermore, Dries and Swinnen (2004), Key and Runsten (1999) and Gow and Swinnen (1998) note that these forward linkages may also facilitate the adoption of new technologies, and may solve contract enforcement problems. Unlike the many empirical studies on backward linkages, there is little empirical work that has been done on FDI and forward linkages in the transfer of technology. However, Liu and others (2009) have documented cases of positive productivity spill-over effects via forward linkages, as have Driffield and others (2002) in their studies on local firms in the United Kingdom (UK).

The studies that have explored forward and backward linkages have assumed that FDI do indeed transfer technologies. This means that they start from a predetermined hypothesis, and then move on to gather evidence to support or refute forward or backward transfer of technologies. Such studies lack an analysis of the condition in which FDI can serve as a catalyst for backward and forward linkages. Thus, these studies do not explicitly explain the national, sector or firm-level conditions that promote the existence of forward or backward linkages. In addition, considering that it is argued that ESTs are quite peculiar technologies, the literature on backward and forward

linkages is silent on FDI-carrying ESTs. Therefore, it cannot be guaranteed that the findings of these studies apply to the transfer of ESTs as well.

(2) FDI Horizontal Linkages and Technology Transfer

Liu and others (2009: 1114) note that spill-over effects from horizontal linkages may take place in three ways, namely when local firms copy technologies from TNCs, when they occur through observation or the hiring trained personnel, and when competition squeezes local firms to search for and adapt new technologies in order to increase their efficiencies. Theoretically, there are some benefits that may accrue to local firms through horizontal linkages, such as learning through observation and the imitation of multinationals, benefitting from the employees of multinationals who resign to start-up new or join local firms, and when multinational investment facilitates ñthe entry of international trade brokers, accounting firms, consultant companies, and other professional services, which then may become available to local firms as wellò (Blalock and Gertler 2004: 397).

Whilst horizontal linkages have been widely studied, the findings are rather mixed. On the one hand, Aitken and Harrison (1999) find that horizontal FDI spill-over effects are small or do not exist at all. Their assessment is that there is a negative relationship between inward FDI and domestic industrial productivity. Indeed, Blalock and Gertler (2008) and Javorcik and Spatareanu (2008) have provided some evidence from Indonesia and Romania, confirming the negative pattern established by Aitken and Harrison. Further studies in China by Hu and Jefferson (2002) also confirm the existence of negative horizontal spill-over effects of FDI into the electronics industry. The reasons provided are related to the fact that multinational entry into host countries may hurt local firms in a number of ways. Foreign firms may lure talent away from local firms thereby creating a ñbrain drainò (Blalock and Gertler 2008). Foreign firms often pay higher wages which may raise wages for all firms in competitive labour markets (Aitken, Harrison and Lipsey 1996). If higher wages do not reflect an improvement in employee capabilities, then firms may substitute capital for labour in an inefficient manner (Blalock and Gertler 2008).

On the other hand, Keller (2010: 812) points out that ñthere is also evidence of positive technology spill-overs from horizontal FDIò. In contrast to the earlier work of Aitken and Harrison (1999), Haskel and others (2002) calculate positive FDI horizontal spill-over coefficients in their studies in the UK. In another study on inward FDI accruing to US firms in

the period 1987 to 1996, Keller and Yeaple (2009) find robust and statistically significant evidence for technology spill-over effects. Studies by Wei and Liu (2006) and Wei and others (2008) report positive horizontal spill-overs of FDI in Chinese manufacturing industries.

Since the various studies differ in their findings, it is difficult to reach final conclusions. However, it can be deduced that the reasons for different findings are methodological and data-related. Keller (2010: 813) succinctly points out that:

> é some observers have concluded that while there are no horizontal technology spill-overs from FDI in less-developed countries, they do seem to exist in richer countries, such as the United States. However, this cannot be the full story, because there is much variation in FDI spill-over estimates even among the set of rich countries. Thus, a simple technology gap explanation may not be able to explain the different findings for less-developed versus rich countries.

So far, evidence confirms that technology spill-overs from horizontal FDI are concentrated in high-technology sectors, whereas there are no FDI spill-overs in low-tech sectors (Keller 2010; Keller and Yeaple 2009). An assessment of the literature on FDI horizontal linkages and technology transfers shows that the literature places much emphasis on TNCs and the processes of technology transfer. Because of the existing literatureôs focus on macro-level processes and TNCs, it provides little insight into the policy and institutional conditions that facilitate or catalyse these linkages.

(3) FDI Labour Migration Spill-Overs and Technology Transfer

Generally, FDI requires the firm to transfer its technology to its subsidiary. Local workers hired to work in various capacities in local TNC affiliates may act as agents in transferring technology, especially if they are well-acquainted with the technology. This familiarisation can take place through oral communication and on-the-job training. Several studies have highlighted that TNC affiliates, in general, invest more than domestic firms in training their managers and technical staff (Djankov and Hoekman 1999; ILO 1998; Lindsey 1986). Studies by Gerschenberg (1987) and Chen (1983), *inter alia*, provide evidence in this regard. The most comprehensive analysis of training activities of multinationals is provided by Sousa (2001) in a study on UK firms. Studies by Gerschenberg (1987) and Aitken, Harrison and Lipsey (1995) concluded that, in order to keep trained workers from moving to competitors and domestic firms, TNC affiliates tend to provide higher wages and better incentives than local domestic firms. Studies of manufacturing

firms in Ghana by Görg and others (2002) found that workers who work for, and receive training in, foreign firms experience more rapid wage-growth than workers being trained in domestic firms. Regardless of better incentives, worker mobility still takes place between affiliates and domestic firms for various reasons (UNCTAD 1992; Katz 1987; ILO 1981). Quite pointedly, Gerschenberg (1987) finds evidence of the movement of managers from multinationals to domestic firms in a study on the manufacturing sector in Kenya.

It is this labour mobility that can be catalytic in the transfer of technology. Fosfuri and others (2001: 207) state that spill-overs from FDI labour mobility can take two forms. When a trained worker is recruited by a local firm, ñpecuniary spill-overs arise when the MNE pays the worker a higher wage to prevent é [such a worker] from moving to the local competitorò. Explaining in detail the process of technology transfer through labour mobility, Keller (2009: 808) points out that TNCs can provide a learning environment for workers, in which they develop some skills that can be utilised upon leaving to work for domestic firms, or when they start up their own companies.

Fosfuri and others (1998) advance three conditions that can make technology spill-over effects possible through labour mobility. First, this occurs when the aggregate profit that can be realised through the combined use of technology by domestic firms and foreign affiliates is higher than when foreign affiliates are run as monopolies. Second, this takes place when domestic firms attach a higher value to technology than foreign affiliates. And finally, this happens when local firms have reached a certain level of absorptive capacity. Supporting this with empirical evidence, Borensztein and others (1998) and Kokko (1994) found that low levels of absorptive capacity also reduce the possibility of technology transfer.

Spill-overs through labour mobility are greatly affected by whether the training offered by TNCs is of a general nature or more specific. When TNCs offer more general on-the-job training, the chances are higher for labour mobility and subsequent technology transfer. In addition, Fosfuri and others (2001: 207) argue that ñit is not only the nature of the training (general versus specific), but also the degree of product/market competition which affects labour mobilityò and technology transfer.

The studies on labour mobility and transfer of technologies provide institutional-level insights on how FDI can facilitate technology transfer. They put emphasis on the transfer of knowledge

and other tacit information, rather than machinery or hardware. The main demerit of existing literature is that it mainly looks at internal TNCs structures and policies at the expense of national policies and how these could facilitate technology transfer through labour mobility. In addition, literature on labour mobility and the transfer of ESTs could not be found within the existing body of literature.

(4) FDI, the Internationalisation of R&D and Technology Transfer

Technology transfer may take place through FDI when TNCs internationalise their R&D divisions by locating some subsidiaries abroad. However, most R&D activities of TNCs are located in home countries instead of host countries. Thus, R&D continues to be one of the least internationalised activities of TNCs (UNCTAD 2005; Reger 2004; Patel and Pavitt 1991). In spite of this, Blomström and Kokko (1998) acknowledge that there is a substantial amount of R&D activity that occurs in host countries, especially through the activities of TNC affiliates.

Studies by Fairchild and Sosin (1986) found that TNC affiliates in Latin America conducted a significant amount of local R&D, and that the R&D budgetary inputs of foreign affiliates in Latin America compared favourably with those of local firms. Further studies by Pavlínek (2012: 283) in the auto-industry, focusing on technology transfer between the rest of Europe and the Czech Republic, also concluded that the internationalisation of R&D is an important method of technology transfer. However, he also observes that home countries have retained knowledge and tacit information, but distributed manufacturing capacity to host countries in order to gain access to their markets.

In general, local affiliates of TNCs conducting R&D have an advantage over local firms as they can access parent-company R&D initiatives and also obtain R&D information from other affiliates. Thus, Blomström and Kokko (1998: 255) comment that ñthe affiliatesô R&D may therefore be more efficient than that of local firmsò. R&D divisions of TNCs located abroad may also contribute to creating local knowledge-generation capacity through activities of a corporate social responsibility nature. However, since technology enhances ownership-specific advantages, such initiatives that result in technology transfer are rather limited.

There is a substantial body of literature that looks at the internationalisation of R&D and the transfer of ESTs. This literature points to the importance of national policies and institutions in attracting R&D facilities to be located in a given host country, the technology capacity of the

host nation, incentives associated with R&D, and the necessity of quality educational and scientific infrastructure. However, the available literature does not deal in any depth with the attributes of ESTs, and how they would influence the location of R&D facilities.

#### *2.3.2.2 FDI and Technology Transfer: Home Country Conditions and Effects*

A home country has to ensure that the conditions exist under which FDI transfer of technologies that are of a high standing in political and international relations, and respect international obligations such as those enshrined in UN conventions, can take place. Therefore, through a good outreach of its foreign relations policy, it should be able to respect the sovereign rights of potential host countries. It should also be at the forefront of technological innovations, and be willing to share these innovations with other countries endowed with lesser technological capabilities.

The FDI and technology-transfer effects in home countries are not very different from those of host countries. Lin and Lin (2010: 437) argue that outward FDI and technology transfer can be categorised as either defensive or expansive. The global horizon theory defines defensive outward FDI as a strategy used to maintain business by seeking cheaper resources of production abroad when firms lose their comparative advantage in the home market. On the other hand, the business growth theory defines expansive outward FDI as that which seeks to pursue business growth and expand the scale of production and sales by penetrating new markets abroad.

At a theoretical level there are inconsistent findings on FDI and technology transfer. Walz (1997) suggests that outward FDI is positively correlated with technology transfer for those countries with relatively advanced technologies. In another study, Li and Hu (2004) indicate that by increasing the number of outward FDI bases, the return on R&D should be raised, average R&D costs reduced and, thus, innovation activities inside the home country encouraged. In other words, these findings point out that outward FDI and technology transfer should create benefits to the home country through increased rents. Furthermore, outward FDI may stimulate innovation inside the home country. However, these findings should be regarded with caution as ñfirms may also decrease their production cost[s] simply by establishing production bases abroad, without investing more in R&D. In a nutshell, expansive outward FDI may stimulate technological innovation, while defensive outward FDI may notò (Lin and Lin 2010: 437).

### 2.3.3 FDI and the Environment

#### *2.3.3.1 Costs and Benefits to the Environment*

The link between FDI and the environment has long been established in the relevant literature. There is a recognition that FDI, if not properly regulated, can cause much environmental damage in home and host countries. Different capital flows have different effects on the environment; hence, several studies have been conducted, focusing on the costs and benefits of such flows (UNEP 2003; UNCTAD 2001, 1997; OECD 1999; Zarsky 1999, 1997). The discourse on the effects of FDI on the environment has produced two contrasting, on-going arguments. On the one hand, there is the argument that these effects are positive, as FDI can ñgenerate new growth and new structural efficiencies, making larger investments in environmental protection possibleò (OECD 1997: 2). On the other hand, there is a view that totally refutes this, claiming that ñFDI leads to increased production and consumption of polluting goods, or to expanded industrial activity –and, thus, to increased emissions (OECD 1997: 2). The conclusion to draw from these two arguments is that the effect of FDI on the environment is rather complex and can be either positive or negative (or mixed), depending on the particular circumstances.

The arguments above, although rather simplified, form the basis for two broad paradigms, namely the ópollution-havenô hypothesis and the ópollution-haloô effect. The pollution-haven hypothesis is an outgrowth of the classical economic theory of comparative advantage. The latter postulates that rational economic actors concentrate on what gives them maximum advantage over other actors. They would, therefore, always strive to extract the maximum gain, meaning FDI is invested in sectors where TNCs can achieve maximum returns.

Built upon this classical economic theory, the pollution-haven hypothesis generally posits that environmental regulations may have an effect on decisions where industries should be located. Within this hypothesis there are two interrelated arguments. On the one hand, there is the industrial flight argument which contends that ñfree trade will open the flood gates for the migration of highly polluting industries to countries with lax environmental standardsò (Letchumanan and Kodama 2000). In practice, this means that ñcompanies will move operations to developing countries to take advantage of less stringent environmental regulationsò (Mabey and McNally 1999). However, it is not possible for all FDI to easily take the industrial flight approach when subjected to strict environmental regulations and costs. Realising this, Esty and Gentry (1997) analyse this approach in relation to types of FDI. They argue that market-seeking

and production-platform-seeking FDI would not really be sensitive to increased environmental costs or strict regulatory requirements. But they also observe that resource-seeking FDI would be particularly susceptible to differences in environmental costs.

On the other hand, there is the argument that ñputs more emphasis on the ópullô factor; that is, on the direct use by developing countries of low or lax environmental standards to attract foreign firmsò (Zarsky 1999: 7). In practice, ñcountries may purposely undervalue their environment in order to attract new investment é [– this] leads to excessive levels of pollution and environmental degradationò (Mabey and McNally 1999). Thus, Zarsky (1997) observes that the rush of industries to pollution havens creates a ñrace-to-the bottomò in terms of environmental standards and sustainability practices.

Studies on the pollution-haven hypothesis are not conclusive (Letchumanan and Kodama 2000: 62) and require more evidence. However, three threads can be derived from the findings of empirical studies. There are studies by Mani and Wheeler (1997), Han and Braden (1996), Xing and Kolstad (1996), Low and Yeats (1992), and Kalt (1988) which found some empirical evidence in support of the pollution-haven hypothesis. There are also other studies which did not find significant supporting evidence for this hypothesis, including research done by Bouman (1996), Tobey (1993), and Grossman and Krueger (1992), among others. Then, there are some studies that did not find any evidence for the ópollution-havenô hypothesis, including those conducted by Repetto (1995) and Sorsa (1994).

Although Birdsall and Wheeler (1992), and Lucas and others (1992), did not find evidence for this hypothesis either, their studies suggested that the more open an economy is, the more likely it is to attract cleaner industries. However, Letchumanan and Kodama (2000) argue that these studies are quite optimistic about FDI and, in actual fact, contradictory to the pollution-haven hypothesis. Also, further studies on this new research trend have not produced any clear results. Therefore, the wide range of conclusions reached by different analysts on the pollution-haven hypothesis may be attributed to the diversity of conceptual and theoretical frameworks, methodologies, and data sources employed (Letchumanan and Kodama 2000).

Besides the pollution-haven hypothesis, there is also the ópollution-haloô thesis. According to Zarsky (1999: 8):

- é the ópollution-haloô concept focuses not on industry location, but on the environmental performance of foreign relative to domestic firms. It suggests that what is important is not why a firm locates where it does, but how it performs once it gets there.

This thesis stems from the free-market liberal and neo-liberal schools of thought. Zarsky (1999: 5) observes that ñadvocates of neo-liberal governance argue that FDI is positively good for the environmentò, and this is based on a belief in the inherent good of the market in determining investment, trade, production, and consumption. In fact, liberals advance three arguments why FDI is good for the environment. First, FDI is mainly an activity of TNCs mostly headquartered in the developed world. These transnational companies usually internalise and standardise operations and technologies from the headquarters down and across subsidiaries, including those in developing countries (Levy 1995; Birdsall and Wheeler 1993; Pearson 1987). Since TNCs from developed countries ñpossess newer and cleaner technology and [utilise] better management practicesò, such production techniques and best practices are best transferred through FDI (Zarsky 1997: 5). Thus, for liberals the transfer of standardised, newer and cleaner technologies is definitely good for the environment.

Second, there is an argument that financial constraints are the most important barriers to investment in ESTs (OECD 1995). Liberals argue that many TNCs involved in FDI have greater access to capital from world markets and foreign savings. This eases the financial constraints that would otherwise ñprevent firms from investing in potentially more efficient, less environmentally-damaging capital equipmentò (OECD 1997: 7). The third argument, as explained earlier, highlights FDI and spill-over effects from technology transfer mainly associated with imitation, reverse engineering, and labour migration.

Zarsky (1997: 5) observes that there are a ñnumber of case studies that have demonstrated a ópollution-haloô effect, suggesting a slow, but sure, convergence of standards upwardsò. For example, Grossman and Krueger (1991) have concluded that the demand for environmental quality rises with income, once income per capita reaches about five thousand US dollars. This means that poverty and low incomes may limit the bargaining and negotiation space for a better environment. The OECD (1997: 13) also argues along the lines of the pollution-halo thesis by stating that ñfears of a órace to the bottomô in environmental standards, based on the idea of ópollution havensô, may be generally unfounded. FDI is an increasingly important óengineô for sustainable development in many countriesò. Also, Golub and others (2011: 12) sum up the discourse on FDI and the environment well by explaining:

- é the general conclusion is that FDI is almost always at least as environmentally sensitive as domestic investment when specific case studies are considered. Cross-sectoral econometric studies also support the hypothesis that foreign firms are, on average, cleaner than domestic firms, although the existence of sporadic cases of pollution havens cannot be completely ruled out. In any case, there are national, sector and industry-specific technological and regulatory characteristics that enhance or reduce the greening effects of FDI.

It is worth pointing out that notwithstanding the existence of two competing viewpoints on FDI and the environment, in the past few decades international regimes, norms, rules or regulations have been designed and adopted by various countries to govern the content and flow of ESTs, including those carried through FDI. The international regimes in place to control the transfer of ESTs include Agenda 21, and others enshrined in UN conventions dealing with climate change, biodiversity, forests, fisheries, and so on.

#### *2.3.3.2 FDI and the Transfer of Environmentally Sound Technologies*

It is only during the past few decades that the transfer of ESTs, through such mechanisms as FDI, has become a matter of international relations and foreign policy. Increasingly, countries have come to realise that FDI has the potential to transfer ESTs, particularly from developed to developing countries (UNCTAD 2001, 1999). In international negotiations on climate change, for example, there is a lot of emphasis on building norms that would govern FDI in the transfer of ESTs (Agenda 21, Chapter 34). However, clear evidence of where and how technology has been transferred, or is being transferred, through FDI is still largely lacking. In addition, negotiators have assumed that it is home countries that have to ensure the transfer of technologies through FDI by way of measures such as the relaxation of intellectual property rights and other barriers. Again, it is only recently that international negotiators, particularly in the area of climate change, have realised the importance of creating host country measures for FDI and the transfer of ESTs.

Over the past few decades, a number of scholars have focused on the transfer of ESTs. However, a few of these have concentrated specifically on FDI-carrying ESTs. Gallagher and Zarsky (2008: 4) identify three types of environmental spill-overs which relate to the transfer of ESTs, including clean technology transfer, technology leapfrogging, and pollution halo. Whilst pollution halo denotes the transfer of best environmental management practices, clean

technology transfer refers to the utilisation and adoption of less polluting and more efficient production technologies by foreign firms (than those of domestic firms), and technology leapfrogging alludes to the transfer of both efficient and better production and pollution-reduction technologies.

Although Gallagher and Zarsky (2008) assert that cleaner technologies may be transferred through FDI, the evidence to date is not entirely conclusive. A detailed case study of Chileôs mining sector by Lagos (1999) found that foreign companies performed much better than local firms, mainly due to the possession, acquisition and transfer of ESTs. A similar conclusion was reached by Ruud (2002) in a study conducted in the Indian manufacturing sector. Furthermore, studies in Côte dôIvoire, Venezuela and Mexico by Eskeland and Harrison (1997) also confirmed the transfer of cleaner and environmentally-friendly technologies through FDI. However, the fact that FDI may transfer cleaner technology, including ESTs, should not be taken for granted. Research shows that this is dependent on a number of factors other than the volume of FDI. Among the most crucial elements is FDI quality, which relates to the type of investment, the kind of assets that is bought by the TNC, the role that affiliates play within the global network of the transnational company, and the sector for which the FDI is destined.

Besides the transfer of cleaner technologies, FDI may also facilitate technology leapfrogging. In defining the concept of technology leapfrogging, Gallagher and Zarsky (2008: 24) suggest that ñé through [the] transfer by TNCs of the least polluting, state-of-the-art technology and management techniques, developing countries can move to the global production frontierò. In other words, the process of leapfrogging means that the technology-lagging country does not have to go through the same processes and stages that the technology source had to go negotiate, but actually jumps some stages in the process of acquiring advanced technology. Through leapfrogging, firms may not necessarily need to gradually and incrementally develop their own techniques, but simply acquire technologies that are available in the open marketplace.

For technological leapfrogging to take place through FDI there are a number of host country characteristics that are essential: these include the amount and kinds of FDI that is being attracted, the contribution of FDI to growth and the competitiveness of the host country, the economic policy regime in place, and whether the host country has the requisite social or absorptive capacities ï in other words, the capabilities to assimilate and take advantage of foreign

ESTs. Although the leapfrogging effect is a theoretically sound concept, providing the necessary practical evidence is a rather daunting task.

Another novel perspective on FDI and the transfer of ESTs is how this is viewed from the vantage point of developing and emerging countries. Worldwide, FDI from developing and emerging countries is on the increase. What needs to be explored, however, is whether this FDI also transfers ESTs. Zarsky (1999) tries to answer this in passing, noting that FDI from developing and emerging countries may not necessarily be cleaner than that from developed countries. In agreement, Esty and Gentry (1997) state that the most egregious examples of environmentally-deleterious technology transfer appear to involve firms from emerging countries, such as Hong Kong, Singapore and Taiwan.

FDI from developing and emerging countries is generally perceived as ineffective in transferring ESTs, and for three reasons. There is a belief that a firm will mimic home country policies, even when it invests in another country. Many developing countries have weak policies and legislation on the environment; therefore, a TNC tends to utilise these when it engages in FDI in another country. Moreover, much of the FDI from developing countries is still concentrated in the extractive industries ï thus, with a resource-seeking focus. There is also the perception that corruption in developing countries hinders a proper analysis of TNC activities in environmental matters (Esty and Gentry 1997).

The view that FDI from developing countries transfers fewer ESTs is contradicted by Zeng and Eastin (2012), whose findings suggest that ñon average LDC FDI does not convey [pass on] corporate environmental practices to investments abroad. Indeed, FDI from developing countries can actually increase the level of environmental stewardship of all host-country firmsò. This argument is supported for two reasons. First, TNCs from developing countries also want to achieve international standards in environmental matters, such as ISO 14001. International standards certification directly promotes greater confidence in the FDI from a developing-country TNC among host-country stakeholders. Second, it creates competition among local firms to also pursue certification and develop environmental management systems. The adoption of such systems, plus processes associated with ISO 14001-certification, may well lead to better environmental management practices.

## 2.4 LOCATING THE STUDY IN THE FDI-TECHNOLOGY SCHOLARSHIP

The process of literature review has highlighted several pertinent matters about FDI and technology transfer. First, the reviewed literature shows that there are various independent, discipline-based studies that have attempted to explain some aspects related to technology transfer and FDI. These studies usually start off with an assumption that the transfer of technologies (including ESTs) through FDI is quite obvious, and then proceed to collect empirical evidence to support or refute this claim. But these studies tend to overlook the regulations, agencies, and international relations environment that enable the transfer of ESTs through FDI. This situation calls for a thorough investigation of these elements. From such research, studies such as the present one may emerge, focusing on the state as the central sovereign authority which can invoke sovereignty principles and impose distortions on the market, as well as employ structural power to catalyse and promote the transfer of ESTs through FDI.

Second, the reviewed literature showed a clear focus on the transfer of technologies, in general, and very little focus on ESTs, in particular. In this chapter, it is only when the literature review zeroed in on FDI and the environment that the explicit mentioning of ESTs becomes apparent. As argued in Chapter 1, ESTs have three peculiar characteristics that warrant a focused investigation, instead of bundling them into the same basket as general technologies. This is justification for further studies, focusing specifically on the transfer of ESTs.

Finally, the literature review shows that although there are studies that have sought empirical evidence for the transfer of technologies through FDI, conclusions are quite mixed and unclear. Furthermore, only a limited number of these studies focused on African countries and, therefore, may be of relevance. Hence, Africa-focused studies that seek empirical evidence on FDI and the transfer of ESTs are of crucial importance.

The three themes, briefly articulated above, will assist us in locating this study, focusing on the energy sectors of Angola and South Africa in particular. The study does not clearly fit into the available literature. Therefore, it attempts to fill the gaps in the existing literature, presents a new approach to conceptualising the research problem, and provides a robust methodology for the study of the subject.

## 2.5 CONCLUSION

This chapter has defined the key concepts and provided a general review of literature on FDI and technology transfer, including the transfer of ESTs. It also highlighted the gaps in the literature reviewed, thus justifying the present study. From the discipline-based theories and concepts, as well as the inconclusive evidence, it is concluded that assessing or evaluating the transfer of ESTs through the conduit of FDI is a rather complex matter. As such, the understanding of how FDI can or cannot transfer ESTs, demands a theoretical framework that captures the dynamic nature of this relationship, explains the trends and dynamics of FDI flows, and lists the multiple actors, including state and non-state actors, involved in facilitating such flows. The next chapter, therefore, presents the conceptual framework for the study.

# CHAPTER 3: THE CONCEPTUAL FRAMEWORK OF THE STUDY

## 3.1. INTRODUCTION

The last chapter has defined the key terms used in this study, reviewed the literature on FDI and the transfer of ESTs, and provided a rationale for the study. This chapter designs a conceptual framework that is utilised in the gathering of empirical evidence, conducts an analysis, and generates the recommendations for the rest of the study. Using the literature review, the conceptual framework aims at bringing together different facets pertaining to investment, the transfer of technology, and environmental sustainability. It specifically locates the study on FDI and the transfer of ESTs in the IPE, IR and economics disciplines. This framework will enable the study to make an enquiry into the nature of FDI and technology transfer, more specifically FDI that transfers ESTs. As stated earlier, this study treats FDI and the transfer of ESTs as a rather complex field of enquiry which should not be conducted by way of reductionist approaches.

## 3.2 DISCIPLINES UNDERPINNING THE CONCEPTUAL FRAMEWORK

In order to create a conceptual framework to guide the study, ideas are borrowed mainly from the Economics and IR disciplines. This section, therefore, deals with theories and concepts located in these two disciplines, and these then underpin the framework.

### 3.2.1 FDI and the Transfer of ESTs in Economics

In Economics, the study of FDI is to a large extent a direct or indirect analysis of the activities of TNCs. As such, theories on FDI also elaborate on transnational corporations, and generally attempt to answer questions such as: Why does FDI occur? Where does FDI go? Who are the recipients of FDI? How can TNCs successfully compete in foreign locations? According to Jordan (2005: 18), although there are several questions researchers may ask about FDI, the theories that they utilise can largely be classified into two groups: those at the micro-economic level, and those at the macro-economic level. Rusike (2008: 8) notes that ñthe micro-economic theories focus on firm-specific characteristics that influence the decision-making of firms; for instance, market-imperfections theoriesò. On the other hand, Jordan (2005: 18) states that macro-

economic theories ñseek to analyse country characteristics that explain FDI flows within [countries and] across é [borders]; that is, internalisation and product-cycle theoriesò.

There are two main macro-economic theoretical perspectives that explain the impact of FDI on host country economies, namely the modernisation and dependency theories. According to Adams (2009), modernisation theories are based on neo-classical and endogenous growth theories, which suggest that FDI could promote economic growth in developing countries. They are based on a fundamental principle in economics, namely that economic growth requires capital investment. In this regard, Li and Liu (2005) note that theoretically FDI in the neo-classical growth model promotes economic growth by increasing the volume of investment. In terms of this perspective, FDI raises economic growth by providing capital and generating technological diffusion from the developed world to the developing world. As Lim (2001: 4) suggests, ñFDIôs contribution to growth comes through its role as a conduit for transferring advanced technology from the industrialised to the developing economiesò.

To provide empirical evidence on FDI and technology, Borensztein and others (1998) developed a model where long-run economic growth is determined by technological progress that takes place via a process of capital-deepening, as new varieties of capital goods are introduced. Similarly, Findlay (1978) developed models that postulated that FDI increases the rate of technical progress inside the host country through a contagion effect from the more advanced technology and management practices employed by foreign firms. And Benhabib and Spiegelôs (1994) findings suggest that human capital plays a role in economic growth by assisting in the adoption of technology from abroad and in creating the appropriate domestic technology. Thus, FDI affects growth through technology transfer as the host country imitates foreign technology and adapts it, thus making it appropriate for domestic purposes.

Within the modernisation paradigm, Calvo and Sanchez-Robles (2002) conduct a discussion on the importance of technology transfer. They state that the transfer of technology through FDI in developing countries is especially important, because most developing countries lack the necessary infrastructure in terms of an educated population, liberalised markets, and economic and social stability, all needed for innovation in order to promote growth. Hence, the importance of FDI should be understood in terms of closing the gap in knowledge or human capital, rather than the gap in physical capital as suggested by Romer (1993, 1986), the paucity of which is the

main stumbling block facing developing countries in their attempt to keep up with or advance on the more developed countries.

Apart from technology and capital, the modernisation perspective expands on other attributes of FDI, what it does, and its importance. For example, Kumar and Pradhan (2002) observe that FDI usually flows as a bundle of resources, including organisational and managerial skills, marketing know-how, and market access, through the marketing networks of multinational enterprises. Similarly, Balasubramanyam and others (1996), and De Mello (1996) note that FDI is a composite bundle of capital stock, know-how and technology, and can augment the existing pool of knowledge in the recipient economy through labour training, skills-acquisition and diffusion, and the introduction of alternative management practices and organisational arrangements. Nath (2005) further points out that FDI plays a two-fold function by contributing to capital accumulation, and by increasing total factor productivity. Likewise, Coe and Helpman (1995), Coe and others (1997), and Keller (1998) found that FDI is a means of introducing foreign technology into domestic production and raising total factor productivity. As such, countries that have attracted more FDI, as well as machinery and equipment, from world-technology leaders have seen more rapid growth in total factor productivity.

Despite several nuances that the modernisation paradigm provides on FDI and economic growth and what it generally achieves, the perspective has remained silent on FDI and the transfer of ESTs, in particular. In addition, most of the studies conducted within this paradigm have mainly focused on how the developed world has been shouldering the burden of modernising developing economies. Thus, the modernisation paradigm does not directly articulate aspects of FDI and the transfer of ESTs in Africa.

In contrast to the modernisation paradigm on FDI there is the dependency paradigm which supports Rodneyôs (1972) analysis of ñhow Europe underdeveloped Africaò. According to this paradigm, FDI is likely to have a negative effect on growth and the distribution of income (Adam 2009). It explicates that FDI creates an industrial structure in which monopoly is predominant, leading to the under-utilisation of productive forces (Bornschier and Chase-Dunn 1985: 24). It also assumes that an economy controlled by foreigners would not develop organically, but would rather grow in a disarticulated manner (Amin 1974), because of the multiplier effect by which demand in one sector of a countryôs economy creates a weak demand in another and thereby leads to stagnant growth (Akinlo 2004; Ayanwale 2007). Aligned with the dependency theory is

the ópollution-havenô hypothesis. The latter claims that an open-market regime will encourage the flow of generally low-technology polluting industries to developing countries. However, little empirical evidence seems to exist to support this contention (Javorcik and Shang-Jin 2004; Letchumanan and Kodama 2000).

Having presented these two theories, it can be concluded that there are conflicting macro-economic theoretical viewpoints on the role of FDI in growth. But unlike the modernisation theory, the dependency paradigm (through the pollution-haven hypothesis) attempts to directly tackle issues of FDI and the transfer of ESTs. However, more empirical evidence that illuminates the pollution-haven hypothesis is needed. Such evidence should also be grounded in the realities of African countries and the developing world, more generally.

There are also some economics theories that focus on FDI and the transfer of technology. Achanda and Gosch (1994: 163) define technology transfer as ña process by which technology, knowledge and information developed in an organisation, in a given area, or for a particular purpose is applied and utilised in a different setting or contextò. But not all technologies are transferrable; hence, Mansfield (1982) and Bellôs (1990) classifications of transferable technologies, already explained in Chapter 2.

Some economics theories focus on the channels through which technology may be transferred. In this regard, Li and Liu (2005) observe that, in an open developing economy, there are four channels available for such transfers. The first is through FDI, which occurs when a TNC with more advanced technology invests in a foreign (external) host economy. The second is via imports of high-technology capital goods. The third is through licensing or technology purchase. And the last is through the transfer of human capital by way of other means, such as international labour immigration. Based on the foregoing categorisation, this study will be prioritising the first channel – technology transfer through FDI. Hence, the other three channels do not fall within the ambit of this study.

Achanda and Gosch (1994: 164) contend that technology transfer can ñoccur from a supplier to a recipient by [way of] various mechanismsò and modes. As such, they classify modes of technology transfer into commercial and non-commercial. Whereas commercial transfers are contracted primarily through the market, non-commercial transfers occur primarily through non-market institutions. Commercial methods are through FDI in a host-country subsidiary or joint

venture, licensing of intellectual property rights (IPR), technical assistance, sale, installation and servicing of machinery, and franchising of consumer goods and services. Non-commercial methods through are advisory groups, personnel exchange, education, and information dissemination.

It should be cautioned that the distinction between commercial and non-commercial modes of technology transfer does not imply that this study only deals with the former and excludes the latter. This clear-cut distinction, whilst theoretically ideal, is not appropriate in real world settings. In fact, commercial methods of technology transfer can also contain some non-commercial facets, and vice versa. Bell (1990) argues that technology transfer is generally a component of FDI, and that TNCs are the main actors involved in the flow of technology to developing countries, using the commercial route. In this scenario, technology is transferred between affiliates, from parent company to its branches and then amongst branches, without formal agreements being drafted and signed.

There is some general economics literature that focuses on the transfer of ESTs. Agenda 21, a product of the UN Earth Summit of 1992 (a non-binding, voluntarily implemented action plan with regard to sustainable development), in Article 34.3 defines ESTs as ñnot just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment, as well as organisational and managerial proceduresò. From this, Muchie (2000: 203) deduces that Agenda 21ôs definition contains three important definitional components, namely that ESTs are discrete entities, technological systems, and new technological paradigms or revolutions. He further elaborates that if ESTs are defined as discrete entities, they appear to be process and product technologies that generate little or no waste. If ESTs are defined as technological systems, they appear as total systems which include know-how, procedures, goods and services, and equipment, as well as organisational and management procedures. And if ESTs are defined as new technological paradigms or revolutions, they have a responsibility to protect the environment. In this sense, ESTs are meant to be less-polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they are substituted.

As mentioned in Chapter 1, the transfer of ESTs is embedded in several international legal instruments, including treaties and agreements. Some of these instruments make a clear distinction between developed and developing countries. Others are all-encompassing, thus

broadly mentioning that the ñtransfer of technology should be promoted in order that all states [or] parties benefit é fromò it (UNCTAD 2001: 7). Some of the instruments point to the need for ñfavourable treatment for developing and/or least-developed countries, resulting in differentiated obligations with regard to implementation processesò (UNCTAD 2001: 7). According to Muchie (2000: 203), having regard to the international dialogue on a ñcommon and differentiated responsibilityò for ESTs, it is suggested that in order to fulfil this responsibility and commitment to the environment, technology proprietors from countries with strong systems of innovation are enjoined to transfer ESTs on ñfavourable termsò to developing countries with relatively weak systems of innovation.

The effective transfer and proper management of appropriate ESTs provides several benefits, such as employment, increased levels of literacy, research and development, a better quality of life, reduced social inequalities, and enhanced creativity. However, financial mechanisms to support and promote the transfer of ESTs are an absolute necessity. Investments in ESTs should be considered in tandem with general investments for the building of technological capabilities. In this regard, Worrel and others (2001: 29) observe that ñcountries that spend, on average, more on adaptation seem to be more successful in technology transfer; hence, successful technology transfer depends on [the] transfer of technological capabilitiesò.

Economics also provides for the study of institutions, especially those that support markets, facilitate economic exchange, define and protect property rights, and register and enforce contracts. The works of North (1990, 1981), Weingast (1997, 1995) and Oslon (1982), among others, have highlighted the relevance of institutions in the protection of property, economic growth, and development. North (1990: 107) assigns an essential role to institutions by stating that they are ñdeterminants of [the] long-run performance of economiesò, and they shape economic growth as ñthe inability of societies to develop effective, low-cost enforcement contracts is the most important source of both historical stagnation and contemporary underdevelopment in the Third Worldò.

### 3.2.2 FDI and the Transfer of ESTs in International Relations

The transfer of ESTs in IR has to be viewed from the vantage point of debates and discussions that were conducted around the subject of the environment and how these contributed towards the generation of theories and concepts. In the early 1960s, there was growing concern among

countries that the accelerated economic growth and industrialisation that occurred in the developed world after the Second World War was causing significant harm to the environment. The politicisation of environmental matters was a phenomenon of the late 1960s and early 1970s, culminating in the first United Nations Conference on Human Environment (UNCHE) held in Stockholm in 1972. Hence, with regard to formalised international politics on the environment, the 1972 UNCHE was a landmark event in a number of ways. It was the first institutional activity that led to the founding of the United Nations Environment Programme (UNEP), and involved some 144 delegates from many countries from around the world, as well as key non-state actors concerned with the environment.

In the preparation period that preceded the UNCHE and, especially, during the conference proceedings, clear differences between developed and developing countries emerged, the former focusing on the environment and the latter prioritising their developmental needs. The rapid and high levels of development and economic growth that developed countries had experienced since the Second World War had impacted positively on the populations of those countries, allowing them to shift their focus to environmental issues. In contrast, the focus of developing countries on development was quite understandable, as many of these countries struggled with a multiplicity of problems, including large balance-of-payment deficits, huge debt burdens, shortages of foreign exchange, stagnant export sectors, and growing demands for imported consumer goods. The proposed solution for these problems was that developing countries should take concerted steps towards industrialisation. But, notwithstanding the differences in priorities and approaches, the conference focused on point-source pollution and its trans-boundary effects. So, in an attempt to accommodate these divergent viewpoints, the conference adopted Principle 21 which recognised that states had:

> é sovereign rights to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction and control did not cause damage to the environment of other states or other areas beyond the limits of national jurisdiction.

In relation to technology transfer, the conference discussed the transfer of resources, such as capital, technology and scientific expertise, from the richer states to poorer countries. But the argument advanced by Vaitsos (1970) and others in the early 1970s, that the transfer of technologies from the developed to developing world could, in practice, have only negative consequences for many of the least-developed economies, led to the politicisation of issues of

technology transfer (Reid 1993). The argument shifted the debate from the importance of technology transfer in the industrialisation process of developing countries, to the need for them to control the terms and conditions attached to the importation of foreign technology, so as to minimise exploitation and allow technological development to take place in an environment protected from foreign competition. By invoking technology-regulation and protectionism, this argument brought to the fore the participation of sovereign states in the issues of technology transfer. Thus, during the Stockholm Conference of 1972 and the post-conference period states were placed at the centre of issues regarding technology transfer, and the transfer of technology was elevated to the international relations agenda.

As a follow-up to the Stockholm Conference of 1972, the debates on technology transfer formed the basis of the United Nations Conference on Science and Technology for Development (UNCSTD) held in Vienna in 1979. The focus of the conference was on the international conditions for facilitating technology transfer to developing countries, influenced by the perception that developing countries are only the recipients of technology from the developed world, rather than technology producers in their own right. This was understandable because, at that time, there were few countries in the developing world with sufficient technological capacities to be able to participate in technology transfers.

Whilst international technology transfer entered the IR domain, and conferences and discussions on the issue took place, these occurrences did not have much influence on mainstream IR theory during the 1960s and 1970s. IR theory and concepts at the time tended to follow the realist tenets that focused on ôhigh politicsô, namely state actions and interactions in terms of military and security matters. Thus, at this juncture the dominant IR theory of órealismô considered environmental issues, conferences, and associated debates on technology transfer secondary to the study of IR. Hence, in IR during the 1970s and 1980s, international environmental concerns remained a preserve of only a few specialists (Young 1982, 1977). However, the rise in prominence of liberal notions of complex interdependence created an opportunity for concerns about, and discussions and conferences on, the environment to move to the centre of the IR discipline. Thus, interest in the environment in IR theorising gained momentum during the 1980s. The theory of ôcomplex interdependenceô, advanced by Keohane and Nye Jr. (1977), noted that societies were increasingly interconnected at various levels, where the priorities of foreign policy were reordered and where the use of force between and among developed countries was of decreasing relevance. In this state of affairs, there was an abiding concern that governments

would lose control, as many non-state entities were starting to mushroom by the day. Therefore, the theory of ócomplex interdependenceô highlighted the necessity to focus on inter-governmental co-operation, and allowed space (and the theoretical optical focus) for more IR analysis of environmental matters.

In 1977, UNEP started work that resulted in the 1985 Vienna Convention on the Protection of the Ozone Layer. This conference forum created a framework to reduce the effects of industrial pollution on the ozone layer. As there was limited scientific evidence at hand and a lack of political will, discussions during the forum were restricted to the creation of a framework and not the adoption of policies. At the forum, polluting industries, backed by European governments, questioned the notion of threats to the ozone layer. But despite these handicaps, the Vienna Convention broadened ñdevelopment and [the] transfer of technology and knowledgeò (UNEP 1985). In particular, the convention specified mechanisms for technology transfer, including (UNEP 1985):

> é [the] facilitation of the acquisition of alternative technologies by other Parties, provision of information on alternative technologies and equipment, supply of special manuals or guides é , the supply of necessary equipment and facilities for research and systematic observations, and appropriate training of scientific and technical personnel.

Following soon after the Vienna Convention, leaders converged again in Montreal in 1987 to establish reduction requirements for the production and use of chlorofluorocarbons. The result was the Montreal Protocol, signed in September 1987 by the US, the European Community, and 23 other countries who were the main emitters of chlorofluorocarbons. The Protocol was fully implemented in 1989, and an amendment was made in 1990 in London to establish a Multilateral Fund (MLF) in order to assist signatory parties in adhering to the protocolôs regulations. Quite pointedly, the MLF was the first financial mechanism to result from an international treaty and since has been the most comprehensive instrument for the facilitation of technology transfer. In boosting technology transfer, the Montreal Protocol and the MLF provided for activities such as identifying technology needs and facilitating technical co-operation, providing additional resources when and where necessary, and monitoring and facilitating bilateral, regional and multilateral co-operation. Article 10.10a of the Protocol emphasises the importance of technology transfer by stressing that the ñbest available, environmentally-safe substitutes and related technologies é [must be] expeditiously transferred under the most favourable

circumstancesò (UNEP 2000). To this day, the Montreal Protocol is considered the most successful international environmental agreement.

The Vienna Convention of 1985, as well as the Montreal Protocol of 1987, in combination with other environmental conferences held in the late 1980s and early 1990s, had a determining effect on the theoretical development and conceptualisation of the environment as an issue area in IR. The IR response to the international politics of the environment during this period was essentially to change the conceptualisation and theorising based on complex interdependence/ transnationalism to an institutional approach. The institutional approach that dominated the analysis of environmental issues, including matters of technology transfer during this era was mainly anchored in liberal institutionalism which, as Smith (1993) observes, drew its perspectives from a pluralist tradition. The latter is reflected in the works of Young (1989), Potter and Brown (1991), and Mathews (1991) who used a problem-solving rather than a critical approach. Their conceptualisation and theorising on environmental issues in IR focused mainly on co-operation between and among various state and non-state actors, as well as on institutions for co-operation in the international arena. Thus, the conceptualisation of technology transfer in the liberal, institutional tradition dwelt on the role of the state and non-state actors, and the creation of systems at the international level that would ensure that such transfers do indeed occur.

In the 1980s, liberal institutionalism and realism both spawned new generations of approaches ï neo-liberal institutionalism and neo-realist institutionalism, respectively – that together encompass the institutional approach in IR. Here, the common focus is the study of regimes, which comprise of systems of international principles, norms, rules, and decision-making procedures, and has provided the dominant mode of analysis on technology transfer in IR (Krasner 1983). Thus, an institutional-regime analysis was used to examine and evaluate the achievements of the Montreal Protocol, demonstrating both the need for, and effectiveness of, international rules in maintaining the incentives for developing ozone-friendly technologies –and, above all, the ways in which there could be a rapidly developed policy in line with the advance of scientific knowledge.

Institutional concepts and theories, including those focusing on regimes, have also been applied in analyses of other discussions and conferences that took place after 1987. Besides previous allusions to technology transfer, the concept was only clearly promoted and defined at the 1992

United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, popularly known as the Rio Earth Summit. However, earlier divisions between the developed and developing countries dented the success of the conference – for example, the US refusal to assent to emissions targets and caps. The developing countries steadfastly maintained their position that the focus of the conference should be on development, whilst the developed countries wanted it to concentrate on the environment. Furthermore, developing countries complained that they had not been able to access much of the money promised through the Montreal Protocol and the MLF. Thus, at the Rio summit, developing countries asked for financial and technological aid to protect themselves from the risks posed by climate change. Eventually, an accord was reached, and the UNCED (through Agenda 21) launched a United Nations Framework Convention on Climate Change (UNFCCC).

Agenda 21 and the UNFCCC prioritised technology transfer, especially the transfer of ESTs, through several provisions that are well documented in Chapter 34 of Agenda 21. Chapter 34.7.4 emphasises that ñthe availability of scientific and technological information and access to, and transfer of, environmentally sound technology are essential requirements for sustainable developmentò (UNCED 1992). In addition, Chapter 34.14a and 34.14d stress that ñaccess, in particular of developing countries, to scientific and technological informationò and promoting ñendogenous capacity-buildingò should be ensured (UNCED 1992). The UNFCCC went even further than Agenda 21, explicitly making technology transfer an óAnnex II Responsibilityô for Parties as per the provisions outlined in Article 4.5, which requires that:

> é developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties.

Furthermore, the UNFCCCôs Article 4.3 also places a responsibility on developed countries for providing sufficient financial resources to cover the ñfull incremental costsò of programme implementation. Besides these provisions in the framework convention, it crucially holds the Conference of Parties (COP) responsible for developing a financial mechanism for funding technology transfer projects. In this regard, the Global Environment Facility (GEF) was established in 1991 under the auspices of the World Bank, and restructured during the Earth

Summit of 1992 to become a separate institution, assigned as the financial mechanism of the UNFCCC.

Several COPs have been convened since 1995, but the most significant, focusing on issues of technology transfer, was COP3 which was held in Kyoto, Japan. It resulted in the Kyoto Protocol of 1997, entering into force in 2005, and can be considered the first agreement that set binding emissions targets for 37 industrialised countries and the European Community. It contains several provisions for the transfer of technologies; for example, Article 12 defines the Clean Development Mechanism (CDM), an instrument that enables sustainable development in the developing world, while assisting industrialised countries in achieving their emissions reduction requirements. The CDM enables Annex I parties to develop clean technology projects in non-Annex I countries as a cheaper alternative to developing such projects domestically. In its design, the CDM is mainly an instrument for the mitigation of climate change effects. However, a number of criticisms have been levelled against it. It provides a perverse incentive to invest in clean technology projects in developing countries, while ignoring reduction efforts domestically. Although the CDM is required to be only ña supplementary é [instrument] to domestic [emissions reduction] efforts, many developing countries contend that the language enforcing this provision is [rather] ambiguous, and that industrialised countries have abused the practiceò (Worldwatch Institute 2008). The Kyoto Protocol also established a Joint Implementation (JI) mechanism, which allows Annex I parties to invest in clean technology projects in other Annex I parties and applies the resulting credits to its emissions reduction goals. Unlike the CDM, which is between Annex I and non-Annex I parties, the JI is solely between Annex I parties – that is, between parties with concrete emissions reduction targets. This ensures technology transfer between high carbon-emitting countries.

COP4, held in Buenos Aires in 1998, tackled issues of technology transfer through the Buenos Aires Plan of Action (BAPA). It implemented the UNFCCC Articles 4.8 and 4.9 that aimed to facilitate the transfer of technology to countries most at risk from climate change, including small island states, countries with low-lying coastal areas, and countries liable to drought and desertification. Thus, BAPA attempted to advance the agenda of the Kyoto Protocol. COP5 and COP6 did not produce clear technology transfer achievements worth mentioning, but COP7 tackled some technology transfer issues. Through the Marrakech Accords of 2001 that resulted from COP7, the BAPA provisions were terminated and an Expert Group on Technology Transfer (EGTT) was constituted to ñanalyse and identify ways [and means] to facilitate the transfer of

technologyò (UNFCCC 2014). At COP7, the GEF and the Special Climate Change Fund (SCCF) were established as financing mechanisms for the EGTT framework. Since 2001, the EGTT has worked on the development of a technology transfer clearinghouse and collaborated with the GEF on nation-specific Technology Needs Assessments (TNAs) ñthat identify and determine the mitigation and adaptation-technology priorities, particularly of developing countriesò (UNFCCC 2007).

Another significant COP that dealt with technology transfer was COP13, held in Bali (Indonesia) in 2007. Here the Bali Action Plan (BAP), focusing on the four pillars of climate change intervention (mitigation, adaptation, financing, and technology transfer), was adopted. It also sought to establish the framework for a post-2012, or post-Kyoto Protocol, emissions target agreement. COP16, in conjunction with the UNFCCC and held in Cancun, Mexico in 2010, decided to establish a Technology Mechanism (TM) to facilitate the implementation of the conventionôs provisions on technology development and transfer. This decision ñwas the outcome of at least three years of negotiations on ways and means of ensuring that the UNFCCCôs provisions on access to, and transfer of, technology are implementedò (Mugabe 2012: 18). Technology transfer was again discussed at COP17 in Durban, South Africa in 2011, where decisions were taken on the operationalisation of the TM. Mugabe (2012: 18) argues that the relationship between the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN), which are the two bodies created under the TM, was clarified by requiring them to jointly report to the COP. Furthermore, the terms of reference for the CTCN, and the procedures and modalities for the TEC, were also adopted. The refinement of the TM is still a work-in-progress.

Conventions and protocols emanating from discussions and conferences since 1992, focusing on technology transfer, have also not escaped analysis in the IR discipline. As alluded to earlier, the theoretical basis for these analyses is institutionalism, focusing on regimes and, more specifically, on regime effectiveness and regime efficiency. The institutional perspective also attempts to explain issues of sovereignty and the role of non-state actors insofar as they impact, and are impacted by, technology transfer policies and practices.

Having elaborated how issues of technology transfer, including the transfer of ESTs, have been accommodated in the IR discipline, FDI is another area of this study that can be located within the theoretical framework of IR, in particular the sub-discipline of IPE, which prioritises

economic issues traditionally considered as ólow politicsô in IR. In the 1970s, however, as Krasner (1978) explains, profound changes caused by wars in the Middle East, leading to a huge escalation in oil prices, forced IR specialists to give much more attention to international economic issues. But such early analyses proved to be theoretically muddled. During this period, TNCs and FDI were analysed along two schools of thought – the liberal and the critical-Marxist/world systems theory (WST) schools that derived much of their arguments from the transnational relations tradition, a tradition that analyses ñregular interactions across national boundaries when at least one actor is a non-state agentò (Keohane and Nye 1971: xii). At the time, these theories grappled with the question whether TNCs contributed to, or hindered, economic development (Maxfield 2002; Gilpin 1987).

Liberals advanced the modernisation theory (discussed earlier), claiming that TNCs had an overall positive effect on economic modernisation by guaranteeing an open world economy based on free trade and by exporting capital, know-how, and modern values into less-developed countries (Huntington 1968). The technology transfer aspects of this theory have also been discussed earlier and it is not necessary to repeat them here. In contrast to the liberals, there were a number of practitioners and policy-makers who employed the WST, especially the dependency school (already discussed), in order to analyse the economic scourges that afflicted the developing world. The WST impacted on the analysis of FDI in the sense that TNCs were viewed as tools used by the core to exploit countries in the semi-periphery and periphery (Amin 1977; Rodney 1972; Frank 1967). Once seen as instruments of exploitation, the benefits associated with TNC investments were not fully considered. In fact, proposals that emanated from the WST included nationalising many of the subsidiaries of TNCs, delinking domestic industries from any association with the core, and the pursuit of import-substitution mechanisms.

Despite these attacks on TNCs, proponents of the WST realised that the industrialisation of developing countries was an important imperative for development. Technology was viewed as a crucial element in the industrialisation process. But exponents of the WST fought for technology transfer at favourable terms, whilst respecting national sovereignty in the process. Only appropriate technologies should be transferred in a uni-directional process assumed to be from the core to countries in the semi-periphery and periphery. Hence, promoters of the WST did not envisage the transfer of technologies from peripheral or semi-peripheral states to the core. They also analysed ESTs, especially through the pollution-haven hypothesis, discussed earlier.

In time, however, both the liberal and WST IR perspectives on TNCs and FDI started to wane. In the 1990s, the debate about the impact of TNCs on world politics largely concentrated on the developed world in the context of discussions around globalisation and internationalisation (Held *et al*. 1999). The globalisation debate focused mainly on the effects of TNCs (considered as global players) and other transnational market forces on states, in particular the ability of industrialised countries to conduct their own autonomous economic and monetary policies (Cohen 2002). Within the globalisation paradigm, the so-called convergence hypothesis holds that the authority of ñgovernments of all states, large and small, strong and weak, has been weakened as a result of technological and financial change, and of the accelerated integration of national economies into one single, global market economyò (Strange 1996: 13). Stopford and Strange (1991) state that the ability of TNCs to shift production elsewhere, and their capacity as transnational actors to allocate financial and other resources to places promising the highest profit rates, severely circumscribes the autonomy of national governments to take economic decisions. For these theorists, the more a national economy is integrated into global markets, the higher the costs of a national economic policy which is not oriented towards liberalising markets (Milner and Keohane 1996).

Proponents of globalisation offer some important policy insights, especially the analysis the flows and stocks in FDI showing how TNCs are integrated in the world economy. However, the inherent view that technologies have made the world a ñglobal villageò makes any allusion to technology transfer difficult, as this belief prompts an analysis of inequalities and differences in technological capabilities in that óvillageô. Besides its inadequacy in explaining technology transfer, the very notion of globalisation is heavily contested in IR (Beisheim and Walter 1997; Milner and Keohane 1996). However, highlighting such contestation does not fall within the purview of this study.

## 3.3 THEORIES AND CONCEPTS IN THE FRAMEWORK

### 3.3.1 The Interdisciplinary Nature of FDI and the Transfer of ESTs

The study of FDI-carrying ESTs in the African context is of necessity an interdisciplinary one, because no single discipline has an explicit theory that deals with this subject in particular. Rather, some theories that deal with issues of FDI and the transfer of ESTs are found in disciplines such as international business, economics and politics, amongst others. However,

considering that the study of FDI and the transfer of ESTs are focused on transnational issues, this study can be associated mainly with theoretical groundings found in the discipline of IR, especially IPE, with selected concepts and theories borrowed from Economics. From these, a state-centred, institutional, government-imposed distortions (SCIGID) framework is constructed to guide the investigation of the subject matter at hand.

### 3.3.2 Theoretical Building Blocks for the Conceptual Framework

A study of FDI-carrying ESTs in the African can only be successfully undertaken if it focuses on the activities and actions of the sovereign state – its policies and institutions at various levels. The sovereign state alludes to ña system of political authority based on territory, mutual recognition, autonomy, and controlò (Krasner 2001: 229). This is an essentially state-centred approach (Ikenberry 1988), which commonly views the ability of FDI to promote the transfer of ESTs as facilitated or constrained by the capacity of the sovereign state to exercise its sovereignty principles of autonomy, control, and international legal recognition (Krasner 2001). In exercising the autonomy principle, states create legal and policy frameworks, as well as institutional structures, that govern and co-ordinate FDI at domestic level. In employing the control principle, they create rules for the control and movement of capital, such as FDI within and across borders. And finally, in applying the international legal recognition principle, states consent to and sign specific agreements and treaties with other states. Whereas the policy frameworks that arise from the exercise of sovereignty principles can be explicit or implicit, the institutional structures can be direct or indirect.

Sovereign states also intentionally or unintentionally impose inducements or distortions on markets through the policies they adopt. These policy impositions can either facilitate or dissuade inward or outward FDI and include those on exchange rates, wages and labour migration, as well as emigration. In general, government-imposed distortions on markets in the form of tariffs and other trade barriers (such as quotas), as well as non-tariff barriers (such as rules on imports), trigger FDI, as they limit the choices of exporting into protected markets and enhance the choices associated with direct investments. Furthermore, the levying of taxes distorts the market as differentials in taxes act as pull factors that will entice direct investment to countries with lower taxes, in comparison to those with higher taxes. Similarly, the way in which governments craft and impose price and profit regulations, as well as anti-trust laws, amongst others, distorts markets and the context in which FDI may occur.

Sovereign states exercise sovereignty principles and implement inducements or distortions differently and, in relation to FDI, this is primarily based on power as a mediating variable. They mainly employ structural power, defined by Strange (1988: 24) as ñthe power to shape and determine the structures of the global political economy within which other states, their political institutions, their economic enterprises, and (not least) their scientists and other professional people have to operateò. She further observes that ñstructural power, in short, confers the power to decide how things shall be done, the power to shape frameworks within which states relate to each other, relate to people, or relate to corporate enterprisesò (Strange 1988: 25). Moreover, the use of structural power by sovereign states can be either active or passive. It can be assessed through the incentives and barriers that states introduce for FDI, the way they co-ordinate, bargain, synergise and connect domestic policies and institutions, as well as their interaction with international institutions. In this sense, the use of structural power moulds the context in which FDI operates in home or host countries.

In summary, whereas government-imposed distortions on markets are implemented through policy frameworks, institutional structures act as the central defining features connecting sovereignty principles and structural power. Hence, a complementary institutional approach, which ñconceives of the state primarily as an organisational structure, or set of laws and institutional arrangementsò (Ikenberry 1988: 219) is imperative, and the focus will therefore be, more specifically, on the notion of national institutions as impacting on FDI and the transfer of ESTs.

#### *3.3.2.1 National Institutions, FDI and the Transfer of ESTs*

Skocpol (1985) maintains that in recent social science literature, two broad approaches linking the state to policy outcomes have come to the fore. The first approach deals with the state as an actor, but focuses more specifically on the role of politicians, and government officials and administrators as óindependentô participants in policy-making processes. This approach, therefore, separates the personality from the position that that individual occupies in the state apparatus. As such, it deals primarily with the goal-oriented behaviour of people working in the state bureaucracy, in particular the behaviour of politicians and civil servants as they respond to internal and external constraints in an effort to manipulate policy outcomes in accordance with their particular preferences. Thus, bureaucrats are viewed as having their own lives separate from

that of their institutions, but they may also introduce their life choices, interests and preferences in a manner that influences policy outcomes. Ikenberry (1988: 220) notes that an underlying ñpresumption is that these preferences are partially, if not wholly, distinct from the parochial concerns of either societal groups or particular governmental institutions, and are tied to conceptions of the national interest or the maximisation of some social welfare functionò. However, this approach has little to offer to this study as it does not analyse the personal preferences, motives, or actions and inactions of state officials.

The second approach is an institutional one which, as indicated above, ñconceives of the state primarily as an organisational structure, or set of laws and institutional arrangementsò (Ikenberry 1988: 220). Following North (1991: 98), the institutional framework of any given sovereign state consists of two pillars: the formal rules, and the informal constraints and characteristics of enforcing those constraints. Formal rules consist of laws, obligations and rights set by the institutions which influence interaction by forming a framework within which exchange can take place, reducing both uncertainty and transaction costs. On the other hand, informal constraints are norms, values, taboos, traditions, and other informal órules of the gameô. Brinkerhoff and Goldsmith (1992: 371) refer to the foregoing as ñrule-orientedò institutions, sharply contrasting from ñrole-orientedò institutions which are ñorganisations that have attained special status or legitimacyò. This distinction supports the view that a difference needs to be drawn between the institutional environment and institutional (or contractual) arrangements (Davis and North 1971). Whereas institutional arrangements refer to particular sets of rules and structures governing specific contracts, the institutional environment relates to their contexts. The latter consists of general investor rights, enforcement mechanisms and costs, expected forms of human behaviour, power relations, communications infrastructure, and information flows. Nonetheless, the institutional environment, together with particular characteristics of contracted goods or services from the contracting parties, determines both the structure and terms of the institutional arrangements for particular contracts, or sets of contracts, and the processes whereby institutions are subject to change (Dorward 2001; Jaffee and Morton 1995; North 1990).

This study deals with both institutional arrangements and the institutional environment, as the distinction between them is, actually, rather blurred in practice. But the study will mainly focus on role-oriented institutions and pay only passing attention to rule-oriented institutions. Two sets of institutions can be identified: markets, and state institutions. In this study, the market is viewed as a place where private-sector entities are primarily found. From a state-centred approach, the

liberal argument that markets evolve and flourish independently from the state is deemed unattainable. Thus, it is argued, along similar lines to that of Strange (1994: 222), that:

> é it is evident [that] in any market economy, the political authorities take certain conscious decisions about the ends, means and the extent of market regulation and intervention, not only for political distributive reasons but also weighing freedom and growth against risk and instability. There is no such thing in reality as laissez-faire.

The clear point arising from her contention is that state authority is involved in markets; hence, markets should not be viewed as wholly independent, authoritative entities. The intervention of states (governments) in markets is, therefore, considered an imperative in this study. In relation to FDI, interventions by states may contribute towards the creation of durable and favourable investment conditions. In many instances, it may assist in reducing the appropriation or seizure of investments, and help to cut down on technology dumping and other malpractices that may occur when markets are ódeft to their own devicesô. In this study, markets are considered as interlinked and accessible at the domestic, regional, and international levels. The analysis of markets is from a state-centred perspective, because of a conceptualisation that does not fully subscribe to the idea that equity markets in Africa are not fully well-developed and thriving. Moreover, it is argued that the technology transfer that does take place through TNCs occur within firms ï therefore, between parent firms and subsidiaries, as well as through non-market arrangements (Yusuf 2001). Furthermore, TNCs include privately owned firms and some state entities (parastatals) and other firms that are partly owned by governments.

Other types of institutions that this study focuses on are state institutions found at the domestic level – in other words, public role-oriented institutions. In relation to the study, these are institutions created by sovereign states to perform functions associated with either attracting or promoting FDI, or are mandated to deal with regulating and supporting OFDI. State institutions are usually created by an enabling Act of Parliament or a policy, and their mandate is to advance the provisions espoused in the regulatory document. These public institutions have two broad functions: first, governing and co-ordinating the actions of actors in the domestic arena, thus bringing coherence to their interactions; and second, interacting with actors at the international level, whose activities may filter through to the domestic arena (Mugabe 1994). Institutional synergies are key to the proper functioning of state institutions in the domestic sphere. Also, state-level institutions must be able to recapitulate their experiences among themselves and build an understanding of their mutual interests. Thus, sovereign states create autonomous

organisations and policies for control and regulation, which can be helpful in either promoting, facilitating or dissuading FDI flows.

For public role-oriented institutions to perform their co-ordination, control and interactive functions, they should have institutional capabilities of a managerial, technical and entrepreneurial nature in order to undertake FDI activities. In terms of managerial functions, they should organise and manage the personnel and funds for programmes, and be innovatively involved in the promotion of FDI sectors and the state as a good FDI destination or provider. The same managerial functions apply to institutions involved in the transfer of ESTs. Technical functions require institutions to develop management strategies for analysing trends in FDI flows and their impact on the economy, amongst others, and devise models that assist in understanding the effects of ESTs on the economy. Entrepreneurial functions in relation to the transfer of ESTs include forecasting, creative sourcing of technologies, and developing strategies for the effective deployment of technologies and for conducting research and development activities. In terms of FDI, entrepreneurial functions comprise the creation of linkages between foreign and domestic investors.

A domestic or national, state-institutional analysis focuses mostly on those multifunctional state institutions that promote the FDI potential of a country, or of a specific sector in that country. They are known as investment promotion agencies (IPAs), essentially role-oriented institutions, with personnel, budgets and action programmes on how best to market a state as employing ôbest practiceô policies and possessing the appropriate institutions to host FDI. IPAs also influence decision-making processes by recommending policies that would attract FDI. They mainly act as information-providing agencies, thus minimising information-related costs for investors (UNCTAD 2008). Although there has been a mushrooming of IPAs worldwide, and especially since the 1990s in the developing world, there is no concrete evidence of their efficacy in attracting or distributing (outwardly projecting) quality FDI. It seems as though states that instituted IPAs focused primarily on attracting huge volumes of FDI at the expense of quality. Of late though, questions about the quality of IFDI have started to surface in both academic and official discourses (Reel 2010; Alfaro *et al*. 2007). Internationally, the interaction of domestic or national state institutions, such as IPAs, occurs at the regime level. Thus, the concept of regimes as a building block for a conceptual framework has to be explored.

### *3.3.2.2 Regimes, FDI and the Transfer of ESTs*

From a state-centred perspective, states are the main actors involved in regime formation. Porter and Brown (1996: 16) states that the concept of international regime can be defined in two very different ways. First, it is ña set of norms, rules or decision-making procedures, whether implicit or explicit, that produces some convergence in the actorôs expectation in a particular issue areaò. Second, it is ña system of norms and rules that are specified by a multilateral agreement among the relevant states to regulate national actions on a specific issue or set of interrelated issuesò. These definitions imply that states are central to regime formation, and that states use regimes as instruments to minimise transaction costs among themselves. As Keohane (1982: 334) claims:

> é a major function of international regimes is to facilitate the making of specific agreements on matters of substantive significance within the issue-area covered by the regime. International regimes help to make government expectations consistent with one another. Regimes are developed, in part, because actors in world politics believe that with such arrangements they will be able to make mutually beneficial agreements that would otherwise be difficult or impossible to attain.

This study considers regimes as a higher level of organisation external to the state, but created by state institutions. Thus, regimes exist at the regional and international level. The existence of regimes at the regional level brings coherence among actors negotiating, bargaining and advancing their national (domestic-) level interests. Unlike the domestic arena where state institutions co-ordinate, control and facilitate synergies with non-state actors, regimes act as the governing entity at the international level. Hence, they establish óthe rules of the gameô for states to negotiate on an otherwise largely anarchical terrain. From a state-centred perspective, state institutions project the interests of domestic-level actors through the processes of bargaining and negotiation, and also facilitate the harnessing and domestication of regimes into the domestic arena. In this regard, state institutions become conduits that facilitate interactions and óprequentativeô processes between the domestic and international spheres.

International regimes to facilitate the transfer of ESTs already exist at regional and international levels. The most important of these regimes are the Technology Mechanism (TM) under the UNFCCC of 1992 and the Kyoto Protocol of 1997. The TM establishes a technology transfer regime under the UNFCCC and Article 4, Paragraph 5 calls on developed countries to take steps to promote the transfer of technologies to developing countries. Furthermore, Article 4.1(c)

requires all Parties, taking into account their common but differentiated responsibilities, to promote and co-operate in the transfer of technologies, practices, and processes. The cited articles form the regime that ensures that ESTs are transferred successfully among countries and firms, internationally. Mugabe (2012: 19) observes that, for over a decade after the adoption of the UNFCCC in 1992, the contracting Parties have been exploring the mechanisms and institutional arrangements that would make it feasible to implement its technology development and technology-transfer provisions. These mechanisms are constructed by sovereign states in order to provide for conditions for improved interaction through the provision of information, minimising transaction costs, and establishing a clear legal framework for creating sanctions and liabilities for inaction (Keohane 1982). As a regime, the UNFCCC and its TM operationalise the transfer of technologies in the international arena by providing a framework for co-operation.

Other important regimes that have a bearing on the transfer of ESTs in the energy sector include the Kyoto Protocol with its Clean Development Mechanism (CDM) and the Joint Implementation (JI) mechanism. Article 10 of the Kyoto Protocol states that all Parties must take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, ESTs, know-how, practices and processes pertinent to climate change, in particular to developing countries. Articles alluding to the transfer of ESTs under the Kyoto Protocol may have a similar role to play under the UNFCCCôs TM, facilitating inter-state interaction and controls in a largely anarchical world. In summary, the development, progression and linkages of the transfer regime pertaining to ESTs include some ideas developed at the 1972 Stockholm Conference, with further modifications and adaptations made at the Rio Conference of 1992. Various other conventions, such as the 1985 Vienna Convention for the Protection of the Ozone Layer and the Convention on Biological Diversity, should also be viewed as having been influential on the ESTs transfer regime (Mugabe 1994).

Whilst there are regimes to facilitate the transfer of ESTs, this is not the case with FDI. FDI is a highly contentious issue internationally and many practitioners have called for a regime that governs multilateral investments. Several efforts were made, without any success, to fashion a multilateral agreement on investment (MAI) which could have served as an international regime. The MAI was negotiated between and representatives of TNCs under the auspices of the OECD. It was derailed by the effective actions of the transnational civil society through campaigns and lobbying. Without consensus on an MAI, state institutions employ bilateral investment treaties (BITs) as contracts for FDI. Arising from this, there has been a tremendous increase in the

number of BITs signed by countries worldwide (UNCTAD 2014a, 2011, 2010). BITs may be viewed as legal agreements that outline the rights and responsibilities of investors and the recipients of investments, as well as the modalities of dispute settlement. The escalation in the number of BITs is a result of a perception that they can facilitate an increase in inward or outward FDI flows (Neumayer and Spess 2005; Buthe and Milner 2005; Egger and Pfaffermayr 2004). Moreover, BITs have been seen as instruments which could serve as substitutes for the lack of institutional quality, especially in countries where institutions are weak and financial markets are not well-developed (Busse and Nunnenkemp 2008; Neumayer and Spess 2005; Hallward-Driemeier 2003).

Within the BITs are certain provisions that have an effect on the autonomy and control aspects of sovereignty and state institutions. Most BITs contain some embedded clauses that seek recourse to international justice or independent recognised entities in cases of the violation of agreements. Many TNCs have resorted to the World Bank-created International Centre for Settlement of Investment Disputes (ICSID) when they had BIT-related disputes with countries. In cases like these, the ICSID supplants the domestic state institutions, especially domestic legal structures. As the ICSID resides outside the jurisdiction of the state, it cannot be controlled by the state. From the state-centred perspective, states are willing to make such concessions based on the calculation of how best BITs may serve their self-interest: they may raise more FDI or generate more outward FDI; they may be substitutes for weak institutions; and they may enhance the status of states, as the more BITs states sign and agree to, the more investors will hold them in high regard. Thus, states are willing to let their domestic legal structures co-exist with the ICSID as long as this serves the greater good of the state. Since regimes are also found at the international level, it is necessary to examine the institutional arrangements at this level as well.

#### *3.3.2.3 International Organisations, FDI and the Transfer of ESTs*

Whilst regimes and agreements are key in facilitating inter-state interaction at the international level, supporting international organisations are necessary to ease their implementation. International organisations are viewed, to a large extent, as ñcreations of states designed to further é [their] interests and are, therefore, simply epiphenomena of state interactionsò (Barnett and Fennimore 1999: 704). This is a state-centric argument and is also advanced by neo-liberal and neo-realist scholars, who contend that state power and authority may be exercised inside the corridors of international organisations. Thus, international organisations may well serve the

interests of the state. Whilst presenting the state-centred approach, this does not refute the existence of international organisations which are created by non-state actors. Furthermore, it is accepted that there are some state-created international organisations that develop their own measure of autonomy (Keohane, Haas and Levy 1993: 23-24). Several UN agencies present themselves as important international organisations which facilitate the transfer of ESTs, including UNCTAD and the UNDP, whilst FDI is promoted by UNCTAD, the International Chamber of Commerce (ICC), and the World Business Council on Sustainable Development (WBCSD). Indeed, the ICC and the WBCSD have eased the way for the private sector and countries (states) to interact through their participation in international negotiations pertaining to sustainable development and FDI, and also by presenting the position of business in international forums and introducing proposals for possible implementation.

Now that international organisations associated with international regimes have been explored, the concept of nested institutions and regimes can be discussed.

#### *3.3.2.4 Nested Institutions, Regimes and Rules*

The concept of nested regimes and institutions ñfocuses on how é [they] might be reconciled in some type of hierarchical ordering and examines how é [they] are influenced by one anotherò (Aggarwal 2005: 1). This hierarchical arrangement arises primarily from the fact that there are some institutions and regimes that cover a much broader spectrum of issue areas than others. But those with a narrow scope are influenced and affected by those with a much wider scope. For example, national environmental policies and institutions may be considered to cover a much broader spectrum than policies and institutions pertaining to biodiversity. Thus, the latter will be nested in the former. Ostrom (1990: 51) argues that all ñrules are nested in another set of rules that define how the first set of rules can be changedò. She examined how nested rules influence the provision of common-pool resources, particularly in the area of the management of natural resources. Following this, Young (1996) focused on embedded regimes, nested regimes, clustered regimes, and overlapping regimes. The first refer to regimes that draw on the broadest level of international society, while nested regimes are issue-specific (but may draw on these embedded regimes). Finally, clustered regimes refer to what appears to be tactical connections between issues, and overlapping regimes to those that may have an impact on each other. The concept of nested institutions, regimes and rules plays an important part in the analysis of the transfer of ESTs through FDI. By perceiving FDI policies and institutions as nested in other

policy frameworks and institutional structures, the interaction of these with other non-explicit or non-direct institutional and regime arrangements can be studied. This, then, enables the contextual examination of FDI at various levels.

### 3.4 THE SCIGID FRAMEWORK

Having provided these explanations of the building blocks of the SCIGID framework by integrating theories from IPE and Economics, the framework may be summarised as follows:

1) The centrality of sovereign, home and host countries in exercising sovereignty principles of autonomy, control, and international legal recognition, resulting in the creation of explicit or implicit FDI policy frameworks, and direct or indirect institutional structures.
2) Government-imposed distortions on the market by means of specific policies and through the use of incentives and disincentives (barriers).
3) The exercise of structural power by sovereign states noticeable through co-ordination, synergies, bargaining, negotiations, and other forms of interaction at various levels.
4) The exercise of sovereignty principles and structural power by states, as well as the imposition of distortions on markets evident in FDI policy frameworks, institutional structures, and the context within which FDI has to operate.

In order to operationalise these four key aspects of the SCIGID framework, descriptions and explanations of how host and home countries define and shape FDI-institutional and policy arrangements and contexts are of the essence. An analysis at the firm, sector, state/national, and regional/international level has to be undertaken. A domestic-level analysis deals with firms, as well as an energy sector-specific and national investigation into FDI policy frameworks and institutional structures, in particular elucidating institutional synergies and co-ordination. An international-level analysis explains how the state interacts with non-state actors, and harness and domesticate various regional and international FDI regimes in order to promote the transfer of ESTs. Cutting across the domestic and international levels are such aspects as the content, quality and volumes of FDI, the form and nature of ESTs, and the general context and processes associated with the transfer of ESTs.

On the whole, the main components of the SCIGID framework, in its operational form, may be outlined as:

a) FDI: this category includes the type, quality, content, and volumes of IFDI and OFDI. These elements affect the manner in which FDI can transfer technologies, in general, and ESTs, in particular. These features are analysed through a presentation of FDI at national and sector levels, and case studies of firms engaged in FDI.
b) Sector/National Policy Framework: this relates to existing sector and national FDI rules, regulations, legislation, and policies; these can be either explicit and direct, or implicit and indirect. The function of policies is to regulate FDI either through promoting and facilitating, or dissuading it. Policy changes need to be investigated and placed within the wider sector/national context. The FDI-policy cycle, from FDI entry to the FDI environment, is a useful tool and quite effective in analysing FDI.
c) Sector/National Institutional Structures: these relate to the direct and indirect structural organisational arrangements developed to promote and facilitate OFDI or IFDI at sector or national level. Sector/national institutional structures may be either state or non-state; they may also be state-controlled or market-regulated. Institutional structures are best understood by analysing the legislation or policies they advance. In addition, it is important to examine and understand the co-ordination mechanisms and synergies between them. An analysis of the policies employed by a given firm will shed more light on the efficacy of such policies in relation to the transfer of ESTs.
d) Regimes: these consist of regional and international policies and institutions and are found at both the regional and international level; they are the co-ordinating mechanisms of state and non-state actors at these levels. They may also be domesticated or harnessed by states in order to strengthen sector/national policies and institutional structures.
e) Policy and Institutional Nesting: this involves regarding FDI policies and institutions, at all levels, as part of various national economic and development policies. Important is to analyse industrial policies, R&D policies, and science and education policies in relation to FDI and the transfer of ESTs. Such an investigation is essential, because no policy or institution can stand alone without interacting with the broader national policy environment and institutional infrastructure. Naturally, policies interact and even occasionally overlap with others. Nesting provides for an examination of national technological capabilities, and it allows for the spotlight to be turned on the sector and national-level infrastructure for FDI and ESTs.
f) The Peculiarity and Transfer of ESTs: this category analyses the transfer of ESTs, set apart from the general transfer of other technologies. The peculiar characteristics of ESTs, anchored in their positive affect on the environment, guide this analysis. As peculiar technologies, an examination of the contextual factors that affect their uptake is of paramount

importance. Analysing issues of EST transfers through the optical focus of technology leapfrogging, pollution-halos, and cleaner technologies assist in deepening the understanding of these phenomena. In addition, analysing some aspects of technological capabilities illuminate the processes associated with their transfer.

Utilising the SCIGID framework, the transfer of ESTs through FDI may manifest in specific firm and sector/national institutions created to implement different policies on FDI and technology transfer, in particular those on ESTs. The transfer of ESTs through the medium of FDI is further evidenced in the interactions of domestic actors with regional and international actors and regimes. The SCIGID model also highlights the centrality of sovereign states in exercising sovereignty principles, creating FDI institutions and policies, and using structural power to direct FDI and promote the transfer of ESTs.

The utility of the SCIGID framework is justified by the realities that obtain on the African continent, as well as other veracities inherent in FDI and ESTs. First, regardless of several threats to sovereignty, sovereign states remain the prevalent, central authority affecting the various facets of peopleôs lives in Africa, as evidenced by the serious desire of nations to safeguard their sovereignty, as well as the efforts made to prop-up failing states so as to enable them to survive the deleterious effects of various sovereignty-threatening domestic and external factors. Second, sophisticated equity markets are not well-established on the continent and, therefore, do not pose a threat to state authority as yet. However, African governments intervene through various forms of market-distorting mechanisms, ultimately affecting the proper functioning of these immature markets. Third, whilst non-state actors, inter-governmental organisations, and voluntary regulatory agencies influence some of the actions of sovereign African states, in many instances it is still the state that exercises the ultimate decision-making power around the context and arrangements for FDI. Fourth, the formulation of policies and the development of institutions of a socio-economic and political nature remain beholden to the whims of sovereign African states and their apparatuses, which either constrain or facilitate transactions, even in relation to the movement of capital across borders, as in the case of FDI. Fifth, FDI has traditionally gone where the maximum returns on investments can be realised, and the protection and management of the environment have been secondary to the needs of production and profit-making. As a result of this, the transfer of technologies has resulted from TNC investments that are primarily geared towards making profit through higher production. Sixth, upfront costs of investing in ESTs are still high, limiting their uptake. Seventh, some ESTs are still considered immature technologies,

and investors would rather spend their funds on tried-and-tested, mature forms of technology. And finally, TNCs may need state assistance in order to acquire the necessary funding through international regimes and arrangements.

## 3.5 CONCLUSION

This chapter has integrated the state-centred view of IPE and the government-imposed-distortions theory of Economics, as well as institutional perspectives from both disciplines, in order to develop the SCIGID framework. It explained the two levels of analysis (that is, the domestic and international) integral to the framework. Although premised on two levels of analysis, the framework has the flexibility to provide for the specific examination of issues at the firm, sector, state/national, and regional/international levels. It also highlights the fact that it is essential for the domestic and international realms to interact and share their experiences.

The SCIGID framework posits that the exercise of sovereignty principles by sovereign states results in the formulation of FDI policies and the creation of relevant institutions. It also explains that the use of structural power leads to co-ordination and synergies, the reform of FDI policies and institutions, and the imposition of distortions that either facilitates or dissuades FDI. Therefore, in operationalising the analysis of the transfer ESTs through the medium of FDI, the framework stresses that the examination of issues and the descriptions of concepts in this study has to focus on FDI institutions, policies, and state-induced distortions. Furthermore, the framework guides the study in examining FDI-carrying ESTs through the optical focus of the exercise of structural power by the sovereign state.

The next chapter is a presentation of how African states utilise their sovereignty principles in creating incentives and establishing disincentives (barriers), as well as using structural power to direct IFDI towards economic change.

# CHAPTER 4: AFRICAN STATES, FOREIGN DIRECT INVESTMENT AND ECONOMIC CHANGE IN AFRICA

## 4.1 INTRODUCTION

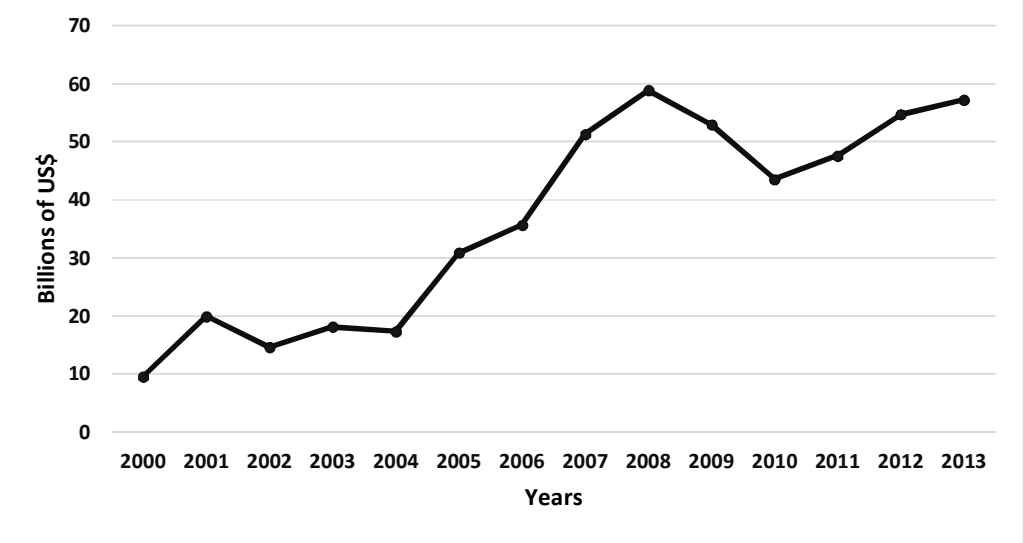
The preceding chapter has highlighted the interdisciplinary nature of this study and elucidated the SCIGID framework that will guide the analyses of issues in this investigation. This chapter examines how African states direct FDI in order to promote economic change. Whilst economic change is a rather elusive concept to define, it encompasses economic (gross domestic product (GDP) growth, capital-formation, firm productivity, trade, the transfer of technology), social (poverty reduction, employment-creation, and human rights), and environmental (pollution, and environmental destruction) components. The chapter specifically analyses the exercise of sovereignty principles by African states, focusing on FDI policy frameworks and institutional structures that have been put in place. It also examines the imposition of market-distortions and the introduction of market-incentives by African governments. And finally, it deals with the use of structural power through an analysis of mechanisms for building synergies and co-ordinating FDI. But first, the situation regarding FDI in Africa will be highlighted.

## 4.2 THE CONTEXT OF FDI IN AFRICA

### 4.2.1 FDI Inflows to Africa

In 2013, FDI inflows to Africa stood at US$57 billion, a 4% increase from the 2012 figure of US$54.72 billion (UNCTAD 2014a). However, an analysis of trends in FDI inflow data from the online United Nations Conference on Trade and Development Statistics (UNCTAD-STAT) up to the year 2013 shows that FDI flows into Africa have gone through several periods of increase and decline. When FDI data became available in 1970, a total amount of US$1.26 billion FDI flows into Africa were recorded. Thirty years later, in 2000, FDI inflows to Africa stood at US$9.94 billion. The situation of IFDI flows to Africa from 2001 to 2013 is shown in Figure 1, which highlights the fact that although FDI inflows to Africa are showing an increase from 2011 to 2014, they still fall short of the 2008 peak. Although FDI inflows to Africa between 1980 and 1999 grew by over 218%, the overall inflows from 1970 to 2010 increased by over 4 000% (Ajayi 2006).

**Figure 1: Trends in IFDI to Africa from 2000 to 2013 in US$ billions**

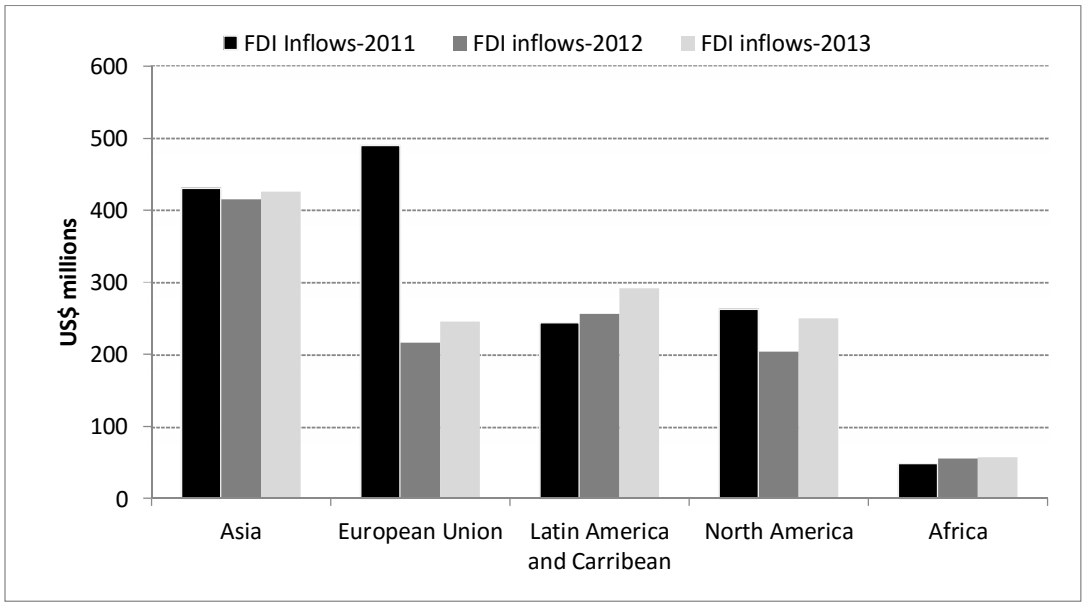



*Source:* Author, with UNCTADSTAT data up to 2013

The generally high volumes of FDI inflows to Africa mean that countries on the continent are doing quite well as far as attracting FDI is concerned. However, the picture is not that rosy if inflows to Africa are compared with inflows to other developing continents. In relative terms, the 218% increase in FDI inflows to Africa between 1980 to 1999 was the lowest in terms of growth in volume when compared to other regions, and whilst ñé in 1970, Africaôs share in é global FDI inflows was 9.5%, it dropped to 4.4% in 2010. Likewise, the share of Africa in developing countriesô FDI inflows was 32.8% in 1970, and it dropped to 9.6% in 2010ò (Mijiyawa 2012: 2).

UNCTAD (2014a) reports that Africa still lags behind other regions as an attractive FDI destination, as shown in Figure 2, which illustrates the relative situation of FDI inflows into the continent against that of other regions for the period 2011 to 2013. Although Africa is richly endowed with many natural resources that should attract foreign direct investment, many writers point to institutional, policy, structural, and infrastructural factors as the reasons behind its failure to draw significant volumes of FDI (Jude and Levieuge 2013; Asiedu 2006, 2004, 2002; Morrisset 2000).

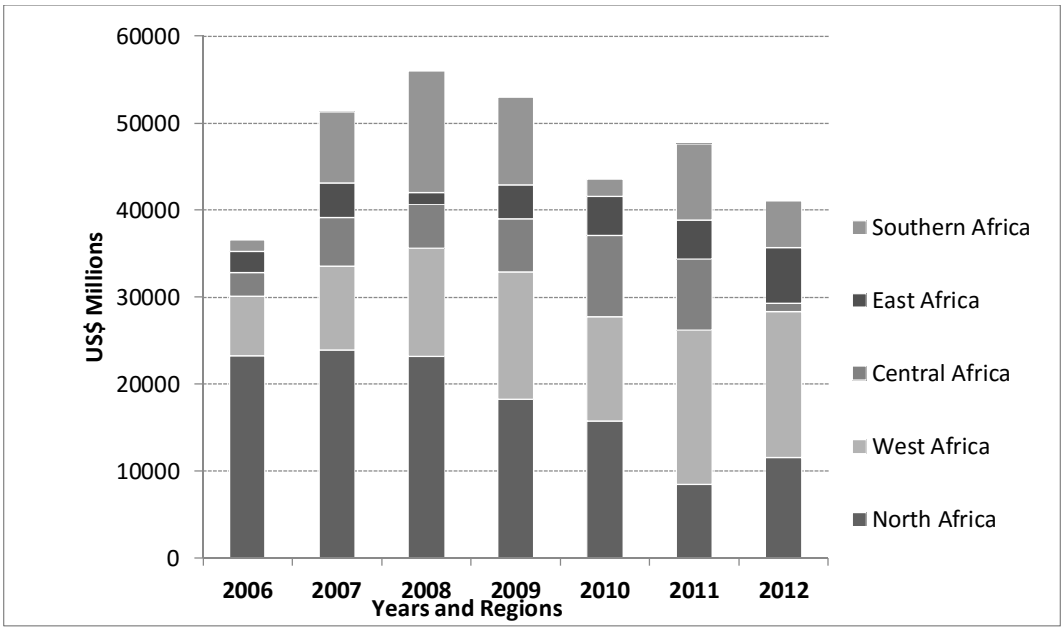
**Figure 2: Africa's FDI Inflows Relative to Other Regions from 2011 to 2013**




*Source*: Author, using data from UNCTAD (2014a)

Moreover, FDI inflows into the various African sub-regions generally vary each year, as shown in Figure 3, which provides a picture of the situation for the period 2006 to 2012.

**Figure 3: FDI into Africa's Sub-Regions from 2006 to 2013**



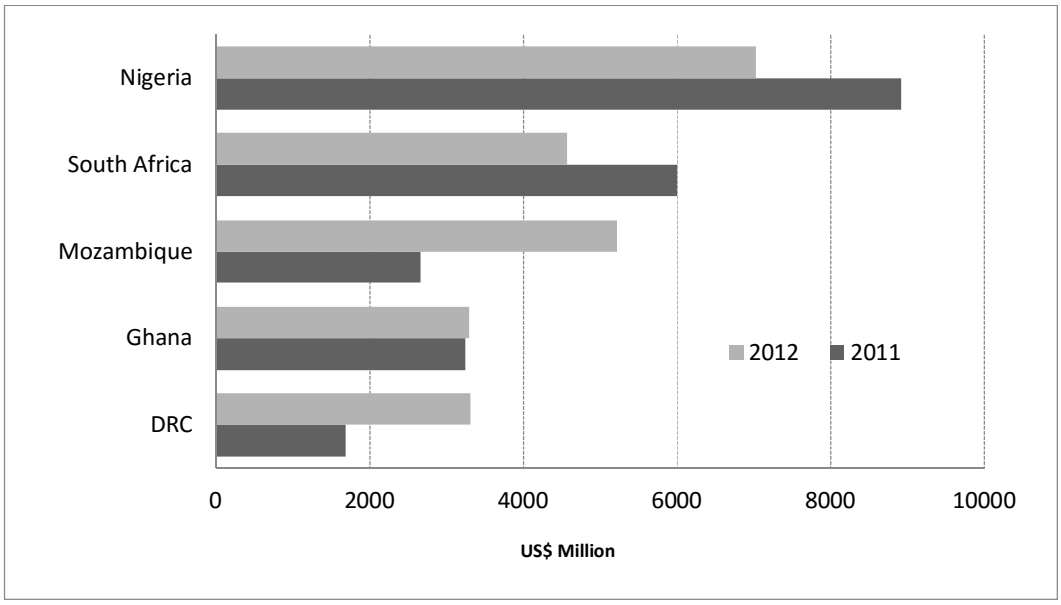

*Source*: World Investment Report, UNCTAD (2013a)

Commenting on the continentôs FDI inflows, Mijiyawa (2012) contends that, since 1970, the North African region has received the highest FDI inflows, whilst the East African region has received the lowest volume among the five regions. Though in 2013, FDI inflows to Southern and Eastern Africa increased, they declined in Central, North and West Africa (UNCTAD 2014a). FDI into North Africa is mainly from Europe, which is in close proximity to the region. Additionally, North Africa has vast mineral and oil resources that makes it a favourable destination for FDI inflows. Although there was a decline in FDI received by this region in 2011 as a result of instability related to the Arab Spring órevolutionsô, inflows to the region increased in 2012, but again decreased by 7% to a total of US$15 billion in 2013 (UNCTAD 2014a). As far as FDI inflows are concerned, Figure 3 also shows that the East African region has performed well below all the others for the period 2006 to 2012. This may be as a result of the policies that countries in the region have pursued for some time, such as socialist policies that were more pronounced in Tanzania (Mijiyawa 2012), and threats of violence (and actual violence) experienced in Uganda, Burundi and Rwanda, as well as the policy uncertainty that still persists in some of these countries. However, in 2013 the region received US$6.2 billion, an increase of 15% over the previous year (UNCTAD 2014a).

The distribution and concentration of IFDI across countries on the continent is not that uniform. Between 1995 and 2001, the annual FDI inflow to sub-Saharan Africa averaged about US$7 billion and was concentrated in three countries: Angola, Nigeria, and South Africa (Ajayi 2006). When the three countries are not included, FDI inflows to the region fall from US$7 billion to about US$2.9 billion (Loots and Kabundi 2012). Therefore, these three countries consumed an average of 41% of FDI over this seven-year period. The 2000 to 2008 FDI-inflows situation remained concentrated in Angola, Nigeria, Egypt, and South Africa (Loots and Kabundi 2012), and FDI inflows came mainly from Western countries, such as the UK and the US.

As shown in Figure 4, the onset of conflict and the resultant instability in North Africa in 2011 caused a shift in FDI-inflow destinations on the continent. For the first time, countries such as the Democratic Republic of Congo (DRC), Mozambique and Ghana gained a place among the top five FDI-recipient countries in 2011 and 2012, thus following South Africa and Nigeria.

**Figure 4: Top African FDI Destinations in 2011 and 2012**




*Source*: World Investment Report, UNCTAD (2013a)

The sectoral penetration of IFDI to African countries is also not uniform. FDI inflows have been concentrated in the extractive industrial sectors and in countries that are naturally endowed with oil, gas and mineral resources. This points to resource-seeking FDI, in particular FDI in the oil, gas and minerals sectors. Thus, UNCTAD (2013a: 3) correctly asserts that ñextractive industries remain the most important driver of FDI to Africaò. Besides huge natural resources endowments, Nigeria and South Africa have also remained the top FDI destinations on the continent, because of their large populations which acts as markets, thus attracting market-seeking FDI. Hence, the comment by UNCTAD (2013a: 3) that:

> é while it is apparent that natural resources are still the mainstay of FDI flows to Africa, FDI in consumer-oriented manufacturing and services is beginning to climb, reflecting the growing purchasing power of the continentôs emerging middle class. Between 2008 and 2012, the share of consumer-related industries in the value of greenfield investment projects in Africa grew from 7 per cent of the total to 23 per cent.

Therefore, Africaôs sectoral allocation of FDI is gradually diversifying, and the continent is realising FDI flows into new areas such as R&D in agriculture, as well as innovations, especially in information communications technologies (UNCTAD 2014a). However, such diversity is still limited to those countries that are able to attract significant volumes of FDI. But, regardless of this, the diversion or re-routing of FDI from the extractive to other novel sectors will definitely

have more than a few impacts on economic change and development in many countries on the African continent.

### 4.2.2 Outward FDI from Africa

Analysing Africaôs outward FDI is a rather complex affair as there is a paucity of literature on the subject. There are also challenges on how to present and integrate the OFDI of African countries inside the continent, as well as investments made by African TNCs out of Africa. To date, there are no studies that clearly demonstrate whether the data they present is on intra-African OFDI, or direct investment made by African TNCs out of the continent. Nonetheless, Africaôs share of OFDI remains the lowest when compared to those of other continents and amounted to 0.4, 0.9 and 0.9 in 2011, 2012 and 2013, respectively (UNCTAD 2014a). The trends in FDI outflows at continental and sub-regional levels over a ten-year period (from 2004 to 2013) are shown in Table 1.

**Table 1: Africa's Sub-Regions, Annual OFDI Flows, 2004 to 2013 in US$ Millions**

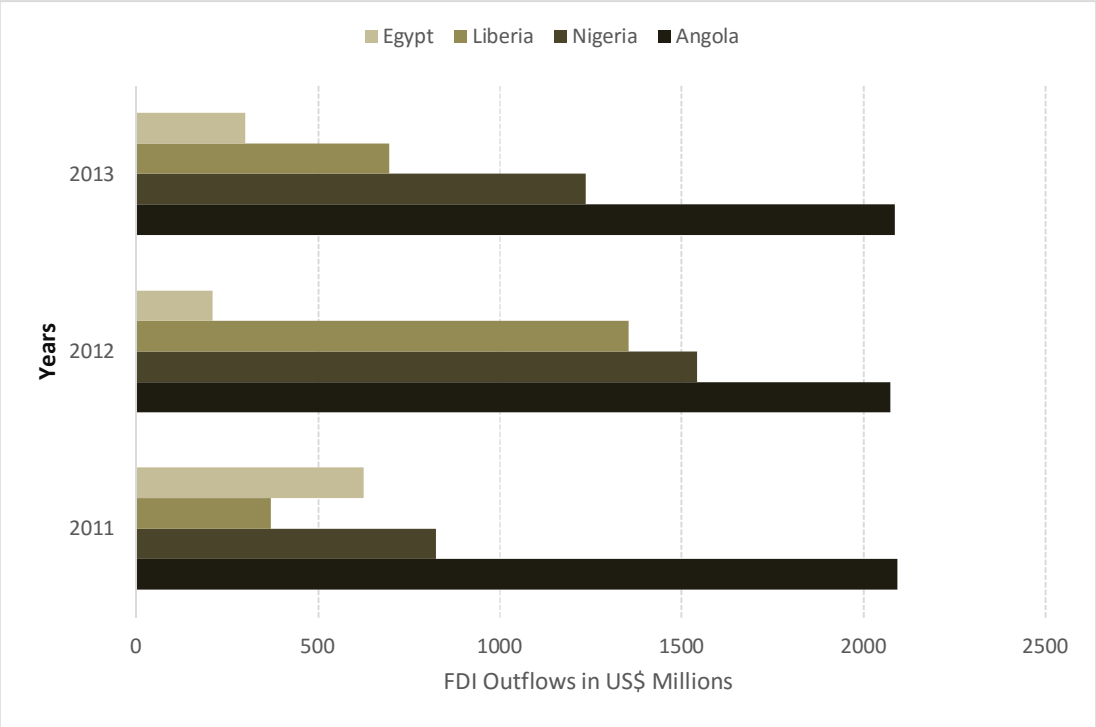
| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| Africa | 2 595 | 1 925 | 7 895 | 9 116 | 4 947 | 6 278 | 6 659 | 6 773 | 12 000 | 12 418 |
| East Africa | 46 | 95 | 48 | 226 | 136 | 360 | 1 320 | 239 | -395 | 416 |
| Middle Africa | -4 | 173 | -68 | -843 | -2 422 | 46 | -750 | 2 459 | 2 963 | 2 707 |
| North Africa | 732 | 289 | 1 142 | 5 415 | 8 752 | 2 588 | 4 847 | 1 575 | 3 273 | 1 481 |
| Southern Africa | 1 289 | 951 | 6 104 | 3 043 | -3 228 | 1 164 | -50 | -231 | 3 003 | 5 629 |
| West Africa | 533 | 418 | 669 | 1 275 | 1 709 | 2 120 | 1 292 | 2 731 | 3 155 | 2 185 |

Source: UNCTADSTATS 2015

In terms of FDI outflows from Africaôs sub-regions, Table 1 also indicates that the Southern African region topped all the other regions in 2006 and 2012, whilst North Africa was leading in 2007, 2008, 2009 and 2010. In 2011, Southern and North Africa had nearly similar amounts of outflows. In addition, Table 1 reveals that West and Central Africa did not have much FDI outflows in 2006 and 2012, and that the East African region does not generally have much OFDI flows.

South Africa has remained the largest contributor to FDI outflows on the continent since 2012, primarily in mining and healthcare products. Figure 5 shows African countries (excluding South Africa) with significant OFDI flows, as well as trends in OFDI flows from 2011 to 2013. It indicates that in 2011, 2012 and 2013, Angola, Nigeria, Liberia, and Egypt were among the top countries on the continent as far as OFDI is concerned. Whilst Egyptôs OFDI are mainly in telecommunications, Liberiaôs outflows are the shipping industry.

**Figure 5: Top OFDI Flows from African Countries, 2011 to 2013 in US$ Millions**




*Source*: Author, with data from UNCTADSTAT

## 4.3 THE EXERCISE OF SOVEREIGNTY PRINCIPLES

### 4.3.1 Explicit Policies and Direct Institutions for FDI in Africa

Many African countries have exercised sovereignty principles by participating in and crafting explicit policy frameworks and direct institutional structures for FDI at the national and international levels. In general, the explicitness of laws and directness of institutions is largely dependent on the capacity of a state or states to individually and collectively articulate their interests to TNCs involved in direct investments. At the national level, policies and institutions for FDI can be either national, sector-specific and, in some cases, firm-specific.

National explicit policies for FDI are generally enacted by an Act of Parliament and are, therefore, evident in the form of broad and all-encompassing laws, rules and regulations. An example is Mozambiqueôs investment legislation, which includes the *Law on Investment* (Law No. 3/93 of 24 June 1993), which explicitly defines the parameters for direct investment, including the creation and entry of IFDI, the sectors where IFDI would be welcome, incentives, and conflict-resolution procedures, amongst other issues. This law is complemented by the *Regulations on Investment Laws*, promulgated in terms of Decree No. 43/2009 of 21 August 2009, operationalising and providing guidance on the practical implementation of the national investment law by outlining all the necessary forms, time frames, and other operational areas not covered at any length in the Act.

National investment laws and policies establish direct national investment institutions for FDI, mainly in the form of IPAs, whose mandate is to provide information to prospective investors, promote a countryôs image to investors, assist in creating conducive policies for investments, and facilitate the review of policies so that they are and remain in line with international, regional, and national ôbest practicesô. In the case of Mozambique, the law establishing the Investment Promotion Centre (CPI), which performs both a regulatory and investment promotion/support function as explicated under Resolution 26/2009, stipulates that the main role of the CPI is the ñdevelopment and execution of measures of promotion and co-ordination of foreign and national investments, including the evaluation, support and monitoring of projects undertaken under the *Law on Investment*ò.

Many IPAs in Africa are one-stop facilities for investors. In 2009, for example, Rwanda established the Rwanda Development Board with the express intention of integrating all government agencies responsible for investor matters under one roof. The board brought under its ambit all key agencies responsible for business registration, investment promotion, environmental clearances, privatisation, and specialist agencies supporting the priority sectors of information communications technology, tourism, small and medium enterprises, and human-capacity development in the private sector. In the same way, the Investment Promotion Centre in Côte dôIvoire (CEPICI) is a one-stop facility for FDI, established in terms of Article 4 of Decree No. 2012-867 of 6 September 2012, with a mandate to ñgather, co-ordinate and streamline all government initiatives and actions on investment promotion and private-sector developmentò (CEPICI 2014).

Other explicit national legislations and direct institutions for FDI are also found in countries such as Chad, where Law No. 006/PR/2008 of the *Investment Charter of the Republic of Chad* (2008) defined the functions of the National Agency for Investment and Exports. Even in the politically fragile Central African Republic, Law No. 01/10 of 16 July 2001 of the *Investment Charter of the Central African Republic* (2001) created a National Commission for Investments. Across these African countries, explicit national legislations have provisions for the entry/creation of investment, the operational treatment of investment, the promotion or facilitation of investment, investment retention and repatriation, and establishing a conducive business climate. However, there is a slight difference between the explicit national investment laws in Francophone and Anglophone African states. Investment laws and policies in the former tend to be aligned to Regional Economic Communities (RECs) and French legal statutes, because France and RECs play an important administrative role in the monetary, trade and investment policies of these countries.

In some African countries, national laws and policies for FDI are supported by explicit sector-specific policies with legal provisions for those economic sectors that states consider a priority for investment. A general analysis of these laws and policies indicate that they are mainly focused on the extractive and service sectors. For example, the *Ghana Investment Promotion Centre Act, 1994* (Act 478) regulates investment in all sectors of the economy, except minerals and mining, oil and gas, economic free zones, banking, non-banking financial institutions, insurance, fishing, securities, telecommunications, energy, and real estate. Similarly, in Botswana, some specialised enterprises such as banking and insurance, as well as business arising from diamond mining, are

licensed by the regulators of those specific industries. In Tanzania, the Natural Gas Policy of 2013 controls many parts of the natural gas value chain and the promulgation of the Petroleum Exploration Policy, the *Natural Gas Act*, the Gas Utilisation Master Plan, and the *Natural Gas Revenue Management Act* will further provide for greater regulation of the sector. Since, in many African countries, sector-specific laws and regulations co-exist with national FDI policies, these cause investment processes to be rather cumbersome as foreign investors are required to satisfy the provisions of national investment acts, as well as the requirements of sector-specific laws.

Sector-specific institutions, in the form of line ministries and government departments, implement the policy requirements enshrined in sector-specific policies. For example, in Zimbabwe, the Ministry of Mines is supported by the Mining Affairs Board and the Zimbabwe Mining Development Corporation, which constitute the direct institutions that deal with FDI in the mining sector as prescribed by the *Mines and Minerals Act* (Chapter 21: 05) and the *Zimbabwe Mining Development Act* (Chapter 21: 08).

Some African countries have introduced explicit policies that assist in attracting FDI to specific projects of national importance, outside the ambit of Companies Acts. Firm-specific policies and laws are enacted to clearly demonstrate ownership arrangements and provide clear guarantees of investor protection, especially with regard to huge investments or investments in strategic sectors. For example, in Chad and Cameroon, Law No. 20/PR/96 of 23 August 1996 and Law No. 96/13 of 5 August 1996, respectively, were promulgated to support the opening of the Chad Transportation Oil Company and the Cameroon Oil Transportation Company. Nevertheless, there are only a few such firm-specific laws on the continent.

Explicit policies for FDI at national, sector and firm level are primarily crafted by state institutions and enshrined in laws, policy documents, guidelines, and White and Green Papers that directly address the processes and procedures for investing in a given country, define the rights of and guarantees for investors, and establish mechanisms for dispute resolution and settlement. However, direct FDI institutions, such as line ministries and governing boards, can be either government institutions, or semi-government, statutory bodies. However, some IPAs are oftentimes constituted by government and other stakeholders from the private sector, as well as from civil society.

The exercise of sovereignty principles by African states transcends the domestic terrain to include the regional and international arenas, where inter-state interactions have created regimes comprising of explicit regional and international policies and institutions. For example, member states of the Southern African Development Community (SADC) have adopted a Finance and Investment Protocol (FIP) to harmonise investment policies at the regional level. FIP provisions are administered and implemented by the SADC Trade, Industry, Finance and Investment Directorate. Although a regional policy instrument, the FIP guarantees international protection for foreign investors in SADC member states. It aims to facilitate the creation of a favourable investment climate within the SADC region, the ñattainment of macro-economic stability and convergence, co-operation in taxation matters, and co-ordination and co-operation on exchange control policiesò (SADC 2014). Thus, the key aim of the FIP is to promote the harmonisation of the investment policies and laws of SADC member states.

In summary, the SADC FIP provides investors with a choice to initiate binding international arbitration proceedings against any SADC signatory state, prohibits the nationalisation of investments, guarantees fair and equitable treatment of investments, allows investors to elevate their disputes with member states to the international arena, initiates arbitration under the ICSID Convention on the Settlement of Disputes between States and Nationals of other States or UNCITRAL (United Nations Commission on International Trade Law) rules, and does not discriminate between investors, regardless of their nationality. In cases of expropriation, the FIP requires signatory states to pay prompt, adequate, and effective compensation to foreign investors.

Within the ambit of the FIP, the region has also produced a SADC Model Bilateral Investment Treaty Template (MBITT). The MBITT, though not a legally binding document, provides some guidance to SADC member states on negotiation options that might have an impact on future investment treaties. Hence, states can choose the provisions they regard as important and include these in the treaties they will be negotiating. However, the FIP and the MBITT are instruments aimed at attracting FDI into the SADC region, and less concerned with outward investments (OFDI) from the region.

Similar inter-state interactions and exercise of sovereignty principles piloted FDI policies and institutions in the Economic and Monetary Community of Central Africa (CEMAC), where an Investment Charter (1999) was enacted in accordance with the World Bankôs guidelines on the

treatment of foreign direct investments. This charter establishes a general framework for the improvement of the institutional, tax and financial environments for companies launching activities in the CEMAC region, as well as principles particularly related to property rights, the repatriation of profits, and investment guarantees.

Inter-state interactions at regional and international level are also found in explicit bilateral investment treaties (BITs), which are instruments signed by many African states with the specific aim of promoting and facilitating FDI. For example, between September 2011 and January 2012, a single BIT was signed between Kenya and Slovakia (UNCTAD 2012a); but, in the period between June and October 2012, UNCTAD (2012b) reported the signing of three BITs between Morocco and Vietnam, Gabon and Turkey, and the Russian Federation and Zimbabwe, respectively. In the period between November 2012 and February 2013, a BIT known as the Foreign Investment Promotion and Protection Agreement, which includes some typical investment protection provisions, was signed between Benin and Canada (UNCTAD 2013b). In addition, between January and October 2013, three of the four BITs reported by UNCTAD (2013c) involved African countries, namely those between Djibouti and Turkey, Guinea and Turkey, and Japan and Mozambique, respectively.

These examples show that even the least-developed countries in Africa have entered into BITs. Therefore, BITs are not only signed with developed countries, but also with other developing countries and countries in transition. Some of the BITs are quite comprehensive, such as the one signed between Libya and the US in December 2013. This Trade and Investment Framework Agreement include the establishment of a joint US-Libya Council on Trade and Investment to address market access, intellectual property rights, and labour and environmental issues. In terms of this Agreement, the Council is also mandated to boost commercial and investment opportunities between the two countries by identifying and working towards removing impediments to trade and investment flows.

The exercise of sovereign state principles through the crafting and signing of BITs is sometimes strengthened and supported by the ratification of double taxation agreements (DTAs). DTAs provide security and stability on issues of taxation, in addition to relief from double taxation by determining that a firm can only be a taxpayer in the country in which its effective management is domiciled. Taxation is an important determinant of FDI, and differentials in taxes can either promote or dissuade investment flows. African countries that have exercised sovereignty

principles and signed DTAs include Swaziland (agreements in force with South Africa, Mauritius, and the UK) and Botswana (agreements in place with Barbados, Mozambique, India, Namibia, South Africa, the UK, Sweden, Mauritius, Zimbabwe, France, Lesotho, Swaziland, and the Seychelles, as well as Zimbabwe – which has, for its part, signed DTAs with Bulgaria, Canada, Germany, Mauritius, The Netherlands, Norway, Poland, Romania, South Africa, Sweden, the UK, France, and Malaysia).

Besides DTAs, African countries have assented to international legal statutes that relate to FDI, in line with the exercise of their sovereignty principles. On 19 June 2013, for example, ñthe Convention on the Settlement of Disputes between States and Nationals of other States (ICSID Convention) entered into force for São Tomé and Príncipeò (UNCTAD 2013b). São Tomé and Príncipe, a small African island state, subscribed to the Convention as it gives confidence to investors that it will respect their investments by adhering to certain international norms. The Convention essentially establishes procedural rules for the institution and conduct of conciliation and arbitration proceedings under the auspices of ICSID, an international entity founded to improve on the security of investments.

Many African countries have created direct national institutions for interaction with international regimes, such as Designated National Authorities (DNAs), established in terms of UNFCCC requirements for attracting IFDI through the Clean Development Mechanism (CDM). Burundi, for example, has crafted the needed policy and institutional structures that facilitate the development of CDM projects. Hence, Burundi Quality Stoves SA has partnered with the UKôs Shell Trading International Ltd to receive CDM credits for a project focusing on improved cooking stoves for Burundian schools. Similarly, the Sugar Corporation of Uganda Ltd has partnered with Shell Trading International on a CDM project that facilitates anaerobic digestion and heat-generation of sugarcane and molasses at the corporationôs plants. The Kenya Electricity Generating Company Ltd has also applied for CDM funding for a 5.1 megawatt (MW) grid-connected wind electricity generation project at Ngong Hills.

Other African countries that have managed to successfully interact with international regimes such as the UNFCCC, and particularly the CDM, include Egypt, Tunisia and Uganda, with projects that concentrated on waste management, landfill sites, and gas capture. These have received carbon funds administered by the World Bankôs Carbon Finance Unit. More recently, Ethiopia, Madagascar and Kenya have been able to build institutions that allow for the access of

funds from REDD, the regime aiming to reduce greenhouse gas emissions from deforestation and forest degradation. Projects from these countries will receive some funding from the Bio-Carbon Fund, administered by the World Bank, and all these projects include the transfer of technologies that may facilitate the transfer of ESTs.

Noteworthy is the fact that explicit domestic policies, direct institutions and international regimes for FDI, arising from the exercise of sovereignty principles, generally focus on IFDI. Therefore, African countries actively regulate IFDI through these policies and institutions.

### 4.3.2 Implicit Policies and Indirect Institutions for FDI in Africa

Generally, African countries have not developed explicit legal and policy frameworks and direct institutional structures for OFDI flows, primarily because they do not generate significant volumes of such flows. OFDI laws in many African countries can be found in foreign exchange laws that are enacted for regulating the movement of capital across state borders, in particular among most Anglophone African countries and, generally, across the RECs in Francophone African countries. In the latter case, exchange rules and regulations are set at the REC level, while individual (state) adjustments are permissible but largely guided by these regulations. Foreign exchange regulations are harmonised among member states in CEMAC, the Southern African Customs Union (SACU), and the West African Economic and Monetary Union (WAEMU).

Generally, exchange control regulations affect OFDI from African countries through their impact on the volumes/total amount of funds that may be transferred outside of a given state or REC, the time frames for transactions to be approved, the repatriation of profits, exchange rates, and re-investments in host countries. These exchange rules and regulations are usually implemented by national and regional central banks. Thus, national ministries of finance and central banks, through their oversight functions on fiscal and monetary policy, are the key direct institutions that deal with OFDI in Africa.

Therefore, African countries involved in OFDI are either completely silent on the matter, or employ implicit policies and utilise indirect institutions for its regulation. Such policies deal, inter alia, with taxes, trade, IPR, customs duties, the establishment of companies, employment

issues, as well as local content laws. The institutions that deal with these matters are indirectly involved in OFDI. Hence, African countries passively regulate OFDI.

## 4.4 GOVERNMENT-IMPOSED DISTORTIONS ON MARKETS AND FDI IN AFRICA

### 4.4.1 FDI Incentives in Africa

African countries provide a basket of fiscal and financial incentives in order to outcompete other states in attracting FDI inflows. Essentially, fiscal incentives are designed to reduce a firmôs tax burden. Countries commonly employ tax incentives, defined as any ñtax provision granted to a qualified investment project that represents a favourable deviation from the provisions applicable to investment projects in generalò (Fletcher 2002). Tax incentives are primarily about differential taxation of investments and fall into six categories, namely reduced corporate income tax rates, tax holidays, investment allowances and tax credits, accelerated depreciation, exemptions from indirect taxes (such as import tariffs on inputs), and export processing zones.

African countries have made all the above tax incentives available to investors. In January 2014, the Republic of Congo enacted Law No. 34/2013, lowering the standard corporate income tax rate from 33% to 30% for taxable profits exceeding CFA1 000 francs (UNCTAD 2014b). Similarly, in 2013, Cape Verde granted a corporate income tax credit of up to 50% for eligible investments made in activities such as tourism, air and sea transportation, renewable energy, and information technology (UNCTAD 2013b). Furthermore, in June 2013, the government of South Sudan officially launched the Juba Special Economic Zone (SEZ), an industrial area for business and investment activities of about 625km² located about 30km from the South Sudanese capital, making various incentives available to firms (UNCTAD 2013c). In the same year, Morocco introduced a temporary exemption on tax contributions from top income-earners and from companies realising large profits, applicable for three consecutive years as from 1 January 2013 (UNCTAD 2013b). Zimbabwe also offers incentives for firms located in the countryôs export processing zones (EPZs), including exemptions from taxes on dividends and royalties fees, tax on goods imported into the EPZs, capital gains tax, surtax, and sales tax on goods and services, as well as fringe benefits tax for the employees of EPZ companies. Moreover, there is a five-year tax holiday and 15% corporate tax thereafter, permission for foreign companies to borrow money locally, and reimbursement of import duties on the exportation of qualifying goods in an unused state, or as inputs in export goods (Zimbabwe Revenue Authority 2014).

Some African countries also provide financial incentives, which consist of direct contributions from governments to firms in the form of, inter alia, grants, subsidised loans, loan guarantees, the participation of publicly-funded venture capital in investments involving high commercial risk, and government insurance at preferential rates. Algeria, for example, enacted a new mining law in January 2014, reorganising the institutional framework for the mining sector and redefining mining contracts. The law provides for any local company with the requisite technical know-how and financial capability to conduct prospecting activities and develop non-strategic resources. However, strategic resources are only to be developed by state-owned enterprises, permitted to sign contracts with third parties who accept that such SOEs will retain at least a 51% share in such projects (UNCTAD 2014b).

Similarly, on 18 August 2014, Mozambique amended a law that allows the government to issue new gas and oil exploration licences. This provides for domestic and foreign operators to form partnerships with the state oil company, and stipulates that 25% of all produced liquefied natural gas (LNG) should go to the domestic market (UNCTAD 2015). Other government-imposed distortions include the actions (on 23 October 2014) of the Zimbabwe Central Bank to remove restrictions on the participation of foreign direct investors on the bond market, aimed at attracting FDI inflows. Previously, foreigners were allowed to subscribe to up to 35% of primary bond issues, and were prohibited from making purchases from the secondary market. Now they are allowed to conduct investments in both the primary and secondary bond markets (UNCTAD 2015).

In this study, both fiscal and financial incentives are considered government-imposed distortions on markets to entice FDI inflows, and the examples have shown that many African countries actively employ these in the belief that they can effectively facilitate increased investments and serve as a catalyst for job-creation (Blomström and Kokko 2003; Bora 2002). That tax incentives may increase investments is not that straightforward and obvious, however, as they may well reduce investments if they necessitate higher tax burdens on others. Moreover, projects may cause a significant loss of revenue if they are concentrated in investment areas that would have materialised even in the absence of such incentives (UNCTAD 2005).

The reasons why incentives are offered vary greatly among African countries. Some countries have granted incentives to TNCs purely because of the fact that their neighbours have awarded

them. This is in line with a policy argument that when a neighbouring state provides incentives, its neighbours should respond in a similar manner in order to remain competitive. This argument views incentives as tools that promote a favourable investment climate. But, whilst this argument may be acceptable, it can also cause óa race to the bottomô for many African countries as they compete amongst themselves, causing a drastic reduction in revenues. Other countries have also used incentives as instruments to promote regional and industrial development. In this case, incentives are offered in order to promote development in particular regions/localities within a country, or to encourage the establishment of specific industries. Used in this way, incentives become tools for redistribution and curbing inequalities, promoting spill-overs, and facilitating economic diversification.

### 4.4.2 Government-Induced Barriers to FDI in Africa

Apart from incentives, African governments have introduced barriers to FDI, including trade barriers (such as quotas), and tariff and non-tariff barriers (such as rules on imports). Horizontal FDI may be driven by either existing trade rules or future protectionist measures. The World Trade Organisation (1996) observes that ña sufficiently high tariff may induce tariff-jumping FDI to serve the local marketò. Zambia, for example, has imposed a 15% export tax on companies that export copper and cobalt concentrates. This intervention is aimed at promoting direct investment, leading to the beneficiation of copper and cobalt inside the country. Thus, the Zambia Development Agency (2013) could report that companies, such as Glencore Xstrata (an Anglo-Swiss commodity trading and mining company), have invested in smelter plants in the country, amongst other reasons, to avoid the 15% export tax.

Government-imposed barriers in the form of a protectionist threat, or actual protectionist measures, may also lead to direct investments because they limit the choices of exports into protected markets and enhance the choices associated with direct investments. For example, realising that the Zimbabwean seed and maize market was protected, American company DuPont invested in the seed market by purchasing a stake in Pannar Seeds Zimbabwe. The new subsidiary, DuPont Pioneer Zimbabwe, has unlimited access to the Zimbabwean market through this direct investment (Chawafambira 2013).

Price regulations imposed by governments also affect FDI in Africa. TNCs normally invest in deregulated markets or in regulated markets where they would enjoy monopolistic benefits. In

Africa, there are circumstances where governments have regulated prices for the benefit of the poor, especially the price of basic commodities, staple foods, transport, and electricity. In some instances, such regulations have encouraged monopolistic direct investments, as exemplified by the regulation of fuel prices in African countries, promoting the continued dominance of a few international oil companies, such as Total and British Petroleum (BP), that can afford to fund the upfront costs associated with investments and sell at set prices that may allow them to realise marginal profits. Similarly, price deregulation may be a reason for direct investments. Energy sector TNCs, for example, have requested the creation of policies that would allow independent power producers and the market to determine electricity prices, before investing in some African countries.

Laws regulating profits are government-imposed distortions that affect direct investments. Profit laws may allow a direct investor to repatriate all profits realised in a host country back to the home country, or restrict the repatriation of a portion of such profits through the reinvestment of some earnings. Some direct investors tend to favour countries that allow the total repatriation of profits, as provided for by investment laws in Mauritius. Similarly, Zimbabwean laws impose no restrictions on the repatriation of proceeds that arise out of investments made after May 1993.

Finally, governments can also impose some distortions on markets through anti-trust laws, commonly known as competition laws, which mainly regulate against market allocation, bid-rigging, and price-fixing practices and, hence, protect consumers. The *Competition Act* of 1 August 2011 in Kenya, for example, promotes competition in the national economy, protects consumers from unfair and misleading market conduct, and provides for the establishment, powers and functions of a Competition Authority (the oversight body which is mandated to implement the Act) and a Competition Tribunal, the first point of reference for aggrieved people with competition concerns. This legislation also regulates mergers and acquisitions of companies in Kenya, disallowing practices that may lead to monopolisation.

The provision of incentives and enactment of barriers is a complex affair, and states have to interact, bargain, and negotiate with international organisations, such as the WTO and the World Intellectual Property Organisation (WIPO). Hence, this study has to turn its focus to the use of structural power by sovereign states as it relates to FDI in Africa.

## 4.5 STRUCTURAL POWER AND FDI IN AFRICA

The intervening variable that defines the outcome of the exercise of sovereignty principles, and the imposition of distortions or inducements on markets, is structural power. This may result from either active or passive regulation of the activities of TNCs by home and host countries. At the domestic level, structural power is evident in the co-ordination of stakeholders and the building of synergies among domestic state actors. In the international arena, structural power manifests itself in interactions that take place among states and between states and non-state actors.

African countries have introduced mechanisms for the co-ordination of FDI that are at times explicitly stated in national policies. These mechanisms ensure that state institutions interact positively with non-state stakeholders. In Côte dôIvoire, the Prime Minister (as head of government) is in charge of the co-ordination of all entities dealing with investment, including line ministries and the CEPICI. In Rwanda, the co-ordination of all investment institutions, including the Rwanda Development Board and government ministries and departments, rests with the President. These examples show that some African states have placed the co-ordination of investment activities in the offices wielding the greatest power in government. This promotes FDI, as it becomes a matter that is on the governmentôs public policy agenda at all times. In performing co-ordination functions, state apparatuses mainly use structural power, allowing for interactions to be made with private sector enterprises and other interested non-state entities.

Structural power is used by states to build synergies that will be to the benefit of FDI. Such synergies between government departments and other state entities are absolutely essential. At the national level, this entails ensuring that proper interactions occur and appropriate linkages are established between existing and future FDI institutions and policies. In order to build policy and institutional synergies for FDI, African states tend to create a ministerial level mechanism, namely a Council of Ministers or a Cabinet Committee on Investments, drawing members from a number of ministries or departments responsible for implementing national and sector-specific investment policies. The *Investment Promotion Act* of 2004 in Kenya, for example, provides for the creation of a National Investment Council (NIC), comprised of Ministers responsible for finance, trade and industry, agriculture, local authorities, planning, tourism and information, the environment, natural resources and wildlife; the Governor of the Central Bank; the Chairman of the Kenya Investment Authority (KIA); and 12 members appointed by the President. The NIC is

chaired by a Minister directly appointed by the President. Through its activities, it creates synergies between national, sector-specific and firm-specific policies, as well as addressing broader issues of investment and economic change and development, as its mandate includes giving advice to the President and the KIA on ñhow to increase investment, economic growth, and promote public and private sector co-operationò (Parliamentary Debates, 2 June 2004: 1 626). In countries like Ethiopia, a Council of Ministers can approve resolutions and decrees (with legal force) as well as policies, all having a direct impact on FDI. The Council of Ministers, for example, adopted Regulation No. 84/2003 on income tax holidays, and is also allowed to award profit-tax holidays to qualifying TNCs for a period in excess of seven years.

Another institution that exercises structural power for FDI in some democratic African countries is the legislature (Parliament, or National Assembly). Ideally, its role is to enact laws and approve legislation for FDI, as well as holding the executive accountable by probing decisions and actions taken, and asking penetrating questions about the inaction of government or the bureaucracy. To exemplify this, the Zimbabwe Parliament, through its Parliamentary Portfolio Committee, has called several ministers and other members of the executive to answer questions about the implementation of policies that affect direct investments, such as the Indigenisation Act, and also investigated corruption allegations arising from direct investments into diamond mining.

In some African countries, Parliament functions as an arbiter between domestic and international policy-making apparatuses. In such cases, the legislature is the institution that assists African countries in harnessing and domesticating international regimes, and to harmonise them with local laws and policies. Thus, the National Assembly debates and approves international regimes, and also modifies and harmonises national and sector policies. In the Republic of Congo, for example, international regimes have to be approved by the National Assembly in order to take effect at the national level; and once a regime has been approved, the legislature has to ensure that national legislation and policies are aligned with it. This practice is similar in many member states of CEMAC. However, sometimes African countries just lack the capacities and capabilities to harmonise their national policies with international regimes.

The use of structural power by sovereign African states is quite evident at the international level through inter-state interactions that promote and facilitate FDI. In the international arena, inter-state interactions have resulted in regional and international regimes that have either been drafted by African countries, or have been accomplished through the active participation of African

representatives. Besides BITs, international instruments developed by African countries have been explicitly focused on trade and, therefore, implicitly deal with FDI. In these cases, structural power is clearly demonstrated in institutions such as the Common Market for Eastern and Southern Africa (COMESA), SACU, the SADC, the Economic Community of West African States (ECOWAS), and the trade and investment policies advanced by these institutions. Of importance is the recent founding of the Tripartite Free Trade Zone, comprised of 26 African states stretching from Cape Town to Cairo.

It is worth pointing out that the exercise of structural power by African countries at the domestic and international levels creates some form of sanity and order among state actors, and between state and non-state actors, as far as FDI is concerned. In addition, interactions that occur at the domestic and international levels sometimes enhance the capabilities of African states to direct FDI to the promotion of economic change.

## 4.6 DIRECTING FDI TO PROMOTE ECONOMIC CHANGE IN AFRICA

Though FDI may have multiple benefits related to economic change, the accrual of such benefits is not automatic; hence, the necessity to manage FDI in a manner that maximises its positive outcomes. In this regard, African states have a crucial role to craft explicit policies and institutions, directing FDI towards the promotion of national development agendas. A cursory analysis of FDI policies and institutions on the continent leads to the conclusion that, for most countries, current FDI policies have to be realigned so that they explicitly direct FDI towards the provision of healthcare, education, R&D, and local development.

However, some African countries have started to devise explicit policies to do just that – to actively direct IFDI towards developmental goals. To demonstrate this point: Algeria has implemented an incentives policy applicable to investments in the poor provinces of ñthe South and the Highlands, including (i) fiscal and para-fiscal exemptions, (ii) incentives in terms of funding, and (iii) incentives in terms of charges related to rental concessions of public landò (UNCTAD 2012a). This explicit incentive policy is deliberately aimed at attracting FDI inflows into these two provinces, specifically directing that FDI towards local development.

Similarly, an increasing number of African countries are crafting and implementing explicit sector-specific FDI policies, including incentives that aim at stimulating sector-specific growth

and, ultimately, development. In 2013, for example, ñCape Verde granted a corporate income tax credit of up to 50 per cent of é eligible investments made in activities such as tourism, air and sea transportation, renewable energy, and information technologyò, and ñGabon reduced the corporate tax rate from 35 per cent to 30 per cent for companies other than those operating in the oil and mining sectorsò (UNCTAD 2013b). These sector-specific incentive policies direct FDI towards the stimulation of growth in these strategic sectors.

Some explicit sector-specific policies have also been employed to direct FDI in providing increased revenues to the state fiscus. In 2012, for example, Zambia increased mineral royalty rates from 3% for base metals, industrial and energy minerals, and 5% for precious metals and gemstones, respectively, to 6%. Similarly, Zimbabwe raised the royalty rates for gold and platinum from 4.5% to 7% and 5% to 10%, respectively (UNCTAD 2012a). These increases in royalties direct FDI towards providing much higher revenues, which can be channelled towards the achievement of national development goals.

Other African countries, such as Zambia, have directed IFDI towards the promotion of national development goals through policies that link IFDI to employment-creation. According to UNCTAD (2013b), ñZambia conditioned the granting of tax incentives to a requirement that investors meet their obligations related to employment-creation for Zambiansò. Such measures assist African countries bedevilled by high unemployment rates to deal with this debilitating problem. Hence, by directing IFDI towards the gainful employment of locals, African countries indirectly deal with poverty alleviation and long-term developmental imperatives.

In the same vein, a few African countries have started to direct IFDI to promote the transfer of technology and know-how, investment in training and capacity-building, and R&D and innovation activities. For example, under the *Finance Law* of 2013, Gabon reduced the corporate tax rate from 35% to 25% for companies in possession of IPR as a way to attract foreign technology companies and stimulate inward technology transfer. Similarly, Mozambiqueôs investment laws direct investments towards broader and sustainable development goals. In this regard, investment laws determine that direct investments eligible and approvable in terms of *Investment Law 3/93* must, in principle, contribute to sustainable economic and social development as defined by a set of 10 criteria, including the development of infrastructure, expansion of productive capacity, job-creation for nationals and skills transfers, export promotion, import substitution, and improved supply conditions for the local market.

Further explicit policies that direct IFDI towards the promotion of economic development on the continent are enshrined in the policies and laws that establish SEZs, as they have a positive impact on industrialisation. The governments of Zambia and Ethiopia have directed Chinese FDI into SEZs, with extremely beneficial outcomes. By November 2009, the Chambishi SEZ in Zambia ñhad attracted 11 companies and US$760 million in investmentò, providing employment to 4 000 workers of whom 80% were Zambian nationals (Brautigam *et al*. 2010: 3). Most companies in the SEZ are manufacturing firms, providing equipment and services to the Zambian mining industry.

Likewise, the Ethiopian government directed IFDI towards promoting economic development through policies that channelled investments to the Oriental Industrial Zone (OIZ). The OIZ has attracted several companies with a number of economic and developmental benefits to Ethiopia. For example, the Chinese Huanjin Group opened its first shoe factory, and has been working towards establishing a US$2 billion hub for light industry manufacturing in the OIZ (UNCTAD 2014a). This ñlarge shoe factory, hiring 800 workers, was operational within three months after é [the] decision to invest in Ethiopia, which could not have been possible if not for the ready space provided by [the] Oriental Industrial Zoneò ï again, an SEZ supported by Chinese state FDI (Shen 2013: 29).

Some African countries have been directing FDI towards economic change by ensuring that these investments are employed in the manufacturing sector of the economy. In order to achieve this, countries have created industrial free zones, with incentives for companies locating there. Mozambique has established industrial free zones (IFZs) and set up an Industrial Free Zone Council. With appropriate policies and this institution in place, it could oversee the largest direct investment project in the countryôs history in 1998 – the Mozal Aluminium Smelter, located in the Beluluane Industrial Park near Maputo. Juma (2011: 85) notes that ñthe Mozal aluminium smelter in Mozambique not only doubled the countryôs exports and added 7% to its GDP, but also created new jobs and skills in local firmsò.

Countries that experience serious problems with dilapidated infrastructure have attempted to direct IFDI towards such development. In the case of Zimbabwe, the government has channelled IFDI by promoting óbuild-own-operateô and transfer arrangements. Through these arrangements, TNCs may enter into contracts with the state or statutory corporations, in terms of which they

undertake to construct infrastructure on behalf of these entities. This entails the right to control and operate such infrastructure for a specified period, after which the contractor will transfer ownership and control of the facility to the state or statutory corporation. Under this arrangement, the TNC enjoys a tax holiday for the first 5 years, and is taxed at 15% instead of 20% for the second five years. These arrangements allow the investor to recuperate the capital it has expended on the project, make some profit, and enjoy the incentives provided by the government. Some TNCs have made use of these ôbuild-own-operateô options and transfer arrangements, including Group Five (a South African construction company), in order to invest in Zimbabweôs infrastructure.

## 4.7 CONCLUSION

This chapter has explored how African countries direct FDI towards economic change. It has shown that inflows of FDI into the African continent are on the increase, but still much lower when compared to those attracted into other parts of the world. In addition, although FDI inflows are still concentrated in the extractive industries, they are gradually diversifying into the manufacturing and services sectors. The study has shown that, in most African countries, FDI is directed and promoted by the state through explicit and implicit policies, and direct and indirect institutions. Thus, in the exercise of their sovereignty principles, African countries shape the regulations and agencies that affect the structuring of investments, the operational treatment of investments, the promotion or facilitation of investments, and the creation of a conducive business climate for investments. Occasionally, they also participate in international regimes that govern certain aspects of FDI.

The chapter has also shown the role played by African countries in providing incentives for, and creating barriers to, FDI. These incentives and barriers are aimed at facilitating the flows of IFDI into the continent. It has also examined the use of structural power, specifically pointing out how African states co-ordinate with other actors and build synergies that catalyse IFDI at national and international levels. It has zeroed in on the various policies that some African countries are implementing in order to direct IFDI towards economic change. Whilst these policies are still in their infancy and rather diffused, their endorsement shows that African states are moving positively towards directing IFDI to promote and facilitate economic change. However, regrettably there are not yet any efforts to direct OFDI to promote economic change in Africa.

This chapter focused mainly on the broader African scene. It did not address in any detail country-specific aspects in relation to FDI and the transfer of ESTs, such as FDI inflows at national and sectoral levels, specific national policy and institutional frameworks for FDI, and whether, how, and when they promote the transfer of ESTs. The next two chapters will, therefore, focus on these aspects. The next chapter, specifically, will examine IFDI inflows and transfer of ESTs in Angola.

# CHAPTER 5: ENERGY SECTOR INWARD FDI AND THE TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGIES TO ANGOLA

## 5.1 INTRODUCTION

The last chapter has illuminated how African countries direct FDI in order to stimulate economic change. It has highlighted that explicit policies and direct institutions and incentives for FDI, as well as co-ordination and synergy-building efforts, are primarily aimed at IFDI, not OFDI. Hence, African countries actively direct IFDI to promote economic change.

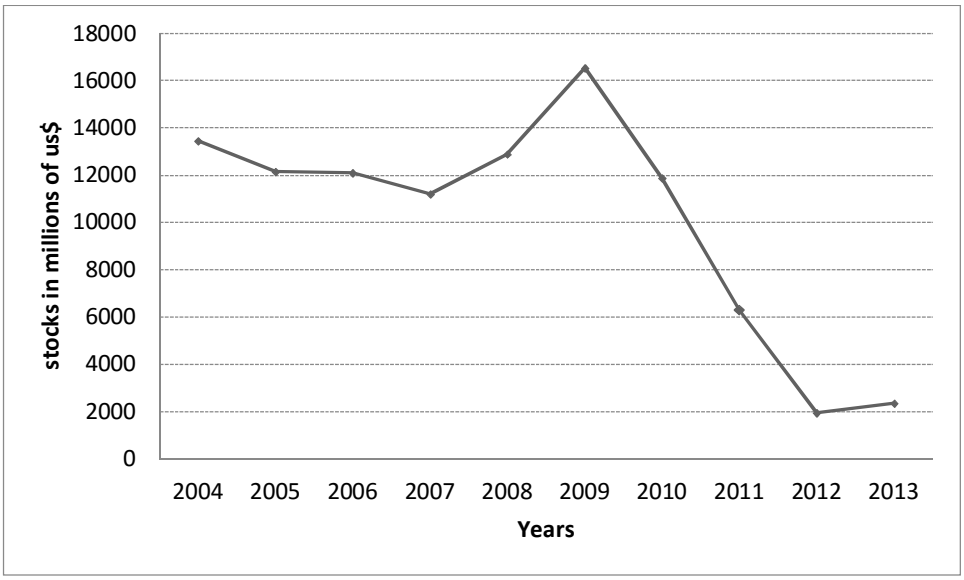
This chapter explores IFDI to Angolaôs energy sector and the transfer of technologies, in particular ESTs. It specifically analyses the centrality of the Angolan state in shaping policies, laws and regulations, as well as in creating institutions for IFDI to the energy sector. It also examines government-imposed distortions for IFDI to the energy sector, and investigates the mechanisms for building synergies and co-ordination among various energy-sector actors at the domestic and international levels, indicating how these stimulate the transfer of ESTs through IFDI. Finally, it presents energy sector-specific and energy TNC case studies that illuminate FDI-carrying ESTs in the energy sector in Angola.

## 5.2 THE CONTEXT OF IFDI AND ANGOLA'S ENERGY SECTOR IFDI

### 5.2.1 National Trends in FDI Stocks and Flows into Angola

There are significant fluctuations in Angolaôs IFDI stocks and flows. The trends in the countryôs IFDI stocks over a 10-year period, from 2004 to 2013, are presented in Figure 6, which shows that Angolaôs IFDI stocks increased after the turn of the century and the end of the 27-year civil war in 2002. IFDI stocks minimally decreased between 2004 and 2006, and then sharply increased from 2007 to 2009. However, the global financial crisis resulted in Angola experiencing a sharp decline in IFDI stocks from 2009 to 2012. But the country has again experienced some positive improvements in FDI stocks during 2012 to 2013.

**Figure 6: Inward FDI Stocks to Angola from 2004 to 2013 in US$ Millions**

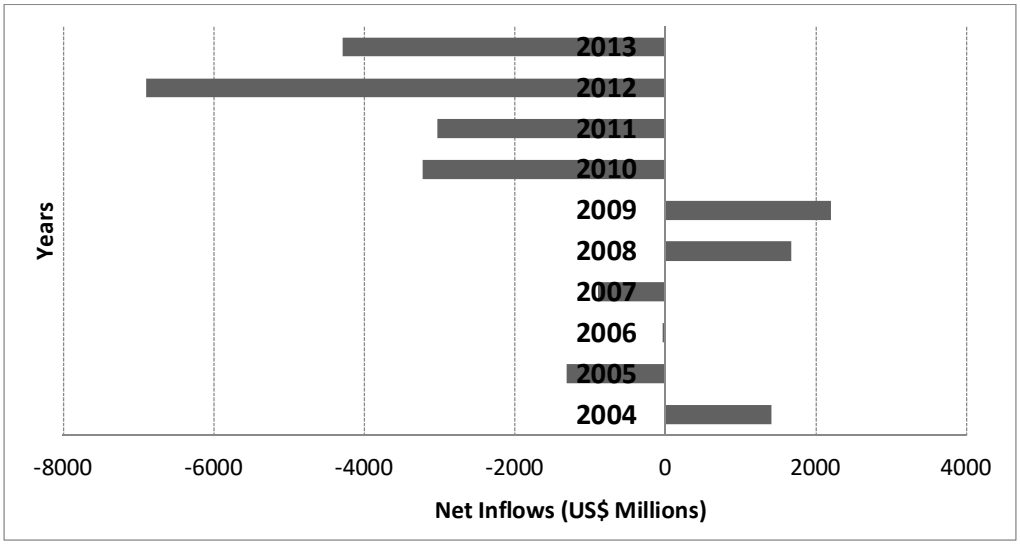



*Source*: UNCTAD World Investments Reports 2010, 2011, 2012, 2013a & 2014a

In terms of FDI inflows, national trends are not easily discernible. Although the country attracts huge volumes of gross FDI inflows, large divestments and repayments of intra-company loans by investors, and the repatriation of income (profits) have made the net IFDI flows insignificant. In this regard, though Angola attracted US$6.80 billion and US$9.06 billion in 2004 and 2005, the net IFDI flows for these years was US$1.3 billion and US$0.038 billion, respectively (UNCTADSTATS 2014). UNCTAD (2012) further reports that the country attracted FDI inflows worth US$10.5 billion in 2011; although in net terms, divestments and repatriated income (profits) left the inflows at -$5.59 billion, a decline of over US$2 billion from the previous year.

The highest net FDI inflows that Angola received between 2004 and 2013 were US$2.2 billion in 2009. UNCTAD (2011: 41) observes that FDI inflows into the country fell by 15% in 2010. Although this was a large decline, the gross ñinflow levels achieved in 2008 (US$16.6billion) and 2009 (US$11.7 billion), when there had been major investments in oil and agriculture, were perhaps not sustainable, considering that inflows to Angola had been just US$5 billion in 2003 when the war endedò.

**Figure 7: FDI Net Inflows to Angola from 2004 to 2013 in US$ Millions**




*Source*: UNCTADSTATS 2014

Even though Angola is still experiencing declines in its FDI net inflows, these have not been as huge as before, as indicated in Figure 7. Thus, UNCTAD (2014a) reports that although the country suffered a US$2.6 billion reduction in divestment in 2013, this was at a lower rate than in previous years. Significant FDI net inflows are caused by divestments, the repayments of loans, the repatriation of income (profits), the legal demand that foreign investors should partner with local partners, the lack of diversification in IFDI attracted, and the absence of new sources of IFDI. Hence, even though Angola attracts huge sums of gross IFDI, its financial system and infrastructure creates bottlenecks, impeding the volumes of inflows – causing the country to record insignificant net FDI inflows.

Direct investment inflows to Angola are either into greenfield investments, or mergers and acquisitions, as shown in Table 2. Based on the number of investments made, it additionally indicates that more IFDI flows to Angola over this period went into greenfield investments compared to mergers and acquisitions. Furthermore, mergers and acquisitions that were successfully negotiated over this period were less in value compared to those of greenfield investments. Nevertheless, these types of investments (whether greenfield, or mergers and acquisitions) are important in the context of the socio-economic development of Angola.

**Table 2: Numbers and Values of IFDI Flows to Greenfield and Mergers and Acquisitions**

| Year | Mergers and Acquisitions | | Greenfield Investments | |
|---|---|---|---|---|
| | Number | Value (US$ Millions) | Number | Value (US$ Millions) |
| 2001 | 1 | 19 | - | - |
| 2002 | 2 | - | - | - |
| 2003 | - | - | 16 | 14 624 |
| 2004 | 1 | - | 17 | 13 934 |
| 2005 | 2 | 175 | 18 | 583 |
| 2006 | 2 | 1 | 15 | 2 549 |
| 2007 | 1 | - | 10 | 8 138 |
| 2008 | 2 | -475 | 32 | 11 204 |
| 2009 | 5 | - 471 | 34 | 5 536 |
| 2010 | 1 | 1 300 | 35 | 1 147 |
| 2011 | - | - | - | 305 |
| 2012 | - | - | - | 3 022 |
| 2013 | - | - | - | 552 |

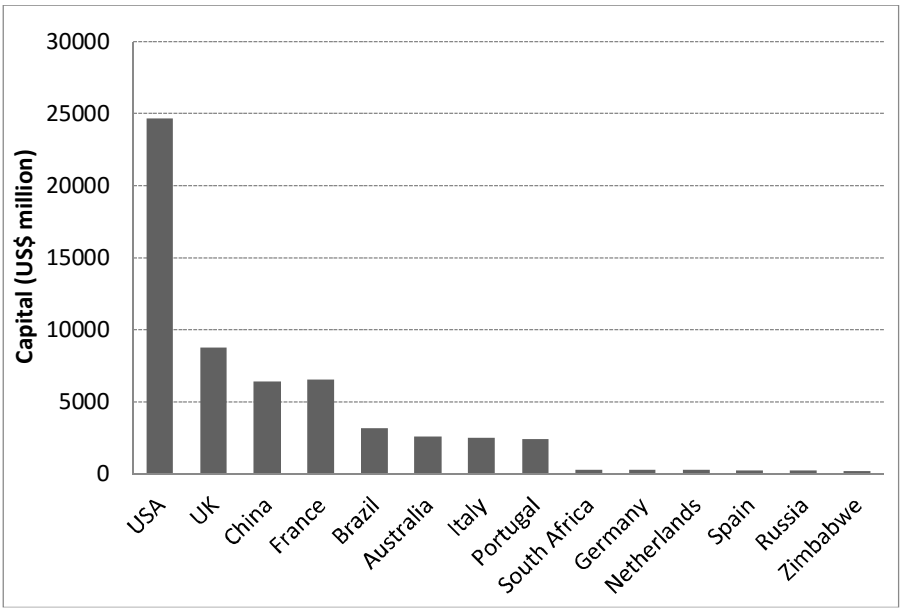
*Source:* Ernst and Young, (2013)

Before 2004, the sources of IFDI to Angola have primarily come from countries in the developed world. However, there have been some significant investments from China from 2004 onwards. Chinese investments are quite complex as they straddle the thin line between direct investments and loans. Therefore, current FDI inflow sources may be viewed as rather diversified, constituting sources from both the developed and developing world. Also, there are not many African countries that have significantly huge investments in Angola besides South Africa and Zimbabwe, as shown in Figure 8.

Investments from Portugal into Angola, presented in Figure 8, needs some elaboration as there are many historical and colonial ties between the two countries, and Portugal is home to many TNCs that have invested in Angola. According to the South African Institute of International

Affairs (2011), Angola was ñPortugalôs 11th destination for FDI in 2002, with [some] EUR50 million. Six years later, in 2008, these numbers peaked to an all-time high of EUR775 million. This decreased to EUR693 million in 2009 and to EUR226 million in 2010, again due to the Portuguese debt crisisò.

**Figure 8: Top Source Countries for IFDI Flows to Angola from 2003 to 2011 in US$ Millions**




*Source*: Ernst and Young 2013

### 5.2.2 Angola's Energy Sector

The energy sector in Angola comprises of operations and activities in oil and gas; in renewable and non-renewable, alternative sources of energy; in electricity generation; in relevant supply chains and consumption; and in many other associated undertakings. This implies that the energy sector is composed of many sub-sectors. However, the most dominant sub-sector within the energy sector is oil and gas, involving a number of domestic and foreign investors. Within government there are also several entities that advance their interests in this sub-sector. And, naturally, the oil and gas sub-sector has historically received the lionôs share of IFDI flows to the energy sector.

### 5.2.3 IFDI to the Energy Sector in Angola

Although Angola was mainly an agriculture-based economy during the colonial era, the country has since transformed itself into a more diversified economy anchored on proceeds from the energy sector, especially oil and gas. Therefore, Angola currently receives significant sums of FDI inflows into oil and gas and the energy sector, far outpacing direct investments into other sectors. IFDI into the energy sector in Angola can be regarded from the vantage point of two different periods ï the one prior to 2004, and the other since 2004. As such, an interviewee from the Angola National Private Investment Agency (ANIP) stated:

> The civil war ended in 2002. The government quickly moved to focus on development, and among the key sectors to be modernised was the energy sector. Several actors were approached between 2002 and 2003. A breakthrough came in late 2004 by way of a Chinese loan. We can, therefore, see the era before 2004 as an era where not much was done to attract IFDI to the energy sector, and the period post-2004 as a period of sudden increase in direct investments (ANIP Interviewee, 14 July 2014).

FDI inflows into the energy sector in Angola before 2004 have mainly been from developed countries, driven by firms from the US, the UK, France, Spain, Denmark, Italy, Norway, and The Netherlands – in particular, oil and gas firms, such as Chevron, BP, Total, ExxonMobil, Cobalt, Tullow, Vaalco, Maersk Oil, Eni, Statoil, Repsol, and Shell. In the post-2004 period, however, an increased number of companies from the developing world and emerging markets are making direct investments in Angola, including firms such as Sinopec, SSi and Sinomach from China, Tenenge and Petrobras from Brazil, and Pluspetrol from Argentina. Although TNCs from developing countries and emerging markets have made direct investments in Angolaôs energy sector, empirical data on, or evidence of, IFDI by African TNCs into this sector is still largely lacking.

During the pre-2004 period, direct investments into the energy sector of Angola have been less diversified and more concentrated in oil and gas. However, FDI inflows started to diversify to renewables, alternative energy sources, and non-renewables after 2004. Whereas diversification into non-renewables is through TNCs involved in the exploration and mining of coal and the production of charcoal, diversification in hydro-power mainly takes place through a shift from huge hydro-power projects to direct investments in mini-hydro-power schemes that are still in their planning phases. Increased direct investments have also been attracted into renewables and

alternative energy sources such as photovoltaic solar, thermal solar, bio-mass, and wind. In terms of wind and solar energies, the contract for the development of a wind-energy and solar-radiation resource map of Angola has been awarded to a Spanish firm, Ereda, and the government has announced that the countryôs first wind-power park will be constructed at Tômbwa in the Namibe Province.

Likewise, direct investments into photovoltaic energy have also been on the increase, especially as off-grid, small-scale solutions, targeting rural public facilities such as clinics and hospitals. The UK-based Fortune CP, for example, has been involved in the implementation of solar-power systems in collaboration with the Ministry of Health in 10 rural clinics in Huila Province. Moreover, there have been some recent investments in bio-energy. In 2008, the Portuguese conglomerate Eurico Ferreiraôs renewable energy subsidiary, Proef, announced that it was pursuing a US$200 million, 30 000 hectare sugarcane project in the Zaire Province for the production of ethanol. However, ironically, there was by that time an existing large-scale project, Biocom (see Box 1), which had already started to produce ethanol from sugarcane.

Although there has been huge investments in hydro-power involving renovations to existing hydro-power plants, expanding existing plants, and exploring new mini-hydro-power schemes, most of the investments into huge hydro-power schemes are not purely IFDI, as the project owner is usually the sole state-owned enterprise, *Empresa Nacional de Electricidade de Angola* (ENE). ENE has been contracting engineering, procurement, and construction management (EPCM) firms as service providers, not direct investment partners. As such, an African Development Bank (AfDB) interviewee commented that:

> é we cannot currently talk of significant tangible IFDI into hydro-power generation projects in Angola *per se*. The country has to promote the participation of private sector entities in power generation through laws that allow independent power producers to invest in this sector. The current legal framework does not promote this, although a few investors have been given permits to invest (Interview with AfDB Official, 15 April 2014).

IFDI to the energy sector has gone into project exploration, project construction or development, and project operations or production activities. An ideal exploration activity would involve the Angolan government, through the Ministry of Petroleum (MINPET) and the state-owned enterprise (SOE) Sonangol, working with a TNC in exploring the feasibility of profitably investing in a proposed project. During the exploration phase, MINPET and Sonangol can be the

contracting party to, or the approving agency for, a submission made by a TNC. As exploration activities generally involve huge capital investments, they are mainly financed by the government or an interested TNC. Financial institutions come on board when the project has proven bankability. In Angola, exploration activities are mainly in onshore and offshore oil and gas fields; as such, Sonangol with China Sonangol has conducted exploration activities in the Cabinda North block, whilst the Cabinda South block has initially been explored by the Australian Roc Oil Company, later taken over by Pluspetrol Angola, a subsidiary of the Argentinian group, Pluspetrol, with Sonangol and Cubapetroleo as partners.

IFDI to the energy sector has also been in the project construction or development phase. This usually takes place once the exploration phase has proven the project viable and profitable. At such a stage, an ideal energy sector, FDI-based project in Angola would have the following actors:

1. *Project Owners*: these are TNCs which have more than a 10% equity share in an energy project. Projects in the oil and gas sector in Angola involve several international firms through the ownership of shares in a single project or a number of projects. An example is Biocom, whose ownership structure is explained in Box 1.

**Box 1: Project Owners of Biocom**

In the Biocom bio-energy project, a 40% equity share is owned by the Brazilian firm, Odebrecht, a 40% equity share by the Angolan company Damer Industria SA, and 20% by the state-run petroleum company, Sonangol Holdings EP. These companies are the owners of this project with a start-up budget of US$258 million, financed by the Angolan Foment Bank (BFA) and Bank Espírito Santo (BESA), with the participation of Brazilôs State Development Bank (BNDES). The project is spread over a total area of 30 000 hectares in Casuzo in the Malange Province, and aims at generating an expected 30 million litres of ethanol, 250 tonnes of sugar, and 160 000 megawatt-hours of electricity annually.

Since the Brazilian firm, Odebrecht, has a 40% equity share in the Biocom project, it meets the FDI-definition requirement of 10%, thus qualifying its investment as IFDI into Angola.

2. *Engineering, Procurement, and Construction Management (EPCM) Firms*: these are international and local firms which are contracted by project owners to construct and develop an energy project. Due to the complexity of most of the projects in the energy sector in Angola, EPCMs have primarily been large TNCs from developed countries, such as the US,

the UK, Spain, Italy, Denmark, Sweden, and Germany, and from the emerging world, such as China, Brazil, Argentina, and South Africa, with very little involvement of domestic or local companies. EPCM firms in Angolaôs energy sector include Odebrecht Oil and Gas, Andrade Gutierrez, Queiroz Galvão, Camargo Corrêa, and ConocoPhillips. These EPCMs sometimes also contract original equipment manufacturers (OEMs) or their designated local dealers, such as *BarloWorld Equipamentos Angola*, to supply them with the necessary tools and implements.

3. *Project Funders*: these are banks and financial institutions that provide funding to project owners for the construction and development of their projects. Much of the capital for projects in the energy sector comes from the US, the UK, China, and Brazil. Russia has also established a local bank in Angola, focusing on providing capital for energy sector and other investments. Other project funders include Standard Chartered Bank UK, Standard Bank de Angola, AfDB, and the Development Bank of Southern Africa (DBSA).
4. *Training and Advisory Services Firms*: these provide training, legal, financial, advisory services associated with safety, health and the environment (SHE), and environmental impact assessments. Training and advisory services firms are engaged by project owners and also by the EPCMs. An example of a training and advisory services firm that has conducted several energy sector projects for government and the private sector in Angola is the Portuguese company, *Consultores de Engenharia e Ambiente SA* (COBA).

The project operations or production phase follows the construction phase. During this phase, a management structure conducts the day-to-day running of operations. Whereas the activity of an EPCM is limited to maintenance, repairs, and the troubleshooting of technical problems encountered during production, training and advisory services firms continue to provide various services associated with production and SHE. At this stage compliance with laws and policies on the training of staff and SHE, amongst others, is of paramount importance.

## 5.3 POLICY FRAMEWORKS AND INSTITUTIONAL STRUCTURES FOR IFDI

### 5.3.1 Explicit Policies and Direct Institutions for IFDI to the Energy Sector

The sovereign state of Angola has exercised sovereignty principles, thereby crafting explicit national, sector-specific, and firm-specific policies and institutions that actively facilitate and promote IFDI to the energy sector. The state has created direct national institutions, besides the

Presidency, the *Agência Nacional para o Investimento Privado* or Angolan National Private Investment Agency (ANIP), the Ministry of Finance, and *Banco Naçional de Angola* (BNA) to facilitate and promote IFDI to the energy sector. Although ANIP is established under the *Private Investment Law* (Law No. 20/11 of 20 May 2011) and serves as the Investment Promotion Agency (IPA) for Angola, its role and that of the private investment law is minimal as the state has crafted explicit sector-specific policies and sector institutions for the energy sector.

Direct institutions created by the state for the energy sector include those for the power sub-sector. These are the Ministry of Energy and Water (MINEA), which is responsible for policy development, co-ordination and oversight in the power sub-sector (electricity), and a national regulatory agency, the *Instituto Regulador do Sector Eléctrico*, which determines rules and regulations on electricity tariffs, private investments, electricity provision, and electricity concessions. These institutions collaborate with the Ministry of Finance, which sets electricity tariffs, and the Ministry of Planning, which is involved in the development and implementation of electricity policy and regulations. The Angolan state has also introduced explicit policies that govern the power sub-sector. In this regard, the *General Electricity Law* of 1996 (currently under review) is the guiding legal statute in terms of electricity or the power sub-sector, allocating powers to grant concessions to the Council of Ministers and the issuing of licences to provincial authorities.

The state also established sector-specific SOEs for the power sub-sector, including the power utility company, the *Empresa Nacional de Electricidade* (ENE), which manages the transmission network and operates over 80% of power-generation facilities and distribution systems outside of Luanda, and the *Empresa de Distribuição de Electricidade* (EDEL), which manages power-generation and distribution in Luanda, as well as the *Gabinete de Aproveitamento do Médio Kwanza* (GAMEK), which facilitates the design and development of large hydro-power projects in the Kwanza River Basin. As such, the AfDB (2014) observes that the ENE, EDEL and GAMEK form a vertically integrated market structure, albeit with significant overlaps in their objectives and no contractual and commercial agreements. Realising this and recognising that the power sub-sector lacks a clear regulatory framework, capacities and skills to manage its operations effectively (AfDB 2014), the government has initiated reforms to the power-sector governing laws and statutes and crafted several policy documents to guide the restructuring process, including the Power Security Strategy and Policy (NESSP 2011), the Electricity Sector

Transformation Programme (PTSE), the Energy and Water Sector Action Plan for 2013-2017, and the National Development Plan 2013-2017.

National institutions, such as the Presidency, ANIP, the Ministry of Finance, and the BNA also actively facilitate and promote investments into the oil and gas sector, guided by the Constitution of the Republic of Angola, which bestows on the state ownership of all natural resources, including oil and gas. These institutions have created explicit sector-specific policies and institutions for the oil and gas sub-sector. In terms of these policies, the *Private Investment Law* (Law No. 20/11 of 20 May 2011) is only applicable to the oil and gas sub-sector in cases where the *Petroleum Act* (Act 10/04 of November 2012) is silent. Thus, the Petroleum Act is the key, explicit oil and gas sub-sector-specific legislation enacted by the Angolan state to actively guide IFDI to this sub-sector. Other explicit sub-sector-specific policies endorsed by the state include the Petroleum Operations Regulation (Decree 1/09 of 27 January 2009), and Resolution 17/01 of 12 October 2001, which declares the delivery and storage, the processing and production, as well as the commercialisation of LNG to be of public interest.

The direct oil and gas sub-sector institution which is responsible for the implementation of the provisions of these policies is the Ministry of Petroleum (MINPET), also in charge of policy development and co-ordination. MINPET is authorised to award licences to direct investors for prospecting, exploration, appraisal, development, and production of crude oil and natural gas, based on the financial and technical capacity of the applying investors. Prospecting licences give limited prospecting or production rights to investors, since the state retains control over the output of these activities. Thus, data collected during the prospecting exercise may be sold to the state, or any other firm, if the state deems it necessary. In addition, MINPET directly administers sector-specific environmental legislation in the oil and gas sub-sector. These include the Joint Executive Decree No. 140/13 on environmental licensing fees for the oil industry, and Decree No. 39/00 of 10 October 2000 on Environmental Protection for the Oil Industry (PIEPD), both of which regulate the environmental practices of the oil industry in Angola.

The Angolan state founded an oil and gas sub-sector direct SOE for investments, known as Sonangol. This SOE, in co-operation and consultation with the Presidency and MINPET, identify partners to work with in the production of oil and gas in any given concession in the country. It also holds shares in any relevant IFDI project on behalf of the state. In an interview, a Sonangol official made it clear that:

> é most direct investors investing in oil and gas are obliged to work with Sonangol through a consortium agreement, production-sharing agreement, risk-service contract or the incorporation of a company in Angola. However, it is not mandatory for Sonangol to find or work with partners. If Sonangol has the capacity, it can work on certain concessions without any partners (Interview with Sonangol Official, 15 July 2014).

If Sonangol decides to partner with a TNC on a given concession, it makes a request to MINPET to issue a public call for tenders and to do the selection of investors. In cases where the response to a request for tenders is not acceptable or satisfactory, MINPET and Sonangol may directly negotiate with possible direct investors without going to tender. An independent researcher pointed out this loophole in the policy framework, and asserted that ñwhere Sonangol can directly negotiate with investors, it opens the door for corruption and clandestine dealingsò (Interview with an Independent Researcher, 14 July 2014).

Another direct institution facilitating IFDI to the energy sector is the BNA, which specifically administers the foreign exchange regulations enshrined in the *Oil and Gas Foreign Exchange Act* (Act 2/2012 of 13 January 2012), guided by Notice 20/2012 of 12 April 2012. The Act has several provisions, *inter alia*, that all energy sector firms, including Sonangol, should have local bank accounts and pay for goods, services and tax obligations using the local banking system. Moreover, direct investors should submit their projected forex requirements and transactions for the following year at the end of November each year, as well as make periodic predictable payments of dividends and profits. All these measures are aimed at strengthening the financial sector and creating stability on financial markets.

A direct institution for dealing with disputes arising from direct investment into the energy sector is the Ministry of Justice. Although MINPET and Sonangol oversee the production and operations of direct investors on any given concession, disputes may arise, calling for the Ministry of Justice to work collaboratively with the parties concerned to resolve the dispute. A Ministry of Justice official pointed out that:

> é the practice in Angola is to resolve disputes by agreement, and in cases of failure to reach an agreement, parties are allowed to go for arbitration. However, our law guiding arbitration of disputes in the energy sector, in particular oil and gas, states that the arbitral tribunal shall sit in Angola, conduct its affairs in Portuguese, and follow the provisions of Angolan law (Interview with Ministry of Justice Official, 17 July 2014).

The Ministry of Justice together with the Ministry of Commerce are involved in the implementation of the *Companies Law* (Law 1/ 2004 of 13 February 2004), which stipulates that foreign investors wishing to conduct industrial or commercial operations in Angola may establish a branch, a representation office, incorporate a new Angolan company, acquire shares in an existing Angolan company, or enter into a consortium or association agreement with an Angolan company. Under the Companies Act, company registration processes normally take between three to six months, even though corrupt officials can either shorten or lengthen the process. Through Decree No. 123/03 of 23 December 2003, the government established the *Guiche Único de Empresa* or one-stop facility, bringing together representatives of various ministries in a single location under the Ministry of Justice in order to simplify and speed up company registration procedures and processing times. However, the Ministry of Justice does not have authority over other government ministries, and processes remain cumbersome, slow and lengthy. Furthermore, firms also have to register with the courts and other local municipal offices in the area of their business operations.

In the exercise of sovereignty principles, the government has also crafted firm-specific policies. These include the Decree/Law 10/07 of 3 October 2007, defining the legal regime for implementing the Angola LNG Project, as will be explained in depth in Section 5.6 below. Furthermore, the state has also established direct firm-level SOEs for specific projects in the oil and gas sub-sector, amongst others, Sonagas (a subsidiary of Sonangol), dealing with the distribution of LNG and LPG from the Angola LNG Project.

Angola has also participated actively in interactions at the regional and international levels, pursuant to its sovereignty principles, with the resulting benefits of IFDI to its energy sector. Realising that much of the IFDI into the energy sector traditionally came from Western countries, Angola signed BITs with Germany, Italy, and Russia, and has negotiated BITs with Portugal, South Africa, Spain, and the UK (yet to enter into force). Angola signed a Trade and Investment Framework Agreement (TIFA) with the US in May 2009, intended to provide a forum for addressing trade issues and to assist in enhancing trade and investment relations between the two countries. Besides this, a Memorandum of Understanding (MOU) was signed in July 2010, aimed at establishing a bilateral Strategic Partnership Dialogue and committing the parties to increased bilateral partnerships. TIFA and the MOU positively influence exports and investments between

the US and Angola. More importantly, the limited number of BITs that Angola has negotiated and signed includes all the major source countries for IFDI to the countryôs energy sector.

The country interacts with the World Bank and has signed the Convention on the Multilateral Investment Guarantee Agency (MIGA) in 1985. MIGA is an arm of the World Bank that provides political risk-insurance guarantees for private investors. Angola has received some direct investments in the energy sector through MIGA guarantees to TNCs, such as Chevron and ExxonMobil. Besides MIGA, the Overseas Private Investment Corporation (OPIC) has provided investment insurance to projects in Angola since 1984. OPIC insurance has facilitated IFDI to Angola from American firms by guaranteeing cover for projects valued at less than US$50 million, particularly for US firms in the energy sector. The country also benefited through the Africa Gas Initiative, especially the joint UNDP and World Bank Energy Sector Management Assistance Programme that has targeted Angola.

In other international interactions, Angola has recently requested the UNFCCC for environment-related investments to its energy sector under the Kyoto Protocolôs CDM. As such, Angola has submitted to the UNFCCC a project to build the Gove Hydro-Electric Power Plant in the Cunene River, with a total generation capacity of 61.86MW, substituting the coal-powered plants that have, until now, provided power to the Huambo Province. In order to deal with the environment and greenhouse gas emissions, TNCs investing in Angolaôs energy sector are also members of the International Petroleum Industry Environmental Conservation Association (IPIECA), the International Standards Organisation (ISO), the World Business Council on Sustainable Development (WBCSD), the World Resources Institute (WRI), and the World Bank-led Global Gas-Flaring Reduction Partnership (GGFRP) – the latter providing funds for the training of some Angolan personnel.

At continental level, Angola is a member of the African Energy Commission (Afrec), the energy-sector arm of the African Union (AU). Afrec defines policies and strategies, and devise plans for integrated energy development on the continent. It also assists with the co-ordinated mobilisation of investments into the energy sector. As such, Angolaôs energy sector indirectly benefits from the activities of Afrec. Angola is also a member of the African Development Bank (AfDB), hugely benefiting from this relationship. In May 2014, for example, the AfDB approved a US$1 billion loan for the Angola Power Sector Reform Support Programme. This programme has three components: restructuring the energy sector and improving its regulatory environment, fostering

private sector investment in the energy sector, and enhancing transparency and efficiency in public financial management. This loan facilitates the development of new policies and the establishment of new institutions to govern the power sub-sector, as well as drawing some investments into the countryôs energy sector.

Angolaôs power utility companies, ENE and EDEL, are also active members of the Association of Electricity Corporations of Africa (ASEA). ASEAôs purpose is to promote the development and integration of African power systems. It works towards inter-connecting electricity networks on the continent, and it also provides a platform for the exchange of experiences and know-how among African power utilities. At a sub-regional level, the ENE is a non-active member of the Southern Africa Power Pool (SAPP). Nevertheless, its non-active participation in the SAPP has some influence on future investments in the energy sector in Angola and the region, as there are some energy projects, such as the Namibia-Angola Inter-Connector, that will ultimately connect Tanzania and Angola to the SAPP. Already, the Lomaum and Bom-Jesus projects have been advertised to investors, using the SAPP as a platform.

Whilst these international relations are important for IFDI to the energy sector in Angola, the harnessing and domestication of regional and international regimes has not been effectively implemented. There are two reasons for this. First, after the civil war ended, the country remained focused on its internal affairs, because of its troubled history. In an interview, a Ministry of Commerce official pointed out that:

> In the past, Angola has suffered as a result of competing international and regional political forces. Some wars were fought in Angola for pure geo-political and cold war reasons, whilst others were for the control of our abundant resources. Now we think the best approach is not to follow what those nations did to us in the past by interfering here and there. Our policy is to focus on our interests and the interests of our people. Regional issues and international issues can be solved at that level, but as a government no one else will deal with our national issues besides ourselves (Interview with Ministry of Commerce Official, 15 July 2014).

Second, there is lack of national capacity in the domestic institutions that should be responsible for harnessing and domesticating regional and international instruments. As a Ministry of Environment official commented:

> é all international instruments have to go to the National Assembly and be debated and approved for them to take effect in Angola. That procedure is clear. The capacity to analyse

> international instruments and how they relate to our existing laws and institutions is lacking. Therefore, we sometimes fail to benefit from international instruments that may benefit us, especially in the area of environmental projects (Interview with Ministry of Environment Official, 17 July 2014).

Though Angola could benefit more by interacting with international regimes and actors, there are certain political factors embedded in the countryôs history, as well as capacity constraints, impeding the process of taking full advantage of such benefits. Hence, the explicit domestication and harnessing of international energy regimes, so that they are harmonised with national policies, is still a problematic issue. However, the country has interacted positively with the World Intellectual Property Organisation (WIPO), and has adopted the Paris Convention for the Protection of Intellectual Property. Thus, Angola has shown a clear commitment to the protection of IPR by subscribing to international norms and standards.

### 5.3.2 Implicit Policies and Indirect Institutions for IFDI to the Energy Sector

There are a few state-enacted implicit policies and indirect institutions that have an effect on IFDI to the energy sector in Angola, mainly found in the area of environmental management and protection, the majority of which do not directly fall under the scope of MINPET or the Ministry of Energy and Water (MINEA). These laws include the *General Environmental Law* (Law No. 05/98 of 19 June 1998), defining the basic concepts and principles for the protection, preservation and conservation of the environment; Decree No. 51/04 of 23 July 2004 on the Environmental Impact Assessment (EIA), establishing the rules and procedures for such assessments; Decree No. 59/07 of 13 July 2007 on Environmental Licensing (the ELD), regulating the licensing of activities that may have a significant social and environmental impact; and Decree No. 1/10 of 13 January 2010 on Environmental Audits, establishing the terms under which environmental audits should take place.

Other recently promulgated laws and regulations include Executive Decree No. 130/09 on Environmental Licensing Fees (26 November 2009), Executive Decree No. 92/12 on the Terms of Reference for Environmental Impact Studies (1 March 2012), Presidential Decree No. 194/11 on the Liability for Environmental Damage (7 July 2011), Presidential Decree No. 261/11 on Water Quality (6 October 2011), Executive Decree No. 87/12 on Public Consultation for Projects subject to EIAs (24 February 2012), Presidential Decree No. 141/12 on the Prevention and

Pollution Control of National Waters (21 June 2012), Presidential Decree No. 190/12 (of 2012) on Waste Management Planning, and Executive Decree No. 97/14 (of 2014) on Operational Discharges Management. These laws fall under the Ministry of Environment, but indirectly affect the energy sector and IFDI as they make environmental impact assessments (EIAs) mandatory prior to the implementation of any project. Furthermore, the Ministry of Environment must approve all EIAs before projects can be licensed.

International regimes that Angola interacts with in the exercise of its sovereignty principles that have no direct effect on IFDI to the energy sector, include the SADC Free Trade Protocol, which harmonises trade and customs regimes and reduces tariffs among SADC countries. In terms of investments, Angola ratified the Protocol on Finance and Investment (FIP) on 1 August 2007, and activities relating to this are nationally co-ordinated by the *Ministério das Finanças*, in particular its Department of International Relations. The country is represented in most of the FIP sub-committees, including the Tax Sub-Committee, where it serves on the tax agreements and indirect taxes working groups, and the Investment Sub-Committee, where it is represented by the Ministry of Finance, the BNA and ANIP. However, Angola is not represented on the Committee of SADC Stock Exchanges, and in the Development Finance Institutions Network. Despite Angolaôs ratification of the SADC FIP and its participation in various sub-committees, there are no direct discernible effects of the FIP on IFDI to Angola from SADC countries, as not many of them have invested in the country. Therefore, further studies on whether the FIP assists in attracting IFDI into Angola are necessary.

Similarly, as an oil-producing country, Angola is a member of the Organisation of Petroleum Exporting Countries (OPEC) since 2007. Earlier, in 2001, Angola signed the OPEC Fund Model Agreement, aimed at unlocking development aid to the country from OPEC – but, again, this did not have any discernible effect on IFDI. Furthermore, in terms of international regimes on the settlement of commercial disputes through arbitration, Angola is not a member of the ICSID and has not ratified the New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards. However, the countryôs *Arbitration Law* is strongly influenced by the UNCITRAL model law, which indirectly affects the energy sector.

## 5.4 GOVERNMENT-IMPOSED DISTORTIONS IN THE ENERGY SECTOR

### 5.4.1 Legal Barriers to Investments in the Energy Sector

Government-imposed distortions in the energy sector in Angola are prevalent in the form of incentives and legal interventions, erecting barriers to the proper functioning of markets. These barriers are primarily protectionist measures, such as the legal requirement that make the participation of SOEs in all investments in oil and gas, as well as in the power sub-sector, mandatory. Through these barriers, no direct investment can be made in Angolaôs energy sector without the state being a shareholder and Sonangol being a partner. Therefore, energy sector policies allow a limited number of actors that have to work with the state.

Other forms of government-imposed distortions are in the form of local content laws, taking effect as soon as a direct investor is granted a prospecting or production licence. Although these local content laws are aimed at promoting the employment of local staff, the ownership of businesses in the oil and gas industry by Angolans, as well as building capacity among domestic companies to act as suppliers of goods and services, they also distort the operation of market forces with regard to price determination and labour. The various government-imposed distortions in the form of laws and policies that provide for local content requirements are shown in Table 3.

**Table 3: Angola's Local Content Laws and Policies in the Oil and Gas Sub-Sector**

| No | Law | Provisions for Local Content |
|---|---|---|
| 1 | Oil Activities Law (Law 10/04) | Investors must give preference to local suppliers, even if up to 10% more expensive; provides for lower taxes for local oil companies. |
| 2 | Oil Taxation Law (Law 13/04) | Investors may get some rebates on certain training and social expenses incurred. |
| 3 | Oil Customs Law (Law 11/04) | Equipment for training purposes is exempt from import duties and tariff protection of the domestic market. |

| | | |
|---|---|---|
| 4 | Law for the Promotion of Business for Local Private Companies (Law 14/03) | Local companies should be given preference for concessions. |
| 5 | Mandatory Hiring and Training of Angolan Citizens (Decree 20/82, and Law 17/09) | Direct investors should have a minimum of 70% Angolan nationals in the firm; work visa applications are regulated and approved for a certain time period. |
| 6 | Fund for Training and Development of Human Resources (Decree 14/10) | Training tax of 0.5% is levied on firms; the companyôs efforts are deductible. |
| 7 | Contracting Services from Local Companies in the Oil Industry (Decrees 127/03, and 48/06) | Three competition regimes: some activities exclusive to Angolan companies or joint ventures. |
| 8 | Exchange Regime for Petroleum Sector (Law 02/12) | Use of the local banking system for making all payments. |

*Source*: Author 2014

Among these local content laws, the most controversial from the point of view of foreign investors is the policy of Angolanisation, enshrined in Presidential Decrees 5/95 and 6/01, aimed at promoting the development of domestic companies and entrepreneurs through the preferential treatment of Angolan companies in public tender processes. It compels foreign firms operating in Angola to maintain a workforce ratio of 30% foreign workers to 70% Angolan employees, as well as TNCs to invest in the training of Angolan workers. It also obliges oil and gas TNCs to source certain products and services exclusively from Angolan companies, especially services that do not require a huge amount of capital and know-how. Moreover, it requires TNCs to supply products and provide services to direct investors in Angola in association or partnership with an Angolan company, and only in exceptional cases use fully foreign-owned companies.

Another distortion that affects investment entry is a policy that links IFDI to the energy sector with the construction of social infrastructure. The contracts that direct investors in the oil industry enter into with government spell out the commitments TNCs have to make to invest in

infrastructure and social services for the benefit of local communities. Energy sector-based TNCs may make commitments to build schools, equip hospitals, or fund micro-credit programmes. These social commitments are generally made in order for a TNC to be granted a concession. ExxonMobil (Esso), for example, has been involved with the Diocese of Luena in the construction of a girlsô boarding school at the Roman Catholic Mission in Cazombo in Moxico Province, catering for girls from local and other more distant communities. However, the policy also encourages downstream investments in facilities such as refineries, as exemplified by the Angola LNG plant and the oil refinery in Lobito.

The levy of taxes by government can also act as a distortion in the market and a barrier to investment. In October 2013, for example, Angola imposed a consumption tax on petroleum companies through Executive Decree No. 333/13, introducing a new set of rules applicable to the assessment and payment of such taxes. This policy requires service providers to include a consumption tax of 5% when issuing invoices for services and supplies provided to oil companies, and another 5% for equipment and rentals. Oil companies should then withhold the amount of consumption tax due when paying for services. Hence, TNCs have the responsibility for paying such taxes over to the relevant tax office, and non-compliance with this policy makes consumption tax borne by oil companies a non-recoverable cost for the purposes of petroleum income tax. In essence, this tax policy raises the costs of doing business for TNCs, especially those in oil and gas exploration.

### 5.4.2 Energy Sector Incentives for IFDI

There are government-imposed distortions in the form of incentives that are granted by the government of Angola to promote and facilitate IFDI to the energy sector. However, the conferring of these incentives is quite complex as they are found in a number of policies and are administered by different institutions. Explicit incentive policy frameworks in the energy sector implemented by MINPET are the *Oil Taxation Law* (Law 13/04), awarding some rebates to TNCs on certain training and social expenses incurred, the *Oil Customs Law* (Law 11/04), exempting equipment imported for training purposes from import duties and providing tariff protection for companies operating in the domestic market, and the *Fund for Training and Development of Human Resources* (Decree 14/10), deducting company costs incurred on the training of local staff.

Government-imposed distortions in the form of incentives that affect energy sector-based TNCs are also enshrined in the *Private Investment Law* (Law No. 20/11 of 20 May 2011), and these are administered by the Angolan National Private Investment Agency (ANIP). This piece of legislation offers investors several incentives in a wide range of industries, *inter alia*, firms in the energy sector, provided that certain conditions are met. Incentives made available in terms of this law are time-bound tax incentives, or tax reductions that are applicable on a case-by-case basis and on the merits of each investment.

ANIP uses the following criteria in determining tax and duties incentives, or reductions for a given investment: type and value of the investment, its contribution towards the realisation of Angolaôs economic development strategy, views on ñdirect and indirect capital gains, complexity of [the] investment, estimated time required for a return on capital, type of technology to be utilised, commitment to reinvestment of profits, volume of goods or services to be produced, and [the] creation of production linesò (ANIP 2014). Using these criteria, ANIP may offer an extraordinary tax incentive for investments perceived as highly relevant for the countryôs strategic development, creating at least 500 jobs, contributing to a major boost in technological innovation and scientific research, and with exports that could exceed US$50 million and inputs valued at above US$50 million. Actual incentives available include, import rights, deferral of tax payments, accelerated amortisation and depreciation, tax payment deductions, exemptions, reductions, and credits. As most of the projects in the energy sector have been greenfield investments worth more than US$50 million and with a capacity to create at least 500 jobs, they have been offered a variety of incentives. Also, in the cases of the Biocom, Angola LNG and Hydro Chikapa 1 projects, local content laws and Angolanisation policies have been waived in order to promote investments in these areas.

## 5.5. POLICY AND INSTITUTIONAL SYNERGIES AND CO-ORDINATION

The co-ordination of direct investment activities in the energy sector is the preserve of MINPET, Sonangol and ANIP. However, synergies across ministries, such as MINPET and the Ministry of Environment, are built at the highest level of government ï thus, through the Presidency. Moreover, the Presidency has created two other institutions that assist in building synergies and co-ordinating energy-sector direct investment, namely the Council of Ministers and an *ad hoc* Cabinet Committee, responsible for determining which projects qualify as direct investments in the energy sector. The Council and the *ad hoc* Committee assists the Presidency in decision-

making during the processing of qualifying investments, as well as ensuring that the various ministries are represented before decisions on investments are taken. Thus, ANIP, the Council of Ministers, the Presidency, MINPET, Sonangol, as well as the *ad hoc* Cabinet Committee, are all involved in the co-ordination and the building of synergies for IFDI to the energy sector.

Another institution that facilitates co-ordination of direct investments in the energy sector is the *Guiche Único de Empresa*, a one-stop facility that brings together representatives of various ministries in one location under the Ministry of Justice in order to simplify and expedite company registration time. Similarly, the National Assembly of Angola acts as an arbiter, facilitating the harmonisation of international regimes with local legislation and policies. Angola has also created a Designated National Authority (DNA), enabling it to interact with the UNFCCC, especially its CDM.

Having analysed these mechanisms for synergy-building and co-ordination, the focus now shifts to the transfer of technologies and ESTs in the energy sector through the vehicle of IFDI.

## 5.6. ENERGY SECTOR IFDI AND THE TRANSFER OF ESTs

### 5.6.1 Energy Sector IFDI and the Transfer ESTs: A Sector-Level Analysis

From the outset it is worth pointing out that the sovereign state of Angola intentionally directs IFDI to the energy sector, in the process facilitating the transfer of technologies in the form of machinery and hardware. In this regard, IFDI into oil and gas in Angola has primarily brought in such equipment, enabling the exploitation of these strategic resources, delivering oil and gas (through pipelines) to local refineries, constructing and developing domestic refineries, expanding local refineries, and exporting oil and gas to regional and international markets. Thus, machinery and hardware cut across the whole oil and gas value chain, and the appropriate technologies are supplied by original equipment manufacturers (OEMs) with subsidiaries located inside Angola. Hence, most of the machinery and hardware used in the oil and gas industries came into the country mainly through IFDI activities and through licencing and import agreements.

Furthermore, the transfer of hardware and machinery in the oil and gas sub-sector through IFDI is mainly direct, internal, and commercial. It is normal for project owners, including Sonangol,

to discuss technology transfers with technology proprietors without the participation of intermediaries. Machinery and hardware brought into Angolaôs oil and gas industries is internalised when TNCs from developed countries make direct transfers of specific equipment through their subsidiaries inside Angola. Limited external transfer of technologies occurs through the rental of equipment from some OEM subsidiaries located inside Angola during the project construction and development phases. Finally, the transfer of machinery and hardware to the oil and gas industries through IFDI is of a commercial nature when project owners pay for the acquisition of such equipment.

IFDI to Angolaôs energy sector has also been a catalyst for the transfer of machinery and hardware into the power sub-sector, especially in electricity generation and distribution. Equipment and components have been transferred through FDI inflows to bio-energy projects, such as the Biocom project. A Sonangol official commented that ñthe success of the Biocom project is due to the transfer of machinery and hardware. In fact, all components for the project came from Brazil, which is a leading country in this technologyò (Interview with Sonangol Official, 15 July 2014).

The reason why the international transfer of hardware and machinery through FDI inflows to the oil and gas industries, and the power sub-sector, occurs is because Angola lacks local or domestic capabilities to manufacture such equipment. As a MINPET official stated:

> é we, like many developing countries, are still importing or buying basic things, because we do not have the industry to manufacture products locally. We buy and import electric bulbs at the moment; think of a time when we will be able to manufacture components for a power plant or an oil-rig (Interview with MINPET Official, 14 July 2014).

Hence, the lack of technology-manufacturing capacities and capabilities has made the countryôs energy sector largely dependent on the international transfer of machinery and hardware through many channels, including IFDI.

Whereas the transfer of machinery and hardware through IFDI to oil and gas, as well as bio-energy, can without any difficulty be demonstrated empirically, the transfer of technology in the energy sector in the form of designs or blueprints is not so easily noticeable. A MINEA official pointed out that ñthere is no project that we have been given all the designs by the developers.

Design-transfer is possible in an academic sense, but in practice it means the developer can go out of businessò (Interview with MINEA Official, 14 July 2014).

The transfer of technology through knowledge in the form of know-how is a quite recent phenomenon occurring through new forms of FDI inflows to renewables. Investments into renewables have not reached a stage where large-scale machinery and hardware are needed, as most projects are still in a feasibility or exploratory phase. For example, much work on huge wind and solar-energy projects is still in the mapping and planning phases. In this case, knowledge transfer is taking place through international firms transferring skills on project design to the few Angolan technicians and engineers engaged during exploration and feasibility studies. However, once this stage is completed, ñwe would expect IFDI to concentrate on the transfer of hardware and machinery required for production – and these transferred capacities can sometimes become redundantò (Interview with MINEA Official, 14 July 2014).

There is some evidence of technology or knowledge transfer through training aimed at creating supply-chain linkages, especially in the oil and gas industries. Angolaôs local content laws have promoted training institutions and programmes for capacity-building in local firms so as to empower them to become suppliers to TNCs. Current training programmes focus on financials, business management, and the bidding process for open tenders. Several locally-owned Angolan firms have participated in these training schemes, subsequently establishing supply links with TNCs, especially in the oil and gas sub-sector. These capacity-building training schemes have mainly been offered by international NGOs, with financial support from TNCs. Hence, there is some transfer of technology in the form of knowledge transfer. However, knowledge being transferred is not in manufacturing, but in general services that are not directly related to oil and gas exploration, production, or distribution. Also, in general, the transfer of managerial capacities through IFDI to the energy sector in Angola has been quite limited. Foreign firms have not fully complied with the Angolanisation policy and local content requirements and managerial positions have remained in the hands of foreigners or expatriate staff.

It is premature to try and provide evidence of IFDI to power-generation through hydro-power schemes. Whilst there have been huge state investments into hydro-power, the current situation allows for rather limited participation of independent power producers, and only limited ownership of power plants by non-state entities. Therefore, SOEs contract service providers who are responsible for some services, but who do not necessarily have any equity shares that

establish at least a 10% ownership in projects. Hence, most of the hydro-power generation projects do not meet the definitional requirements for FDI. A qualifying, completed IFDI hydro-power generating and distribution scheme is the Hydro Chikapa 1 scheme in the Lunda Sul Province, explained in more detail in Box 2.

**Box 2: IFDI into Hydro-Power in Angola -- Hydro Chikapa 1**

Hydro Chikapa 1 involved IFDI by the Alrosa group of Russia, which owns a 55% equity share in the power-generating company, Hydrochicapa SARL; the remaining 45% equity is held by ENE. It was designed by Alrosaôs Yakutniproalmaz Institute, and constructed by Alrosa-Vneshstroy Ltd. The equipment and workers for the project primarily came from Russia. The main purpose of the 16MW project was to generate power to supply Alrosaôs mining activities, but it has since started supplying 4MW of power to the town of Saurimo.

The transfer of technologies through TNCs establishing R&D centres inside Angola is non-existent at the moment. Most TNCs have kept R&D and innovation activities located at the parent company, or in the home country. Thus, IFDI to the energy sector in Angola has not prompted local R&D activities by subsidiaries of TNCs, or the transfer of R&D activities from TNC-home countries to Angola.

Besides the transfer of technologies in general, an analysis of the transfer of ESTs through IFDI at sector level shows that the greatest proportion of technologies that are transferred into the energy sector in Angola are primarily hardware or machinery that go into the oil and gas industries, instead of renewables or alternative energy sources. This means that a lot of IFDI is invested in industries that are not that environmentally friendly. Oil-spills and rampant gas-flaring or venting during production demonstrate that the transfer of ESTs into the oil sub-sector is minimal. However, despite the environmentally unfriendly nature of technology transfer into oil, the country has made a major investment that reduces gas-flaring or venting, especially through the Angola LNG project. As a project arising from IFDI and the international transfer of technologies, the Angola LNG project is much cleaner than direct investments into crude oil. Therefore, the technologies transferred in the Angola LNG project may be viewed as ESTs.

Essentially, the transfer of ESTs is the transfer of environmentally friendly practices. Though TNCs in Angolaôs oil and gas sub-sectors deal with issues that relate to the environment through,

inter alia, conducting EIAs, developing environment-management systems, and moving towards international standards certification, for the most part these processes take place internally between the various headquarters and their subsidiary firms inside Angola. In most cases, local firms are not actively involved in providing these services. Hence, the transfer of tacit information or knowledge in these areas is limited. Furthermore, few subsidiaries of TNCs in Angolaôs oil and gas industries have obtained ISO 4001-certification which pertains to the environment, and are basically limited to companies such as BP and Total. As such, the practices of many TNCs with regard to the environment can be considered as not benchmarked against international ôbest practicesô and standards. Therefore, from the vantage point of the transfer of ESTs through environmentally friendly practices, IFDI has not been a good vehicle for transfer, especially in the oil and gas sub-sectors.

However, the new FDI inflows to renewables such as bio-energy, wind and solar power have potential for the transfer ESTs, but the transfer of technologies in these areas is currently still at fairly embryonic stages. For example, technology transfer relevant to wind energy is still confined to blueprints –that is, tacit information on the design of wind projects. There is no local capacity to design wind-energy systems and to manufacture hardware or components that will ensure the generation and distribution of electricity from wind power. In the same vein, the transfer of technology relating to solar energy is mainly concerned with the installation of photovoltaic cells and off-grid, small systems that serve rural public facilities. There is no local capacity to manufacture photovoltaic components and develop off or on-grid solar systems in the country. Thus, Angola still largely depends on the transfer of these technologies by TNCs and foreign expatriates.

In terms of technology transfer into bio-energy projects, the Biocom project is a clear demonstration of the transfer of ESTs into this sub-sector. However, it should be cautioned that, whilst the end-use machinery and hardware constituting the plant for the production of sugar, ethanol and electricity is environmentally friendly and procured from Brazil, the agricultural processes associated with sugarcane production are environmentally degrading. Thus, whilst the end-use plant clearly establishes the transfer of ESTs into Angola, if the whole value chain of the investment is holistically considered the result becomes rather mixed and complex to assess.

In Angolaôs energy sector, IFDI has primarily gone into greenfield investments, meaning direct investments have brought new and less-polluting machinery and hardware into the country. This

technology can be looked upon favourably in terms of environmental friendliness and anti-pollution qualities, especially as it is not old and antiquated machinery as would be the case with brownfield investments. Therefore, since the bulk of IFDI to the energy sector in Angola is invested in greenfield projects, the technologies transferred are environmentally friendly, compared to a situation where the same technologies are going into old and out-dated plants.

Since the successful transfer of technologies occur when technologies are assimilated and appropriated by local firms, an examination of the linkages between domestic firms and TNCs in the energy sector in Angola shows that, whereas transnational corporations operating in the oil and gas industries have traditionally been considered functioning in an enclave with little direct linkages to domestic firms and the wider economy, this is no longer the case after the introduction of local content laws, which have created incentives for TNCs to interact with domestic firms through supply-chain linkages. Thus, some domestic Angolan firms supply services to oil and gas TNCs. However, not many firms are involved as suppliers, since TNCs usually streamline the numbers of suppliers and prefer to use a single firm to conduct a variety of services, benefiting them in terms of administration, making service-payments, and supervising work done.

The services that contracted domestic firms provide to TNCs in the energy sector in Angola are not directly related to manufacturing, engineering, or core business. Most supply-chain linkages are created in the supply of secondary inputs to the core value chain of the energy sector, and domestic firms therefore provide cleaning services, supply food and beverages, industrial clothing and footwear, and printing and design services. Domestic firms do not succeed in penetrating and providing core services to TNCs, purely because contractual agreements between project owners, EPCMs and OEMs state that repairs and maintenance of plants and original equipment remain their preserve, which exclude the participation of local industries in supplying direct production-related services. However, a few domestic firms that have managed to secure direct production-related services are those providing welding, metal fabrication, and electrical-installation services under close supervision of OEMs or EPCMs.

Whilst there are some supply-chain linkages between domestic firms and TNCs in Angolaôs energy sector, a close analysis of these linkages shows that domestic firms lack the manufacturing capabilities to provide direct services to the core business of TNCs. Hence, the necessity to build manufacturing capabilities and capacities among domestic firms, requiring

closer interaction between local content laws and industrial policies, as well as closer interaction between the institutions that develop and manage these policies, in particular MINPET, Sonangol, and the Ministry of Industry.

Linkages between TNCs and domestic firms based on distribution chains are very limited, because of the monopolistic control of the supply chain by state-owned Sonangol, which has created several subsidiary companies to facilitate distribution of oil and gas products in Angola. Similarly, in the power sub-sector, ENE, EDEL and GAMEK are monopolistic entities that control the supply of electricity, and therefore limit value chains that could have been created from distribution.

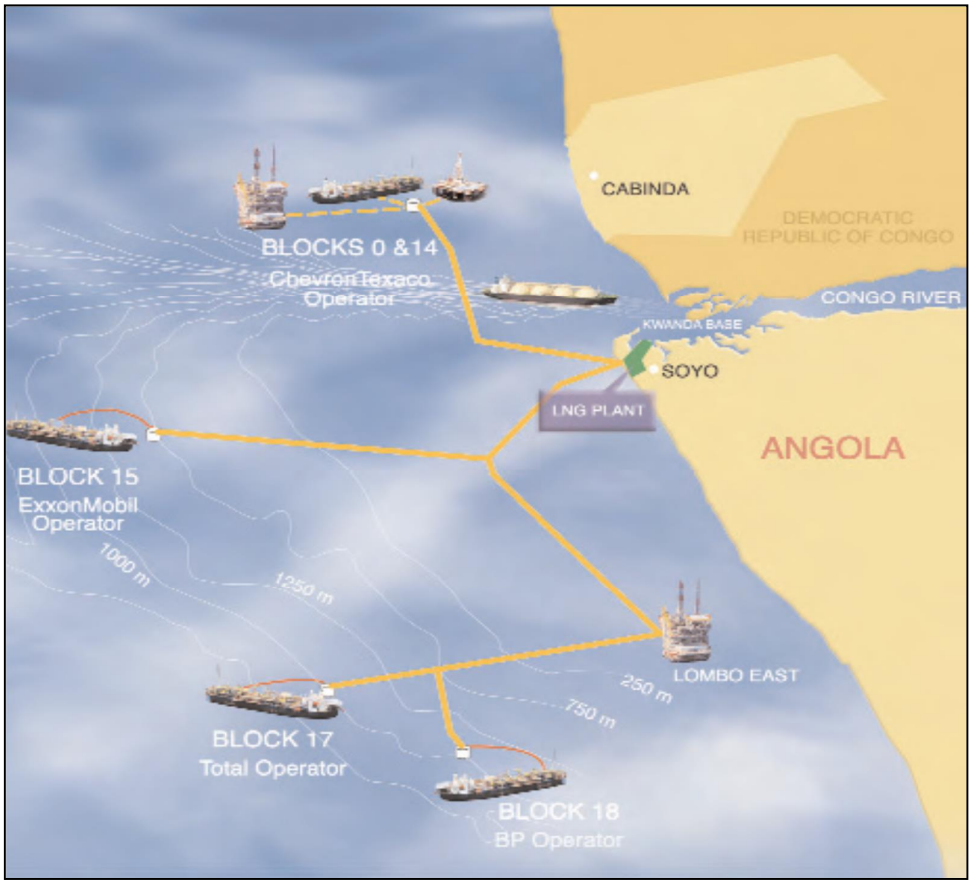
### 5.6.2 Energy Sector IFDI and the Transfer of ESTs: A Firm-Level Analysis

In order to demonstrate energy-sector IFDI and the transfer of ESTs, an instructive firm-level case study is the Angola LNG Project. As a background to the project: in the 1990s, Angola realised that the countryôs abundant gas resources were lost through flaring, or simply left unexploited. Therefore, the government asked firms operating in the oil and gas industries to provide solutions that would ensure that associated gas, as well as non-associated gas, would be profitably exploited. After the presentation of several solutions, the Angola LNG Project was selected as the most appropriate solution. After this determination, Chevron and Sonangol conducted a feasibility study that confirmed the viability of the project. Following the feasibility study, Sonangol and Chevron extended an invitation to other operators in the oil and gas industry to participate in the project. Hence, several TNCs became joint partners through a Participation Sharing Agreement signed in March 2002, in terms of which Chevron and Sonangol hold 36.4% and 22.8% equity shares, respectively, whilst Total, BP and Eni were allocated 13.6% equity shares each. Thus, Chevron and Sonangol are the project core leaders, but as all the other TNCs have more than a 10% equity share, their investments in the project qualifies as FDI. Sonangolôs involvement represents the Angolan interest in the project.

The Angola LNG Project is located off the Cabinda Enclave and off Soyo in the Zaire Province. The project involves five offshore oil fields: Blocks 0 and 14, located north of Congo River mouth (opposite Cabinda), and Blocks 15, 17 and 18, located south of the Congo River estuary. In its totality, the project consists of a central LNG processing plant, with associated gas-dense-phase pipelines, transporting associated gas from Blocks 0 and 14; an associated gas-dense-phase

pipeline, carrying associated gas from deep-water Block 15; and an associated gas-dense-phase pipeline, conveying associated gas from deep-water Blocks 17 and 18, as shown in Figure 9. The project is composed of an onshore gas-processing and liquefaction plant at Soyo, an offshore gathering system of high-pressure offshore pipelines, and a distribution system that caters for the delivery of products to domestic and international markets.

**Figure 9: The Angola LNG Project**




Source: Angola LNG Project 2014

In order for the Angola LNG Project to be realised, the government of Angola created certain policy frameworks and institutional structures in support of this IFDI venture. Direct institutions involved with the project at national level include the Presidency, supported by the Council of Ministers, an *ad hoc* Cabinet Committee, the Ministry of Economy, the Ministry of Finance, the BNA, the Ministry of Justice, and ANIP. These institutions perform an overall oversight function on several facets of the project. Indirect national institutions involved with the project include

the Ministry of Environment, the Ministry of Commerce, MINEA, the Ministry of Planning, and the Ministry of Interior.

At sector-level, MINPET and the SOE, Sonangol, are the main direct institutions involved with the Angola LNG Project – like many such projects in the oil and gas industries. The government has introduced a number of explicit policies at various levels to govern projects in the oil and gas industries. The explicit national and sector-specific legislation that have an effect on the Angola LNG Project include the *Petroleum Act* (Act 10/04), the *Taxation of Petroleum Activities Act* (Act 13/04), the *Special Foreign Exchange Regime for the Oil Industry* (Act 2/12), and the *Oil Industry Customs Framework* (Act 11/04).

The state also enacted some explicit project-specific legal frameworks that fall under MINPET, ensuring the commencement and operationalisation of the Angola LNG Project. In order to launch the project and in the spirit of the Constitution of Angola, Resolution 17/01 of 3 October 2001 was passed, stating that the production and commercialisation of natural gas was of public interest and, therefore, needed to be put under state control. This was followed by Decree No. 76/07 of 24 October 2007, transferring the land needed for construction from state ownership to the private ownership of investing firms, and Decree No. 77/07 of 7 November 2007, separating the project from the control and official supervision of the port authorities of Soyo and creating an independent port entity.

In addition, the state went further to enact firm-specific legal statutes and policies, facilitating the actual implementation and execution of the project, including Decree/Law No. 10/07 of 3 October 2007, approving the general Angola LNG project framework and determining the project implementation parameters, creating a new regime and clarifying issues around the liquefaction of gas (as these matters were not provided for under other existing instruments governing petroleum), and formulating the incentives associated with implementation of the project.

In terms of this decree/law, government-imposed distortions in the form of incentives for the Angola LNG project were determined in consultation with the Ministry of Economy and ANIP. Incentives offered included an industrial tax exemption, a reduced petroleum income tax rate, exemption from the responsibility to withhold tax from all service providers involved in project construction, design and development, and customs duties exemption on the list of materials used

in plant and pipelines construction. Labour rules were modified to include more working hours per day, per week, per month, and per annum; hence, creating an intensely concentrated work schedule for employees. The policy of Angolanisation was adjusted to allow for more expatriates, since Angola lacked the necessary skilled labour for the project. In addition, local content laws were relaxed to allow for procurement of project materials outside Angola, and to reduce bureaucracy in procurement processes. The government also provided further inducements through creating special foreign exchange policies for the project in terms of the same decree/law. These policies were aimed at facilitating payments to offshore and international service providers, OEMs and shareholders, as well as distributing profits without delay, naturally under the supervision of the Ministry of Finance, the BNA, and Sonangol.

In order to complete the plant and associated pipelines construction process, the state enacted a number of legal decrees, *inter alia*, Executive Decrees 188/08, 189/08, 193/08, 200/08 and 203/08, regulating the technical design, construction and operation of gas pipelines, Executive Decree 187/08, specifying gas-volume metering rules, Executive Decree 224/12, regulating the management of gas operations, and Executive Decree 38/09, stipulating safety rules for oil and gas operations. In order to provide for the transportation and storage of gas, the *Oil and Gas Transportation and Storage Act* (Act 26/12) was promulgated in 2012, arranging for gas export licences to be issued by the Ministry of Commerce.

The state utilised explicit and implicit policies relating to the protection of the environment during the construction and operationalisation of the project. The overarching Angolan law that deals with environmental matters is the *General Environment Law* of 1998, requiring that major activities in the country should be subject to environmental impact assessments (EIAs) and determining general requirements for such assessments. This law is administered by the Ministry of Environment. The state also crafted an explicit law applicable to the Angola LNG Project, namely Decree 39/00 on the *Environmental Protection for the Petroleum Industry*. This decree is administered by MINPET and lays down specific EIA requirements for the petroleum industry. In addition, the Council of Ministers promulgated Decree 51/04 on *Environmental Impact Assessment*, stipulating the content and structure of an EIA, including consultation, the approval of procedures, timeframes, the role of regulators, and the issuing of permits.

Thus, the Angola LNG Project is governed by both implicit and explicit policies and legal statutes, as well as direct and indirect institutions that are national, sector-specific, and firm

specific. Explicit policies and legal statutes have evolved in tandem with the project. An adaptable management approach to policy formulation was taken, involving a practical learning process, an interactive process between policy and practice (helping to create more specific policies and laws), as well as policy wording offering more clarity on the project. In this regard, these laws and policies should be viewed as still evolving and the process of policy-making for the Angola LNG Project as incomplete.

Direct national and sector institutions involved in the Angola LNG Project are all supervised and co-ordinated at the apex by the Presidency, with the support of the Council of Ministers, the *ad hoc* Cabinet Committee, and ANIP. The Council of Ministers acts as a forum for co-ordinating the inputs of the different ministries. The BNA plays an important role in foreign exchange matters and other similar matters relating to IFDI projects. Sonangol is also central as it is the government institution involved in project management and operational matters.

In advancing the project, the state interacts with international regimes, specifically those concerned with gas-flaring. However, there are no discernible continental or sub-regional (SADC) policies on gas that may have an effect on the Angola LNG Project. At international level, Angola is a member to the World Bankôs Global Gas-Flaring Reduction Partnership (GGFRP) and its interactions with this institution were important in designing the Angola LNG Project. In addition, in October 2005, October 2006 and, again, in February 2007, the GGFRP funded several conferences and presentations to raise awareness on the Angola LNG Project.

As a country eligible for support from the World Bank, the Angola LNG Project voluntarily makes use of the World Bank and the International Finance Corporationôs policies and guidelines in conducting EIAs. As explained by an Angola LNG Project official, assimilating these ñinternational environmental guidelines on EIAs helped to enhance the projectôs appeal to international stakeholdersò (Interview with Angola LNG Official, 21 July 2014). A comprehensive list of international regimes that guided the EIA process is provided in Appendix I. As shown in the list, among these policies are some that directly and explicitly impacted the Angola LNG Project, whilst others had a rather indirect influence.

In other interactions with international regimes, Angola is a party to the UNFCCC of 1992, and ratified the Kyoto Protocol of 1997 in May 2007. As a party to these agreements, Angola has explored ways to secure carbon credits from the CDM. In this regard, two key studies were

conducted in 2006 and 2007, assessing the eligibility of the Angola LNG Project for carbon credits. On 14 December 2007, Sonagas presented the project during the proceedings of COP13 in Bali, Indonesia. On 26 November 2008, the *Banco Espirito Santo Angola* confirmed its interest in buying carbon credits (resulting from the project) through a letter of intention. Then, things started to fall into place quickly. In 2010 Angola established a DNA through Decree No. 2/10 in order to adhere to the CDM requirements, on 21 October 2010 the preparation of project documents for submission to the CDM commenced, and by 31 August 2011 all supporting documents were lodged with the CDM. The validation process of the CDM commenced on 10 November 2011 with the publication of the Angola LNG Project details on the UNFCCC website.

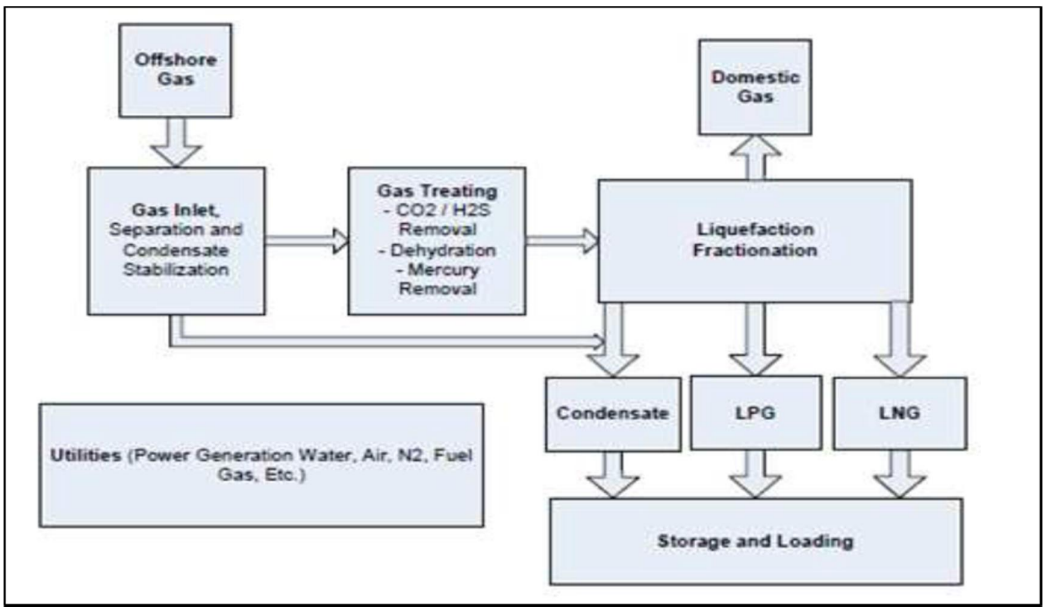
Angola also interacted with international actors through BITs, especially with countries that have firms involved in IFDI for the Angola LNG Project. For example, Angola has a BIT (in force) with Italy, signed in 2002, protecting the direct investment of an Italian firm, Eni, in the project. Similarly, Angola has a signed BIT (not in force) with the UK, home to BP. The protection of the Chevron investment in the project is enhanced by the Trade and Investment Framework Agreement between the US and Angola, signed on 19 May 2009. These BITs and the TIFA provide some protection to the investments made by emphasising the modalities for dispute settlement and compensation.

Having highlighted the active involvement of the Angolan state in the affairs of the Angola LNG Project, the question that remains to be answered is: Has the Angola LNG Project transferred technologies, including ESTs? The answer is largely affirmative, because the project is a massive greenfield operation arising from IFDI to Angola, certainly contributing to technology transfer. Like most greenfield energy sector projects in Angola, IFDI through the Angola LNG Project has mainly facilitated the transfer of hardware and machinery (equipment). ñHardware and machinery transferred by the Angola LNG Project was non-existent before the advent of this projectò (Interview with MINEA Official, 14 July 2014). The equipment transferred includes those installed in the plant, and associated with pipelines transporting gas from oil-wells to the plant. Plant construction technology was licensed to Angola LNG by ConocoPhillips, an internationally renowned LNG technology-designing firm, and the construction of the plant was performed by Bechtel, an EPCM company, using the ConocoPhillips optimised cascade (SM) process.

For simplicity and brevity, the technical engineering detail of transferred hardware and machinery is best avoided. However, what can be stated is that the Angola LNG Project is an integrated engineering system, as shown in Figure 10. The system consists of gas-inlet facilities, process units, an acid-gas removal unit, a dehydration unit, mercury removal beds, a liquefaction unit, a LPG/condensate separation or stabilisation unit, a flare and blow-down system, a 25MW electrical power-generation gas-turbine-based unit, and a product storage unit, catering for LNG, LPG, propane, butane, and condensate.

Angola LNG Project is indeed a complex project involving integrated, sophisticated engineering and manufacturing processes. Hence, the technology that was employed in the construction of the system came from abroad and was assembled in Angola. In an interview with MINEA officials on 14 July 2014, they stated that ñthere was no participation of Angolan domestic firms in manufacturing components or parts associated with the plant. The systems-design was also conducted by Bechtel, with very little involvement of local firms.ò Strict internationally-set construction lead-times meant that EPCMs did not have the leeway to create capacity in local companies and ensure that they contribute to project-design or construction. Furthermore, the relaxation of local content laws meant that EPCM firms were not saddled with any legal burden to meet local content requirements. The relaxation of customs duties on imported materials for construction also made this a cheaper option for EPCMs.

**Figure 10: The Angola LNG Technical Systems Flow Diagram**




*Source*: Angola LNG 2011

The Angola LNG Project has also facilitated the transfer of knowledge to Angola. This is still an on-going process, premised on the training of Angolan personnel for employment. Clearly, knowledge transfer is of crucial importance, since Angola had no previous experience with an LNG plant. The country also had very few local workers with the necessary experience and skills for employment in this kind of greenfield project. The shortage of skilled labour is demonstrated by the fact that the LNG project employed between 3 000 and 5 000 non-permanent workers during its construction phase. About 48% of the total 50% local workforce was engaged in low-level menial tasks, another 1.5% was employed in a supervisory capacity, and only the remaining 0.5% occupied technical positions. Expatriates, including those from India, Brazil, Europe and North America, constituted the other 50% of non-permanent employees, and they worked mainly as supervisors, technical personnel, and managers, with only a few in menial jobs.

Knowledge transfer involved the training of Angolans in technical and engineering aspects of the project, commencing during the construction phase of the plant. Selected personnel had to undergo three years of training in Angola and abroad, mostly in Europe and the US. The first cohort of 50 Angolans started training in the technical aspects of LNG technology in 2009. A similar number was enrolled in 2010 and 2011. In order to enhance knowledge transfer, Angola also signed a training agreement with India to transfer LNG skills to Angolans through local training, and the exchange of personnel between Angola and India.

The impact of knowledge transfer through training has not been evaluated. So, to accurately state the training effects on the labour and skills-base of the project, and the implications for the Angolanisation policy is rather difficult, if not impossible. However, when the project commenced production in 2013, there were about 500 permanent employees. It is estimated that about 25% of this permanent staff complement were Angolans, and of these 20% were working in lower-level jobs and the balance of 5% in technical and engineering positions. The problem in understanding the effects of knowledge transfer through training is that recruitment to work in managerial positions is highly politicised and, moreover, the Angolanisation policy of 30% expatriates to 70% Angolans is not applicable to this project.

Transfer of technologies through the direct supply chain of manufactured components and parts is still non-existent. However, there is growing supply chain technology transfer in indirect support areas, such as those associated with providing catering services, hospitality, cleaning services, safety clothing, and footwear. Even so, technology transfer in these supply chains needs

greater capacity-building in order to deliver goods on time to Soyo, which is rather isolated and far removed from Luanda. The transfer of technology through distribution chains is also non-existent. Plans for establishing R&D facilities inside Angola, focusing on LNG technologies, have still not materialised – thus, there is no technology transfer through the localisation of R&D activities.

Has the Angola LNG Project transferred ESTs? IFDI to the Angola LNG Project by Chevron, Eni and BP can be considered as the transfer of cleaner technologies and ESTs. Before the launching of this LNG project, gas generated during oil extraction was flared or vented at the oil fields. Gas-flaring wasted valuable resources, besides causing harm to the environment. The Angola LNG Project reduced the flaring or venting of gas from oil extraction by capturing gas for productive use. Hence, the project reduced greenhouse gas emissions by recovering gas and utilising it in an environmentally friendly manner. However, since the project is still at an embryonic stage, it is not possible to provide a full assessment of its negative impacts on the environment. Besides the transfer of cleaner technologies, the project has not reached a stage where judgements can be made on the transfer of ópollution halosô or environmental óbest practicesô. Thus, this study cannot produce any evidence on the transfer of environmental óbest practicesô based on the Angola LNG Project.

Likewise, whilst the project utilised LNG technologies not available in the country before, the study cannot demonstrate that technology leapfrogging occurred. Evidence could not be found that the technology used in the Angola LNG Project is the best and most modern technology available on the market. However, since the LNG project was temporarily brought to a halt within a few months of installation, after gas leaks were found and the corrosion of pipes by sea water was detected, this may mean that the technology transferred was sub-standard or inappropriate.

At present, the Angola LNG Project is still at an early stage of production. Therefore, there are a few linkages with domestic firms that have been burgeoning and are well-supported, especially supply chain linkages associated with the provision of cleaning, catering, and other non-manufacturing services. However, linkages with domestic firms will remain weak and take time to develop, since local content laws have been relaxed for the project. Moreover, it is absolutely imperative that capacities and capabilities be developed within domestic firms so that they can perform meaningful and direct roles in the project.

## 5.7 CONCLUSION

This chapter has examined a host country, Angola, in relation to IFDI to its energy sector and the transfer of technologies, including ESTs. It has provided general, contextual information on IFDI to the energy sector, particularly oil and gas, power, renewables, alternative sources of energy, and hydro-power. It has analysed the stateôs exercise of sovereignty principles through the crafting of policies and establishing of institutions for IFDI to the energy sector. It has shown that IFDI to the countryôs energy sector is actively regulated by the state through a number of national, sector-specific, and firm-specific explicit policies and direct institutions, and a few implicit laws and indirect institutions. It has highlighted that Angola also engages in international relations, thus networking with international actors and regimes. The chapter has shown that the government impose distortions on markets through incentives, legal barriers, and direct interventions by SOEs. It has underlined that the co-ordination of Angolaôs IFDI policy framework and institutions generally rests with the Presidency, assisted by ANIP, the Council of Ministers, and an *ad hoc* Cabinet Committee.

In relation to the transfer of technologies in the energy sector, including ESTs, this chapter has highlighted the fact that the Biocom Project and the Angola LNG Project, which are both IFDI projects, can be considered innovative projects facilitating the transfer of ESTs, especially through the transfer of cleaner technologies. It has shown that the transfer of technologies in the energy sector through FDI inflows to Angola is mainly related to the transfer of hardware and machinery (equipment), and very little concerned with project-designs or blueprints and managerial practices. It has also emphasised that knowledge transfer through training do take place, but that it is still too early to pass judgement on its impacts. It has demonstrated that domestic firms lack technological capabilities to be able to participate fully in IFDI supply value chains. The transfer of technologies through distribution chains is non-existent as Angolaôs national policies limit any participation in the energy sector to SOEs. It has further pointed out the lack of localised R&D activities and facilities.

Whilst this chapter focused on IFDI-carrying ESTs and Angola as a host country, the following chapter will use South Africa as a case study, examining whether the countryôs OFDI transfers ESTs to other countries.

# CHAPTER 6: SOUTH AFRICA'S ENERGY SECTOR OUTWARD FOREIGN DIRECT INVESTMENT AND THE TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGIES

## 6.1 INTRODUCTION

The previous chapter has examined the transfer of ESTs through the medium of FDI inflows to Angolaôs energy sector. It has shown that Angola exercised sovereignty principles by crafting regulations and establishing agencies for IFDI, and it has demonstrated that the government imposed some distortions on the market in order to facilitate flows of IFDI to the energy sector. In addition, it has also highlighted Angolaôs use of structural power at the domestic level and its engagement in international relations. The chapter also provided sector-level examples, such as the Biocom Project and the Hydro-Chikapa 1 Project as greenfield IFDI projects where technologies where generally transferred, and a firm-level case study of the Angola LNG Project to demonstrate the transfer of ESTs in the energy sector through IFDI.

This chapter will examine South Africa as a home country to OFDI, and the transfer of technologies and ESTs, in particular, to host countries. The key questions that will need to be answered are: What national and international legislation, policies, and institutional mechanisms does South Africa use to govern OFDI in the energy sectors of other African countries? Has South Africaôs OFDI transferred, or is it transferring, ESTs through OFDI to the energy sectors of other African countries? Thus, the chapter will be analysing energy sector OFDI from South Africa to other countries, as well as providing a firm-level case study of Eskom Enterprises Ltdôs OFDI in Uganda through a subsidiary, Eskom Uganda Ltd.

## 6.2 THE CONTEXT OF SOUTH AFRICA'S OFDI AND ENERGY SECTOR OFDI

### 6.2.1 The Scale and Destinations of South Africa's OFDI

South African economic dynamics can be viewed using ódouble optical fociô: the apartheid era, and the post-apartheid, post-1994 era. The end of apartheid in the early 1990s signalled the relaxation of anti-apartheid economic sanctions and the liberalisation of the South African economy. This led to a paradigm shift in the corporate strategy of South African firms, from conglomeration to focusing on core business, and this provided the impetus for the diversification

of operations internationally (UNCTAD 2005). These political and economic changes resulted in South Africa becoming one of the emerging global investors. As outward FDI can statistically be analysed in terms of flows or stocks, the countryôs OFDI flows and stocks from 2005 to 2013 are presented in Table 4.

**Table 4: South Africa's OFDI Flows and Stocks from 2005 to 2013**

| Year | FDI Outward Flows (US$ Millions) | FDI Outward Stocks (US$ Millions) |
|---|---|---|
| 2005 | 930 | 37 706 |
| 2006 | 6 063 | 50 826 |
| 2007 | 2 996 | 65 878 |
| 2008 | -3 134 | 49 956 |
| 2009 | 1 151 | 72 583 |
| 2010 | -76 | 83 248 |
| 2011 | -257 | 97 051 |
| 2012 | 2 988 | 111 780 |
| 2013 | 5 620 | 95 760 |

Source: UNCTAD Data (2014)

The net OFDI flows from South Africa in 2000, 2005, 2010, 2011, 2012 and 2013 were US$0.27 billion, US$0.93 billion, -US$0.08 billion, -US$0.26 billion, US$3 billion and US$5.6 billion, respectively. These figures show that the overall net outflows of FDI from South Africa were affected by the global financial meltdown starting in 2008 and accelerating in 2010 and 2011. South African TNCs are fully integrated into the world economy and changes in the international arena affect investments outside the country. In terms of OFDI stocks, in the years 2000, 2005, 2010, 2011, 2012 and 2013 South Africa held US$32.33 billion, US$37.71 billion, US$83.25 billion, US$97.05 billion, US$111.78 billion and US$95.76 billion, respectively. Although there is a slight decrease in OFDI stocks between 2012 and 2013, there is no evident explanation for this.

In general, South Africa experienced significant volumes of outward FDI flows and stocks. Hence, Nishiura (2009) points out that the OFDI stock of South Africa at the end of 2002 represented ñ0.4% of the world total, 3.5% of the developing world, 66.0% of the whole of Africa, and 71.7% of sub-Saharan Africaò. Similarly, UNCTAD (2010) reports that between 2006 and 2010 ñSouth Africaôs investments accounted for an average of 0.35% of global outward investment. During this period, 2.27% of the outward FDI stock from developing countries came from South Africaò. In fact, South African companies have invested in all continents. The situation of South African outward FDI changes by major destination from 1998 to 2010 is indicated in Table 5.

**Table 5: Outbound South African FDI Changes by Destination (R1 000 million)**

| Year | Total | Europe | Africa | China | UK | Lux | Mauritius | US | Austria | Nigeria |
|---|---|---|---|---|---|---|---|---|---|---|
| 1998 | 44 | 40 | 3 | 0 | 13 | 2 | 0 | 1 | 0 | -0 |
| 1999 | 46 | 38 | 1 | -0 | 34 | -2 | 1 | 2 | 11 | 0 |
| 2000 | 42 | 32 | 2 | 0 | -1 | 16 | 1 | 5 | -9 | 0 |
| 2001 | -31 | -31 | 3 | 0 | -16 | 1 | 3 | -1 | 15 | -0 |
| 2002 | -23 | -35 | -2 | 0 | -26 | -12 | -3 | 11 | 9 | 0 |
| 2003 | -9 | -5 | 3 | 0 | 8 | -4 | 1 | -6 | -16 | 0 |
| 2004 | 40 | 29 | 8 | 2 | 22 | 7 | 4 | 0 | 6 | 5 |
| 2005 | 18 | 24 | -5 | 2 | 6 | 24 | -5 | -1 | 1 | -0 |
| 2006 | 116 | 48 | 40 | 12 | 8 | 32 | 30 | 7 | 4 | 5 |
| 2007 | 94 | 38 | 25 | 17 | 13 | 16 | -1 | 2 | 0 | 22 |
| 2008 | 16 | -23 | 18 | -4 | 22 | -68 | 11 | 4 | 6 | -3 |
| 2009 | 71 | -31 | 13 | 72 | -28 | 12 | 5 | 7 | -12 | 2 |
| 2010 | 58 | 61 | 6 | -9 | 12 | 36 | 4 | -6 | 9 | -6 |
| Total | 480 | 184 | 116 | 93 | 68 | 61 | 53 | 25 | 25 | 24 |

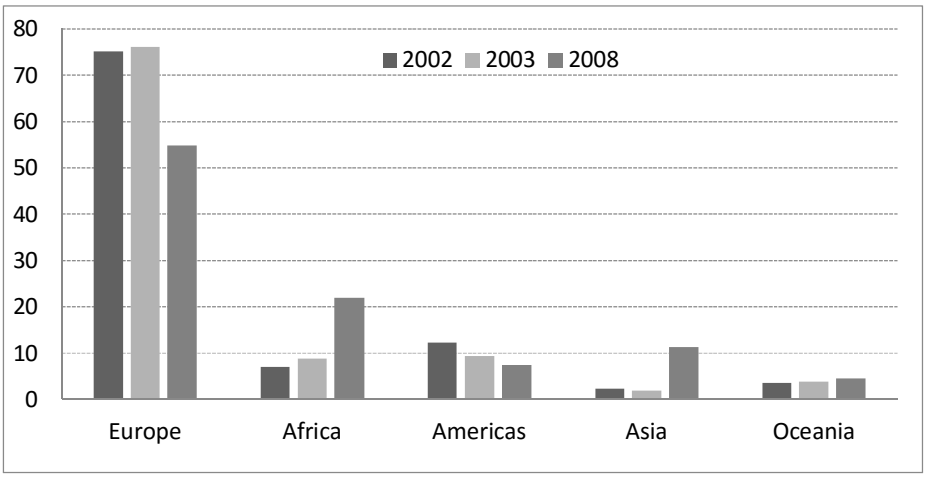
*Source*: Gelb (2010)

For historical reasons, South African firms have invested in some European countries, in particular in the UK and Luxembourg. But investments in the latter country do not really show an accurate destination of outward FDI, as Luxembourg is often used as a conduit for facilitating FDI flows into other countries (UNCTAD 2010). The South African Reserve Bank (SARB) reports that in 2002 the share of South African FDI outward stock in Europe stood at 75.1%, mainly influenced by the prevailing internal situation in the country after the end of apartheid, resulting in TNCs transferring their finances to safer destinations as they anticipated growing instability. Further information on South Africaôs outward FDI to Europe is provided by Gelb (2010), who reports that South African FDI stocks in Europe stood at 76.1% in 2003, but declined to 54.8% in 2008. Among the companies that moved their headquarters from South Africa to Europe are Anglo American Corporation and Rembrandt.

South African investments in North and South America, although quite significant in the 1970s, declined in the early 1980s because of the US governmentôs opposition to apartheid and the implementation of sanctions against the apartheid regime. The SARB reports that in 2002, the share of South African FDI outward stock in the Americas stood at 12.2%. Gelb (2010) reports a decrease in these stocks in 2003 and 2008 from 9.4% to 7.4%, respectively. The changes in South African outward stocks in 2002, 2003 and 2008 are presented in Figure 11. In 2002, although the investments by South African firms were lower in North and South America compared to those Europe, they were higher than the share of investments in Africa, Asia, and Oceania.

Figure 11 shows that the importance of Africa as an outward investment destination for South African investors has increased over time. UNCTAD (2011) reports that the share for Africa in South Africaôs outward FDI stock rose from 8% in 2005 to 22% in 2009. Davies (2012) also comments that ñtotal South African direct investments to the rest of Africa increased from R3.8 billion in 1994 to R115.7 billion in 2009ò, thus multiplying 31 times, and covered 36 African countries. In his 2013 budget speech, Finance Minister Pravin Gordhan stated that, during the period 2009 to 2013, the SARB approved over 1 000 large investment projects in 36 African countries. Likewise, in his 2014 budget speech, Gordhan noted that South Africa had become the second-largest developing country investor on the African continent, with diversified investments totalling R36 billion.

**Figure 11: South African OFDI Stocks in Africa, Europe, Asia and Oceania for 2002, 2003 and 2008 (R1 000 million)**




*Source*: Gelb (2010) and South African Reserve Bank (2002, 2003, 2008)

Even though South African FDI outflows grew from US$2.9 billion in 2012 to a record high of US$5.6 billion in 2013, with US$4.4 billion invested in Africa (UNCTAD 2014a), these investments are not evenly spread among countries across the continent. Africa Economic Outlook (2013) observes that ñthe main destinations for South African investment in Africa are Mauritius and Nigeriaò. UNCTAD (2013b) concurs that most of the South African outward FDI stock in Africa is held in Mauritius, but adds that ñsignificant amounts of FDI stock are also present in Nigeria and in two of South Africaôs neighbours, Mozambique and Zimbabweò.

Therefore, an accurate take on South African investments in Africa is that whilst ñSouth African investors play a large role in neighbouring countries in Southern and East Africaò (UNCTAD 2011), they are less significant and present in North Africa. In the Southern African region, South Africaôs investments are quite evident in neighbouring countries constituting the Southern African Customs Union (SACU) which, besides South Africa, include Lesotho, Botswana, Namibia and Swaziland. South African investments are also significant in all other 14 member states in the SADC region, and in East Africa they are predominantly found in Kenya and Tanzania.

The pattern of South African investments in the rest of Africa shows that geographical factors such as close proximity to South Africa, language, and policies for regional integration have a huge impact on investors. Games (2004) states that language barriers and a limited understanding of the inherited French legal system and administrative policies have limited South African

investments in Francophone African countries. In addition, Berkowitz and others (2012) observe that competition from European and North American companies has deterred South African enterprises from investing in North Africa.

South African outward FDI have also penetrated the other countries that constitute the BRICS (Brazil, Russia, India, China, and South Africa) bloc. In 2011, the BRICS share of investments stood at 20%, which is less but very close to the outward FDI stock in other African countries which stood at 23% (UNCTAD 2013b). Furthermore, among BRICS countries, South Africa shows the largest share of intra-BRICS investment, and in 2011 ñone-fifth of the outward FDI stock of South Africa was located in BRICS [countries], mainly in Chinaò. The second-largest investments were in the Russian Federation, followed by India and Brazil (UNCTAD 2013b).

### 6.2.2 South Africa's Energy Sector OFDI

South Africa is among the few countries in Africa with a well-developed and advanced energy sector. South African domestic firms in the energy sector have traditionally primarily focused on non-renewable energy, especially coal-mining and the provision of various services associated with coal-mining. Johannesburg Stock Exchange (JSE) listed companies in this category include the Waterberg Coal Company, Wescoal, South African Coal Mining Holdings Ltd, Resource Generation, and Coal of Africa. Coal mined has been used primarily in the countryôs power-generation activities by the state-owned enterprise (SOE), Eskom. Furthermore, fairly insignificant volumes of coal have been exported.

Recently, however, there has been an increase in the number of domestic companies focusing on renewables and alternative sources of energy, signifying a departure from dependence on coal. More importantly, some of the companies exploiting new energy sources are those that have been traditionally involved in coal-mining. Consequently, companies such as Eskom that were previously focused on non-renewable energy have now moved to a mix of renewables and non-renewables, and are working towards making ódirtyô energy sources producing much cleaner energy. The South Africa energy sector is also being diversified, gradually allowing for new entrants.

Domestic companies advancing renewables and alternative energy sources are members of the South African Renewable Energy Council, comprised of the South African Wind Energy

Association, the Southern Africa Solar, Thermal and Electricity Association, the Sustainable Energy Society of Southern Africa, and the South African Photovoltaic Industry Association. Some local companies have membership across these associations, which also accept membership from international companies that are not headquartered in South Africa. However, irrespective of whether these companies are focused on renewables or non-renewables, South African energy sector companies are involved in different aspects of the energy value chain, including electricity generation, infrastructure installation and maintenance, power distribution, training, manufacturing, safety, health and the environment, and support services.

Even so, many energy sector companies operating on the domestic scene have not internationalised their operations through direct investments and are, therefore, mainly involved in export-related activities, channelling domestic and internationally manufactured goods into the rest of the continent. For these reasons, the study has concluded that, whilst there are many local firms engaged in the energy sector, there are only a few South African energy sector TNCs involved in OFDI.

South African energy sector TNCs involved in OFDI include PetroSA, which has invested in oil and gas in Namibia, Gabon, Algeria, Nigeria, Iran, Qatar, Ghana, and Equatorial Guinea; Sasol, which mines coal and produce natural gas and condensate in Mozambique, oil in Gabon, and shale gas in Canada; Eskom Enterprises, which has investments in Mali, Mozambique, and Uganda; CAFCA Ltd, manufacturing and distributing electrical cables in Zimbabwe and Zambia; Gigajoule Power (Pty) Ltd, with direct investments in Mozambique; as well as Exxaro and the Consolidated Infrastructure Group.

There are also some South African TNCs, whose focus is not really energy as such that have investments outside South Africa (including power-generation), *inter alia*, those in sugar production, such as Tongaat-Hulett Ltd, which operates the Mkwasine, Hippo Valley and Triangle sugar estates in Zimbabwe, and Illovo Sugar Ltd, with sugarcane plantations in Malawi, Tanzania, Swaziland, Mauritius, Zambia and Mozambique; and those in the pulp and paper industry, such as Sappi and Mondi. Sugar-production activities generate some electricity and bio-energy, whilst the pulp and paper industries manufacture charcoal as a by-product, as well as producing some bio-energy. Although attention is drawn to these companies, they cannot be considered energy sector TNCs.

Even though there are quite a number of South African energy sector companies operating in the domestic arena, only a few TNCs have operations in other countries, and even fewer are involved in other countries through OFDI. An energy project normally comprises of the following actors:

1. *The Project Owners*: these are profit-making South African energy sector TNCs involved in OFDI, which own 10% equity shares or more in the investment, as well as having a say in the management of operations. A few South African companies can be classified as project owners, and these include investments made by Sasol in Mozambique and Canada, Eskom in Mali (see Box 3) and Uganda, PetroSA in Ghana, and Gigajoule Power (Pty) Ltd in Mozambique.

**Box 3: A Brief on the Eskom Investment in Mali**

Although Eskom Enterprises was involved in the energy sector in Mali, the company has since divested. However, at the time of this study, the process of divestment had not yet been fully completed. Hence, this investment has to be mentioned.

2. *Engineering, Procurement and Construction Management (EPCM) Firms*: these are companies contracted by the project owner to conduct EPCM activities. They are involved in project development, as well as the maintenance of infrastructure, once the project has commenced. There are many South African firms that would fit into this category, including Aveng, Group Five, and Murray & Roberts. EPCMs enter into contracts with specialised goods and services providers, including original equipment manufacturers (OEMs) for the direct supply of hardware and machinery.
3. *Project Funders*: these are funding institutions that provide financing to the project owners, including development funding institutions, banks, and capital or investment companies. The Standard Bank Group, Nedbank Ltd, the Industrial Development Corporation (IDC) and the Development Bank of Southern Africa (DBSA) are the key institutions based in South Africa involved in financing projects in the energy sector outside of South Africa. This funding is either in the form of loans, or OFDI.
4. *Training and Advisory Services Firms*: these are firms that provide legal, financial, training, and other non-engineering, procurement, and construction management services. They assist with the operational and strategic management of the project, especially by providing training and advisory services, as well as catalysing and ensuring systems integration. Training services are mainly provided in the areas that have a direct impact of project development, and also on safety, health and the environment (SHE). At times, advisory services firms, such

as Mitochondria, perform community consultancy activities on behalf of the project owner or the EPCM, and also assist with aspects related to SHE.

South African energy sector TNCs get involved in projects abroad through responding to tenders or invitations by TNCs operating projects in other countries, or are involved as project owners investing capital in brownfield or greenfield operations. Whereas subsidiaries of TNCs are engaged in the day-to-day operations of the project in a given country, the TNC headquarters in South Africa performs a general oversight role.

## 6.3 THE EXERCISE OF SOVEREIGNTY PRINCIPLES BY SOUTH AFRICA

### 6.3.1 Explicit Policies and Direct Institutions for Energy Sector OFDI

South Africa does not have an explicit national policy or direct national institutions for OFDI. Moreover, the country does not have any energy sector-specific OFDI policies and institutions. Intrinsically, energy sector OFDI is advanced through a set of implicit policies and indirect institutions. Thus, the country has not openly exercised sovereignty principles to direct national and energy sector OFDI. Without explicit policy frameworks and direct institutions for energy sector OFDI, TNCs have to conduct direct investments on their own and with little, if any, support from the government.

### 6.3.2 Implicit Policies and Indirect Institutions for Energy Sector OFDI

There are a number of implicit policies and indirect institutions for energy sector OFDI, which means South Africa passively regulates outflows. Implicit policies that govern OFDI from South Africaôs energy sector are those relating to foreign exchange. Intrinsically, Gelb (2010: 5) asserts that ñthe only regulation of OFDI is that South African residents, including corporations, are still subject to exchange controlsò. Institutionally, the President of South Africa is the highest authority empowered by Section 9 of the *Currency and Exchange Act* (Act No. 9 of 1933) ñto make regulations in regard to any matter directly or indirectly relating to, or affecting, or having a bearing upon, currency, banking and exchangesò (Exchange Control Manual 2014). However, these powers are delegated to the Minister of Finance and the National Treasury, and they are responsible for regulating OFDI through the exchange control policy. In this regard, the Ministry

of Finance and National Treasury implicitly affects South African energy sector OFDI and TNCs through their formulation of exchange control policies.

However, the Minister of Finance does not implement the exchange control policy directly, but exercises this through delegated authority to various individuals in the line ministry. As such, delegated authority is exercised by the Governor and Deputy Governor of the South African Reserve Bank (SARB), and the General Manager, Deputy General Manager and Assistant General Manager of the SARBôs Financial Surveillance Department (FSD). The implementation and administration of exchange control policy falls under the SARB, which was established as the countryôs central bank in 1921 in terms of Section 9 of the *Currency and Banking Act, 1920* (Act No. 31 of 1920), replaced by the *South African Reserve Bank Act, 1944* (Act No. 29 of 1944), and amended by the *South African Reserve Bank Act, 1989* (Act No. 90 of 1989) and the *South African Reserve Bank Amendment Act, 2010* (Act No. 4 of 2010). Within the Reserve Bank, the FSD has duties that have a direct impact on OFDI through its mandate to implement exchange control rules and regulations. The FSD also interacts with the National Treasury through a Technical Committee on Exchange Control Issues. The technical committee is composed of officials from the FSD and other Reserve Bank departments, and it troubleshoots any operational and systems issues in relation to exchange controls. Thus, the effect of the SARB on energy sector OFDI are indirect and related to the monetary policy the Bank sets, as well as the implementation of exchange control rules and regulations.

The SARBôs FSD interacts with energy sector TNCs through óauthorised dealersô. These are ólegal personsô authorised by the National Treasury to deal in foreign currency and matters of foreign exchange, including financial institutions such as banks. Authorised dealers may process and facilitate applications for foreign exchange and foreign bank accounts without reference to the FSD, if these applications fall within the parameters outlined in the Exchange Control Rules. In cases where the amounts to be transferred are higher than the set amount, authorised dealers assist with applications and submissions for approval by the FSD. Therefore, authorised dealers affect energy sector OFDI as they are the institutions that directly interact with TNCs, assessing their applications for money transfers, transferring the applicable acceptable amounts, processing amounts that are not normally allowable through the SARB, and receiving transfers of money from investments. Authorised dealers implicitly affect energy sector OFDI as conduits that facilitate the movement of funds between the headquarters of TNCs and their subsidiaries,

between these companies and their service providers, as well as between firms and their external stakeholders.

Besides the institutions and policies dealing with exchange controls, there are other important national institutions that indirectly affect energy sector OFDI. The Department of Trade and Industry (DTI) is nationally central in matters dealing with FDI, including OFDI. The DTI makes reference to investment through its mission statement ñé to provide a predictable, competitive, equitable and socially responsible environment, conducive to investment, trade and enterprise developmentò (DTI 2014), as well as to its strategic objective that aims ñto create a fair regulatory environment that enables investment, trade and enterprise development in an equitable and socially responsible mannerò (DTI 2014). In addition, a special DTI theme on trade, export and investment aims to develop programmes, amongst other activities, and ñfocuses on increasing [the] levels of international trade, foreign direct investment, and economic co-operation é [at the] regional, continental and international levelsò (DTI 2014). Within the DTI, the International Trade and Economic Development Division primarily contributes towards creating the conditions that promote inward and outward investment. Activities that focus on investments are geared to strengthen trade and investment links through, *inter alia*, the handling and signing of BITs and MOUs, and participating in discussions and research on regional and multilateral economic treaties. These resultant BITs and MOUs may have an effect on energy sector OFDI from South Africa.

An important agency for FDI under the DTI is a one stop facility, Trade and Investment South Africa (TISA), whose services include investment recruitment, providing investment information, facilitating investment, investment aftercare services, the promotion of domestic investment, and outward investment. TISA activities that relate to energy sector OFDI include introducing South African energy sector TNCs to national IPAs and government agencies in other countries, introducing South African energy sector investors to projects and key stakeholders in the private and public sectors abroad, and supporting South African TNCs on project-financing and deal-structuring with financial institutions. Yet, prior to 2013, TISA offered limited services and support to South African OFDI into Africa and no support whatsoever to OFDI by South African TNCs to the rest of the world. However, from 2013 onwards, OFDI by South African companies into Africa has become a prime priority area for TISA. But then, this new focus on Africa had the adverse effect of relegating other regions within TISAôs scope of activities to positions of lesser importance.

OFDI from the energy sector is also facilitated by the Department of International Relations and Co-operation (DIRCO), which conducts foreign affairs and bilateral and multilateral co-operation through 46 bilateral and 1 multilateral Africa-focused and stationed missions, 17 missions in the Americas and the Caribbean, 27 missions in Europe, 32 missions in Asia and the Middle East, and 2 multilateral missions abroad (DIRCO 2012). These missions are classified as High Commissions (in Commonwealth countries), Embassies, and Consulates. DIRCOôs activities with an effect on energy sector outward investment are mainly enshrined in Outcome 11 of the Delivery Agreement, in which the South African government seeks ñto create a better South Africa and contribute to a better and safer Africa in a better worldò through an enhanced African agenda and sustainable development, regional integration, reformed global governance institutions, and trade and investment. Thus, DIRCO indirectly facilitates OFDI through building good political and economic relations with other countries, and preparing the terrain for South African energy sector investors to smoothly invest in these countries.

Through its focus on economic diplomacy and economic diplomacy training, DIRCO ensures that personnel in South Africaôs missions abroad understand economic issues and are well-versed to act as conduits for economic information which may be useful for energy sector OFDI. Economic diplomacy activities with an effect on energy sector OFDI include activities to increase value-added exports, attract FDI to priority sectors, promote tourism, and encourage the removal of non-tariff barriers. DIRCO missions host or participate in trade seminars and tourism promotion, and engage with chambers of commerce, high-level investors and relevant ministries.

The Presidency and the South African Parliament also play a vital role in South Africaôs energy sector OFDI policy frameworks and institutional structures. Whilst Parliamentôs role is to provide for oversight and accountability, the Presidency is mainly involved in giving policy advice to, and participating in, organised trade and investment delegations abroad. These delegations oftentimes include South African businesspeople. Furthermore, when Parliament debates and accepts an investment law, especially bilateral and multilateral conventions and treaties, the President has to sign them off.

Above and beyond these national policies and institutions at sector level, line ministries and departments also play an important role in investments made by SOEs abroad. In this regard, important government ministries and departments include the Department of Public Enterprises

(for example, providing management oversight for Eskom Holdings Ltd), the Department of Energy, the Department of Minerals, and the Department of Environmental Affairs, amongst others. However, the way in which national institutions, policies and legal instruments affect South African energy sector TNCs differs from case to case. Non-state-owned South African energy sector TNCs make their investments with little to no support from national institutions. A Group Five official commented:

> There are some countries where we go out there on our own as a business entity without much support from the South African government, unlike SOEs. Also, we sometimes try to pull in the government later, after investing –at times with success, and at times without success (Interview with Group Five Official, 13 August 2014).

Conversely, South African state-owned energy sector TNCs are supported by national institutions before, during, and after investments. To exemplify this, a DTI official observed that in November 2001, South African President Thabo Mbeki and a trade delegation visited Mali, his entourage including Eskom staff members who used the opportunity to boost Eskomôs business deal won through an international bidding process in July 2001 (Interview with DTI Official, 19 August 2014). In addition, sometimes state-owned TNCs receive *ad hoc* government support, especially when they are in search of resources that are considered as nationally strategic, as demonstrated by PetroSAôs investments in oil in various countries. But, what is apparent is that South African energy sector TNCs generally make individual company decisions to invest abroad.

Although non-state-owned South African energy sector TNCs comply with various national policies, including exchange control and tax requirements, the lack of an explicit OFDI policy creates a feeling among such companies that they do not get adequate and sufficient support from national public institutions. They also generally view the policies that the state enacts as aimed at simply securing more revenues, rather than caring about the efforts involved in realising these revenues.

There are also a number of regional and international instruments and institutions that have an implicit effect on South African energy sector TNCs engaged in OFDI. There is no indication, however, that the state actively exercises sovereignty principles so that these international regimes can be of direct use to energy sector TNCs involved in OFDI. Therefore, TNCs (including SOEs, such as Sasol, PetroSA, and Eskom) have to try to harness the available

international regimes on their own in support of their individual investment activities. For purely public relations purposes, SOEs like Sasol, PetroSA and Eskom have actively participated in regional and international energy and environment forums, such as the UNFCCCôs COP 17 in Durban. Thus, South African TNCs have not dared venture into the area preserved for sovereign states – domesticating international regimes in their individual investment activities.

In those arenas reserved for TNCs and where they need no state assistance, South African energy sector-based TNCs have engaged with existing international voluntary mechanisms governing their activities, for example, subscribing to the UN Global Compact. This is an international initiative that addresses human rights, labour, environmental and corruption issues through a commitment to 10 principles derived from the Universal Declaration of Human Rights, the International Labour Organisationôs Declaration on the Fundamental Principles and Rights at Work, the Rio Declaration on the Environment and Development, and the United Nations Convention against Corruption. Sasol has joined the UN Global Compact in 2001 and Eskom in 2003, but PetroSA has not been a signatory. Both Sasol and Eskom find membership of the Global Compact important for their investments, including for OFDI, as they believe that it assists in maintaining and enhancing the reputation of their companies by showing that they adhere to transparent systems.

Another important institution for energy sector OFDI from South Africa is the World Bankôs Multilateral Investment Guarantee Agency (MIGA). In 2003, MIGA issued insurance guarantees to Sasol for its Sasol Petroleum Temane Limitada Project in Mozambique for a period of up to 13 years against the risks of transfer restrictions, expropriation, war and civil disturbances, and breach of contract. Likewise, in 2000, MIGA issued two guarantees totalling US$69.4 million to Eskom ñto cover loan guarantees to the European Investment Bank and the Japan Bank for International Co-operation for their investments in Motraco-Mozambique Transmission Company SARLò (World Bank MIGA 2014). This on-going project involves the construction and operation of electricity transmission lines that will interconnect South Africa, Swaziland, and Mozambique.

In terms of regional institutions and policies, Eskom is a member of the Southern Africa Power Pool (SAPP), a body resorting under the SADC. The SAPP came into being as a result of an Inter-Governmental Memorandum of Understanding (MOU) signed on 28 August 1995, and is governed by this and three other agreements namely, an Inter-Utility Memorandum of

Understanding, an Agreement between Operating Members, and an Agreement on Operating Guidelines. The SAPP is, therefore, an amalgamation of electricity utilities in the SADC region, the key aim of which is to provide a reliable and economical electricity supply to the consumers of each of the SAPP members.

Furthermore, South African investments in countries in the Southern African region are protected under the SADC Protocol on Finance and Investment. Thus, Sasolôs investments in Mozambique and trans-frontier investments, such as the Southern Africa Regional Gas Project involving Sasol and ROMPCO (Republic of Mozambique Pipeline Investments Company), are protected by way of a cross-border government-to-government agreement. In this case, South Africa and Mozambique signed a Memorandum of Understanding on Natural Gas Trade in 1996, transformed into a fully-fledged Agreement in 2001, which served to boost the facilitation OFDI by South African companies, such as Sasol, even further. Similarly, considering Eskomôs investments in Mozambique, an Inter-Governmental Memorandum of Understanding on the North Mozambique Power Development Initiatives was signed in 2003.

BITs are also among the main instruments that South African energy sector TNCs regard as imperative and directly protective of, as well as a catalyst for, their investments abroad. In this regard, South African investments in Mozambique are protected under the Agreement and Protocol for the Promotion and Reciprocal Protection of Investments signed in 1997. Equally, South African investments in Ghana are protected under the Agreement for the Promotion and Protection of Investments signed in 1998. The protection offered in these agreements and protocol also extents to energy sector companies, such as Sasol, Eskom, and PetroSA.

Double taxation treaties also encourage OFDI by South African energy sector TNCs. The Convention for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income and on Capital Gains was signed between South Africa and Ghana in 2003 and entered into force in 2009, thus acting as a catalyst for OFDI by PetroSA. Similarly, the Convention for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income signed between Mozambique and South Africa in 2007 and entered into force in 2009, serves as an enabling instrument for OFDI by South African energy sector companies such as Sasol.

## 6.4 GOVERNMENT-IMPOSED DISTORTIONS ON ENERGY SECTOR OFDI

Since the South African government passively regulates energy sector OFDI, it has not imposed distortions directed at FDI outflows. In terms of fiscal incentives, the main distortions that the government has exploited are in the form of taxes, especially double taxation agreements (DTAs). In 2013, for example, South Africa announced a review of its DTA with Mauritius to allow for double taxation. This measure was aimed at limiting OFDI by South African TNCs that are investing in Mauritius, and then use that country as a base to do further investments in Africa. By imposing double taxation, South Africa has raised the costs of doing business through Mauritius, and made it easier for companies to make direct investments into Africa. However, the effects of this policy reversal are general and indirectly affect energy sector firms, since this measure is not targeted specifically at energy sector TNCs.

Another government-imposed distortion with regard to OFDI from South Africa that has an indirect effect on energy sector TNCs include direct government policy intervention through the ógateway to Africa and Other Reforms Initiativeô, which create incentives primarily for TNCs to invest in Africa rather than in other regions of the world. This initiative is aimed at making South Africa an economic gateway to Africa by relaxing foreign exchange controls for Africa-focused investments, and attract large international companies to use the country as a base for their forays into the continent. Thus, companies listed on the JSE may establish one subsidiary (a HoldCo, or Holding Company) to conduct African and offshore operations, which will not be subject to any exchange control restrictions. In 2014, these arrangements were also extended to non-JSE listed companies. In 2013 and 2014, the key arrangements made under the ógateway to Africa and Other Reforms Initiativeô affecting OFDI were:

1) The amount a parent company may transfer to a HoldCo was increased from R750 million to R2 billion per year. Furthermore, the SARB could consider applications for transfers of up to 25% of the companyôs market capitalisation. However, these applications should provide evidence and demonstrate the benefits to South Africa.
2) Restrictions on transfers into and out of a HoldCo, up to the allowed amount, were removed. But, the parent company making transfers is subject to regular reporting and supervision for tax purposes.
3) The listing of a HoldCo and joint ventures are considered on a case-by-case basis.
4) All HoldCos are permitted to use a foreign functional currency, rather than South African Rands in determining their tax calculations.

5) Some tax concessions that are made annually in the National Budget are also applicable to companies that register offshore holding subsidiaries and retain a South African tax residence and management control.

The major aim of these arrangements was to streamline the promotion of OFDI from South Africa by removing the requirements to make applications to the SARB for small amounts of money and go through sometimes lengthy approval processes. These arrangements lessen the administrative burden on firms and ease the processes associated with doing business in Africa for energy sector TNCs ï thus, promoting OFDI.

## 6.5 THE EXERCISE OF STRUCTURAL POWER

In a situation where the sovereign state adopts a hands-off approach and passively regulates OFDI, the exercise of structural power becomes limited. Thus, there is no evidence of where the state exercised structural power to co-ordinate or built synergies for energy sector OFDI from South Africa. However, there may be anecdotal evidence of some *ad hoc* interventions by the state to generally promote trade relations which may have an effect on OFDI. For example, the Presidency and DIRCO may undertake structured trade and investment visits abroad and arrange exhibitions that may also involve South African energy sector TNCs – hence, facilitate or promote OFDI. Similarly, TISA may provide advice to South African energy sector OFDI firms, when approached. But these actions are not so co-ordinated or well-planned that they demonstrate a clear exercise of structural power by the state at national level. Likewise, at the international level the exercise of structural power by the state to effectively harmonise domestic policies and institutions with international regimes for OFDI in general, and energy sector OFDI in particular, is non-existent.

## 6.6 ENERGY SECTOR OFDI AND THE TRANSFER OF ESTs

### 6.6.1 South African Energy Sector OFDI and the Transfer of Technologies: A Sector Analysis

The presented study findings so far point to the passive involvement of the state in OFDI activities. Hence, the analysis of whether South African energy sector OFDI transfers technologies have a direct bearing on the activities of individual TNCs, operating with little to

no state support. In this regard, the study analysed the actions of project owners, project funders, EPCMs, and training and advisory firms in relation to the lifecycle of a project.

Using the project cycle as a key reference point, it is clear that new technologies in the form of machinery and hardware (equipment) are usually and primarily transferred during the project development phase by EPCM firms through contractual agreements with OEMs. However, the transfer of technologies at this stage may be considered not that important as, of necessity, they are required and should have been transferred for the project to be launched. In some cases, the technologies that South African energy sector TNCs transfer during project development to African countries are far more advanced than the rather inappropriate ones available in the local market. Furthermore, when these technologies are movable assets in the form of machinery and owned by the EPCM, they may be redeployed elsewhere as soon as the project development phase is completed.

The project development stage also involves training and advisory services firms, bringing in knowledge and skills useful for the project going forward. However, ñshort lead-times imposed by project owners on EPCMs and training and advisory services firms make it difficult for in-depth knowledge and higher-level skills to be transferred during the project development phaseò (Interview with Mitochondria Official, 22 August 2014). And so the technologies that energy sector TNCs transfer during the project development stage are mainly the machinery and hardware that is the lifeblood and very core of the projectôs existence.

Apart from the transfer of equipment for use in project development, both EPCMs and training and advisory services firms do not transfer the blueprints and designs pertaining to these technologies. As a Mitochondria interviewee stated:

> The transfer of our designs and blueprints can happen when they are old and no longer that useful. In business, we jealously guard our designs because they are the core that determines whether we remain in business or not. Once a business gets access to the blueprints, be they for machinery or for a production process, then anything can happen (Interview with Mitochondria Official, 22 August 2014).

In addition, during the project development phase, training and advisory services firms usually engage experts and skilled personnel, especially knowledgeable and skilled expatriate staff members and not many locals, which limit the transfer of knowledge to host countries. Based on

the above explanations, it is found that, whilst new machinery or hardware is transferred during the project development stage, there is little if any transfer of designs/ blueprints, as well as skills and knowledge. Moreover, transferred technologies during the project development phase do not have a widespread impact on the industrial structure of the country. Therefore, there is no significant empirical evidence of a holistic transfer of technologies by South African energy sector TNCs involved in OFDI during the project development phase.

Once the project has been fully established and constructed, the project owners assume management of the project at the production or operational stage. Most of the hardware needed at this stage is spare parts and components for maintenance, the supply of which depends on the TNCs in-house technological capabilities and capacities, essential for the company to be able to make the necessary modifications on, or upgrading of, existing equipment or machinery. In terms of soft technologies, this stage demands sophisticated managerial and organisational skills.

In general, during the production stage, technologies in the form of production machinery, spare parts, components and other hardware continue to be transferred internally between the parent company and the subsidiary, especially when the project owner has some in-house manufacturing capabilities, as is the case with Sasol. However, where the project owner does not have such capabilities and capacities, as is the case with Eskom and PetroSA, their subsidiaries acquire technologies in the form of hardware and machinery from the market, particularly through imports. As a PetroSA interviewee conceded:

> The truth is that South Africa does not yet have much in-country manufacturing capabilities for machinery and hardware related to the energy sector. This means we are much more of a conduit through which technologies from those countries with capabilities pass in order to get to other African countries. Thus, our contracts in many other countries are fulfilled through networking and imports (Interview with PetroSA Official, 22 August 2014).

Thus, the lack of manufacturing capabilities and capacities among some South African energy sector TNCs makes them dependent on imports, limiting the transfer of know-how and hindering technology transfer through R&D activities. The adoption, adaptation and further development of imported equipment may only occur through on-the-job training by TNC employees working with colleagues in their subsidiaries.

South African energy sector TNCs with in-house manufacturing capabilities may well facilitate the transfer of technical skills to local employees in host countries. This is evident in the Sasol Mozambique investment, which includes an internship programme at the Mozambique Central Processing Facility, catering for school-leavers through training in various trades and equipping them with skills that will make them gainfully employable. PetroSA has not established any training programmes in its subsidiaries, although it has strong manufacturing capabilities in South Africa, because there are no laws obliging it to do so in the countries in which it has invested. Hence, in the case of PetroSA, it is found that R&D and other manufacturing capabilities have remained localised at the headquarters level.

The above findings show that OFDI from the South African energy sector generally transfers technologies in the form of hardware and machinery. But, does this OFDI transfer ESTs as well? This studyôs findings on this score are not very positive. Ideally, when OFDI from the energy sector transfers new hardware or machinery during project development phases in greenfield investments, the FDI should have facilitated the transfer of more efficient machinery for production and less-polluting technologies when compared to the transfers of outdated and antiquated technologies.

The investments of Sasol and PetroSA are primarily in highly polluting energy sources. PetroSAôs investment in Ghana is in oil, which is highly polluting. Thus, its investments and technologies cannot be considered as environmentally friendly or environmentally sound in the long-term. Sasolôs investments are in coal and gas, and transforming gas to liquid fuels. Whilst Sasolôs investments are much cleaner than the direct use of coal, in the long-term they are not as environmentally sound as would be investments and technologies in renewables, such as in photovoltaic power and wind energy. Eskom is the only exception, investing in both Mali and Uganda in hydro-power, a considerably cleaner source of energy.

The transfer of hardware or machinery focused on renewables and alternative sources of energy by South African energy sector TNCs through OFDI has not yet materialised. Judgements can, therefore, not be made on whether such OFDI would be environmentally sound and friendly, or not. In fact, South African energy sector TNCs is still heavily dependent on the importation of technologies from other countries, since they do not have the requisite technological capabilities and capacities. Consequently, energy sector TNCs from South Africa cannot be considered as capable of transferring ESTs associated with renewable and alternative sources of energy. What

is apparent, however, is the necessity of building technological capacity that would enable South African TNCs to manufacture and engage in exports and OFDI on the ESTs that they are currently importing. Then again, technology capacity-building should go hand in hand with assessments on the uptake of ESTs because, whilst internal demand for renewable energy technologies in South Africa is high, the demand for these in the rest of Africa is not supported by the actual uptake, as financing act as a barrier. Hence, South Africaôs investments in the capacity-building of domestic firms to become leaders in producing ESTs should take into cognisance market factors as well.

The transfer of ESTs in terms of tacit knowledge by South African energy sector TNCs may occur given that South African project owners and training and advisory services firms have the necessary internal capacities and capabilities to serve as conduits for transferring knowledge on the environment, as well as skills relating to environmental audits and reporting. PetroSA has ISO 9001:2000 international accreditation, in addition to ISO 9001, ISO 14000 and ISO 18000 certifications; and Sasol has ISO 14001:2004, ISO 9001:2000 and OHSAS 18001:1999 certifications, also covering Mozambique. Eskom has essentially similar certifications, namely ISO 9001:2004 in quality, ISO 14001:2008 on the environment, and OHSAS 14001:2008 in health and safety, which is also applicable to Eskom Uganda Ltd. This evidence shows that South African energy sector TNCs do possess soft technologies that may make energy production and transmission processes environmentally sound.

The limiting factor to the transfer of soft technologies is that when project owners in the energy sector, such as Eskom, PetroSA and Sasol, contract experienced South African training and advisory services firms to deal with environmental management processes, they do so at headquarters level and not at the project level. The same top-down approach is followed with the control of environmental management processes and matters associated with health and safety. Reporting on SHE is also controlled and performed at headquarters level. Hence, it is found that the transfer of soft technologies and knowledge associated with SHE from South African energy sector TNCs to subsidiaries and, ultimately, to host countries is rather limited.

Having said this, the question that still remains unanswered is: How connected are the South African energy sector TNCs to local firms in the countries they invest in? The studyôs findings are that South African energy sector TNCs do not consciously build relationships with domestic companies in host countries during the project development and launching phases, but that they

do so in the long-term. In many African countries, project owners of South African origin tend to rely on supporting South African firms during the project development and launching phases. This creates clusters of foreign, South African energy and supporting entities in the host country, especially where host country legislation does not provide for local participation.

However, some African countries that have hosted South African energy TNCs have not developed energy sector policies that would have facilitated interactions between domestic and foreign companies, because they invite the intervention of these companies when they are already facing energy crises. In such situations, these countries pursue investments and energy security, but do not enact or enforce local participation policies. Examples of such countries are Namibia, Botswana and Zimbabwe and, in such circumstances, foreign firms determine the type, level and extent of participation of local firms in any energy project. Therefore, most foreign firms, in particular South African firms, contract experienced South African firms for project development and management duties. Consequently, they are able to meet project lead-times and execute the project within approved budget allocations, rather than engaging domestic firms which may entail cumbersome and time-consuming capacity-building exercises.

Moreover, South African project funders demand of South African project owners to demonstrate local participation and local procurement, meaning the participation of South African firms and procurement of goods and services from South Africa. In order to deal with this funding requirement, most South African project owners contract South African EPCMs and training and advisory services firms. Again, this limits linkages with domestic firms in host countries.

### 6.6.2 A Firm-Level Case Study on OFDI-Carrying ESTs

In order to shed light on OFDI and the transfer of ESTs from a home country perspective, this section presents a firm-level case study of investments by Eskom Enterprises (Pty) Ltd in Uganda through Eskom Uganda Ltd.

**Box 4: A Brief on Eskom Enterprises (Pty) Ltd**

Eskom Enterprises (Pty) Ltd is the investment arm of Eskom Holdings Ltd, a South African SOE with its headquarters in Johannesburg, South Africa. The main business of Eskom Holdings is electricity generation. Eskom Enterprises has been involved in OFDI in the energy sector on the

African continent in Mali, Mozambique, and Uganda. It holds a 100% ownership stake in Eskom Uganda Ltd, an outward foreign direct investment (OFDI) entity and a subsidiary of Eskom Enterprises, but operating independently inside Uganda.

Although Eskom Uganda Ltd was incorporated on 22 November 2002 and awarded the concession to operate and maintain both the Nalubaale and Kiira hydro-power stations in Jinja until December 2023, it effectively took over operations and maintenance of the stations from the Uganda Electricity Generation Company Ltd (UEGCL) on 1 April 2003. The main business of Eskom Uganda Ltd is electricity generation from hydro-power. This means that the dams, powerhouses, switchyard facilities, high-voltage substation, land, and movable property are facilities and assets that are operated and managed by Eskom Uganda. Whilst Eskom Uganda is managing these facilities, the UEGCL remains the owner of the properties; in future, the plant will revert to the UEGCL at the end of the 20-year concession period.

A power-purchase agreement signed by Eskom Uganda ensures that the electricity generated is supplied to the Uganda Electricity Transmission Company Ltd, which sells it to Umeme Ltd (a Ugandan energy distribution network company) for delivery to local consumers. The current average production is estimated to be between 138MW and 158MW on a backdrop of a total installed capacity of 380MW for the two plants, distributed as 180MW for the Nalubaale plant and 200MW for the Kiira plant. Hence, Eskom Ugandaôs average electricity production is ñbelow half the installed electricity generation capacity, because of water rationing by water authoritiesò, machinery breakdowns and ageing and obsolete equipment utilised in the electricity generation process (Interview with Eskom Official, 23 July 2014).

The OFDI by Eskom Enterprises in Uganda took place in 2002, and there are no clear and explicit South African national or sector-specific OFDI policy instruments that could have facilitated and promoted this investment. Hence, South Africa did not exercise sovereign state principles. The decision to invest in Uganda was taken by Eskom Enterprises alone, passively supported by the government. The investment was motivated by the desire of Eskom Enterprises to pursue and fulfil the New Partnership for Africaôs Development (NEPAD) agenda and the African Renaissance initiative that President Thabo Mbeki was championing at the time. Thus, the bid of Eskom Enterprises in Uganda and the creation of Eskom Uganda Ltd were totally in line with the governmentôs position and vision of ensuring enhanced interaction between South Africa and African countries, and the creation of pan-African institutions that would deliver services to the

African peoples. A Department of Energy official conceded that ñentering into Uganda was not really at the backdrop of our business capacity or the profitability of the deal, but based on the African Renaissance and NEPAD hype and euphoria at that timeò ( Interview with Department of Energy Official, 23 July 2014).

At company level, the *Eskom Conversion Act* of 2002 converted Eskom from a statutory body to a public company with the South African government as the sole shareholder. As a public company, Eskom Holdings Ltd now falls directly under the Department of Public Enterprises, and for its investments (including OFDI) it is directly accountable to the Eskom Board, which reports to this line department. But other departments, such as the Department of Energy and the Department of Minerals, also have direct and indirect influence over Eskomôs activities and investments abroad.

Implicitly, the Presidency is involved in providing advisory oversight on how SOEs should go about investing in other African countries. Furthermore, the President played a diplomatic role by leading political and economic delegations to Uganda, which also included Eskom Enterprises staff members. Other national institutions that were implicitly involved in the investment include the Ministry of Finance, the National Treasury, and the SARB. They facilitated the investment through processing transfers of funds from South Africa to Uganda, including the transfer of an initial US$500 000 immediately after Eskom Enterprises won the bid. Since then, over US$10 million had been transferred over the 10 years of operation in Uganda.

Although there was no direct country-to-country agreement on the Eskom investment in Uganda, a BIT (an Agreement for the Reciprocal Promotion and Protection of Investments, as well as a Protocol) was signed in 2000 between South Africa and Uganda. This served as a timely catalyst and an indirect enabler for Eskomôs investment in the country through its subsidiary, Eskom Uganda Ltd. Furthermore, a Memorandum of Understanding between South Africa and Uganda on Co-operation on Issues Related to Public Works and Infrastructure Development was signed in 2011, indirectly paving the way for Eskom and other South African TNCs to further move into power-infrastructure development in the country. As alluded to earlier, the Convention for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income, which is a DTA between South Africa and Uganda, was already signed in 1997 and timeously entered into force in 2001. This DTA, therefore, may be viewed as having indirectly

promoted Eskomôs investment in Uganda, as the company would not be subjected to double taxation on incomes.

International instruments and institutions that directly and indirectly facilitate investments are quite limited, as they usually do not have much effect at the company level. Eskom Holdings Ltd and its subsidiaries are aligned with international sustainability óbest practicesô on reporting, including the Global Reporting Initiative, the Sustainability Reporting Guideline, and the 2008 AA1000 Accountability Principles Standard. Furthermore, the firm and its subsidiaries is a member of the World Business Council on Sustainable Development (WBCSD) and the Partnership against Corruption Initiative of the World Economic Forum (WEC), which are institutions that advance an investing companyôs reputation as they have specific codes of conduct on investments and operational issues that have to be adhered to.

Despite of all this, the question remains: Has there been a transfer of technologies through this Eskom investment? Eskom Uganda has been operating and managing ageing and obsolete equipment and components in its plants, subject to modernisation or replacement. But, since it not the owner of the plant, it had to jointly analyse the status of the plant, including the equipment and components, and jointly design an agreeable intervention plan with the plantôs owner. The main course of intervention has been the replacement of ageing and obsolete equipment and components. Consequently, thus far Eskom Uganda has provided funding for the replacement of the direct current system, the installation of vibration monitoring systems, the installation of a partial discharge system, the replacement of transformers, and the replacement of circuit breakers, amongst others.

The transfer of hardware and machinery by Eskom Enterprises to Eskom Uganda is limited, as the latter has to operate independently. Moreover, Eskom Enterprises does not have in-house manufacturing capacity for electricity generation equipment and components to be able to transfer these to its subsidiary. Consequently, Eskom Uganda primarily depends on imports of equipment and components from the open market, and not the in-house transfer of technologies. In addition, although Eskom Holdings has some in-house R&D capacities in South Africa, the company has not built any R&D facilities at its subsidiary in Uganda. As a Ugandan parliamentarian lamented:

> The Eskom deal was something we welcomed, thinking that since the company is African and provides electricity to a much more developed country, South Africa, it will deliver to our small and less-developed country. However, Eskom is good at advertising and talking, but there is no transfer of technologies from South Africa. There are no discernible research activities that they do here in Uganda. In fact, Eskom is a company that pushes the old equipment to produce electricity, buys a few items on international markets, but siphons off a lot from such meagre investments (Interview with Ugandan Parliamentarian, 3 September 2014).

However, there has been an active transfer of soft technologies in the form of staff training and development. Training sessions are usually facilitated by staff members from Eskom Enterprises and the main training sessions have been primarily concerned with SHE, which seems to be the companyôs top priority. Further training of personnel takes place in technical areas associated with electricity generation, and Eskom Uganda staff members sometimes have to travel to Eskom Enterprises in South Africa for such training. The company also pays for additional staff training in various areas at the Kafue Gorge Regional Training Centre in Zambia. An Eskom Uganda official stated:

> Training locals is a priority area for the company. Such training enables them to deliver efficiently. This enables us to meet our commitment to the government of Uganda and the consumers of the power we generate. Our staff members are exposed to South African training, as well as training from other regional training institutions, such as the one in Zambia. The company pays for all these trainings (Interview with Eskom Uganda Official, 3 September 2014).

Considering that Eskom Uganda employs about 115 staff members, of whom only 3 are expatriates, with 50% technical experts and 30% support staff or management personnel, it is contended that through training, which constitute the transfer of soft technologies, technology transfer between Eskom Enterprises and Eskom Uganda do take place. Thus, OFDI by Eskom Enterprises, rather than transferring hardware and embodied technologies, clearly transfers soft technologies in the form of tacit information and knowledge.

Nonetheless, even though the Eskom Uganda investment transfers soft technologies, does it transfer EST? The investment of Eskom Enterprises in Uganda is in the area of electricity generation through hydro-power, which can generally be considered a ócleanô energy source. But, although the plant may have some negative environmental impacts, it is not owned by

Eskom and, therefore, an analysis of the transfer of ESTs should focus primarily on Eskom Ugandaôs operations and its management of electricity generation activities. As noted earlier, Eskom Uganda has been able to replace obsolete and ageing equipment and components in its plants, thus bringing some efficiency to the production of electricity and, in a way, reduce negative impacts on the environment. However, since the hardware involved are mainly import-based, the OFDI of Eskom Enterprises cannot be fully considered as facilitating the transfer of environmentally sound technology (machinery or hardware) to Eskom Uganda in particular, and to Uganda in general.

ESTs are transferred in the form of tacit information and knowledge about the environment. Upon incorporation, Eskom Uganda Ltd fully implemented ôbest practicesô on safety and the environment, based on the parent companyôs systems. In this regard, Eskom Uganda applied a South African model for safety developed by the National Occupational Safety Association (NOSA), which is limited to only safety and the environment. Although limited in scope, the implementation of NOSA standards was a catalyst in the transfer of tacit knowledge, which assisted in mitigating the negative effects of the companyôs operations on the environment. The employment of NOSA standards necessitated the training of Ugandan staff members on the South African system and, thus, the transfer of knowledge and systems that are environmentally sound. An Eskom Uganda official commented:

> We started by sharing our knowledge on the environment and safety, using South African standards. We realised that for us to realise success, we needed to sensitise all employees, so that all our staff members, including Ugandans, are aware of the importance of safety, as well as the environment. This is an area in which we can claim success in terms of knowledge transfer. Staff members are putting into practice what they have learnt (Interview with Eskom Uganda Official, 3 September 2014).

In 2012, building on this experience and with headquarters support, Eskom Uganda Ltd attained ISO certification in three standards: ISO 9001:2004 in quality, ISO 14001:2008 on the environment, and OHSAS 14001:2008 in health and safety. Although much of the planning and implementation was done at the parent company level, the involvement of the subsidiary was necessary for certification to take place at the local level. Since Eskom Uganda Ltd is certified with ISO 14001:2008, which pertains to the environment, this means that an excellent and enhanced environmental management ethos and practices are in place. Therefore, OFDI through

Eskom Enterprises acted as a catalyst for obtaining international certification on the environment and, thus, facilitated the transfer of environmentally sound, disembodied technologies.

It is imperative to explore the linkages between Eskom Uganda and local industries in the country. The operations of Eskom Uganda are in a unique and specific area, which limits the firmôs interaction with many other domestic companies that are not operating in a similar arena. Regardless of this, interactions with local companies can take place through contracting some of them to act as suppliers of goods and services that relate to maintenance and operations of the hydro-power plants and electricity generation. However, this study could not obtain any information to confirm whether the interactions between Eskom Uganda and contracted local companies contributed to the building of capacities for domestic firms, and whether such interactions facilitated the transfer of ESTs.

## 6.7 CONCLUSION

This chapter has examined the influences of home countries on the content and character of outward FDI, specifically focusing on the transfer of ESTs to the host country. The chapter also focused on South Africaôs OFDI from the energy sector and the transfer of ESTs to other countries in general, and to Uganda in particular. It alluded to the fact that South Africa does not have an explicit national and sector-specific OFDI policy and direct institutions to facilitate OFDI. Therefore, the country does not exercise sovereignty principles with regard to OFDI and, as such, it passively regulates energy sector OFDI. It has highlighted government-imposed distortions on the market with regard to OFDI through an explanation of foreign exchange regimes, taxes, and policies that focus on Africa. The chapter has also analysed the mechanisms for co-ordination and synergy-building, and demonstrated that these are not that well-established.

The overall picture that the chapter paints is that South Africa has little involvement in OFDI. Hence, South African TNCs engaged in direct investments abroad do so with very little state support, if any. Based on this, an examination of the transfer of technologies, including ESTs, has focused on the role of individual TNCs rather than the state. In this regard, the chapter highlighted that first, most energy sector South African TNCs have invested in ódirtyô industries and, therefore, their effect in terms of the transfer of ESTs is minimal; and second, energy sector TNCs that have invested in renewables lack the technological capabilities to produce ESTs in the form of machinery and hardware and are dependent on imports, and only then channel the

imported technologies to host countries. Two key conclusions can be reached, based on these findings. First, South African energy sector TNCs generally transfer technologies to host countries, which does not necessarily mean they transfer ESTs. Second, instead of South African energy sector TNCs themselves being transferors of ESTs in the form of hardware and machinery, they serve as conduits through which ESTs are channelled to other African countries from countries with the requisite technological capabilities.

But, the Eskom Uganda Ltd case study has highlighted that South Africaôs energy sector OFDI has the potential to transfer, and has indeed transferred, ESTs in the form of knowledge and information, leading to the subsidiary firms achieving international environmental standards certification, or enhancing their ability to manage SHE.

The next chapter will take a comparative look at the findings of the two case studies on Angola and South Africa, respectively, and based on this analysis it will set out implications for policy-making and implementation.

# CHAPTER 7: DISCUSSION

## 7.1 INTRODUCTION

The previous chapter presented empirical evidence on South Africaôs energy sector OFDI and the transfer of ESTs. It has indicated that South Africa passively regulates OFDI and, hence, the state does not influence or shape OFDI and the transfer of ESTs by South African energy sector TNCs. Thus, the transfer of ESTs is totally dependent on individual policies at the firm or company level. As a result, there have been an insignificant transfers of ESTs to host countries.

This chapter will discuss, based on empirical data provided in Chapters 5 and 6, whether South Africaôs energy sector OFDI, and FDI inflows to Angolaôs energy sector, do indeed transfer ESTs. It will firstly, based on the SCIGID framework, offer a comparative discussion on the differences between Angola and South Africa in exercising sovereignty principles at the domestic level, as well as in the international arena. Secondly, it will discuss the exercise and imposition of distortions on markets by the governments of both countries. Thirdly, it will provide an in-depth discussion on the use of structural power, debate whether FDI transfers ESTs (utilising the empirical evidence presented in Chapters 5 and 6) and, specifically, draw attention to whether state involvement is important for the transfer of ESTs. And finally, it will set out the implications for policy-making and implementation.

But first, a comparative, general recapitulation of the issues that have thus far emerged in the course of this study, premised on the SCIGID framework, will be presented.

## 7.2 COMPARATIVE REFLECTIONS BASED ON THE SCIGID FRAMEWORK

### 7.2.1 The Exercise of Sovereignty Principles

The two case studies on Angola and South Africa, respectively, have demonstrated some differences with regard to the exercise of the sovereignty principles of autonomy, control, and international legal recognition, manifesting in the policy frameworks and institutional structures these countries have introduced to regulate and promote FDI. Whereas the Angolan case study, focusing on IFDI to the energy sector, has clearly demonstrated that the government actively

regulates and promotes IFDI through a set of explicit policy frameworks and institutional structures established at the national, sector and firm levels, the South African case study, focusing on OFDI from the energy sector, has shown that the government has mainly devised implicit policy frameworks and created indirect institutional structures for OFDI.

Furthermore, the two case studies also present contrasting positions on the exercise of sovereignty principles relating to the harnessing, domestication and harmonising of domestic policies and institutions with international regimes. As such, whilst the Angolan case study has shown a country that is constrained by internal capabilities and capacities but has attempted to explicitly harness and domesticate international regimes for IFDI and the transfer of ESTs, the South African case study has shown a country that has not, in any way, attempted to create synergies between national policies and institutions, or harness and domesticate international regimes for the purposes of OFDI.

However, the two countries have shown some similarities as far as policies and institutions for FDI flows are concerned. Whilst the Angolan case study demonstrated some implicit policies and indirect institutions with an effect on IFDI to the energy sector, specifically, the South African case study has revealed an extensive use of implicit policies and indirect institutions to regulate and promote OFDI, in general. On the one hand, Angolaôs use of a few implicit policies and indirect institutions mixed with extensive explicit and direct institutions, demonstrates a country with a robust IFDI policy framework and institutional structures while, on the other hand, South Africaôs contrasting and extensive use of implicit policies and indirect institutions, and no explicit policies and direct institutions, shows a country with weak OFDI policy frameworks and institutional structures. Furthermore, whereas Angola has domesticated and harnessed some international regimes that benefit the countryôs energy sector through the promotion and stimulation of IFDI, South African energy sector TNCs has to interact on an individual basis with international voluntary, regulatory institutions without any state support in order to promote OFDI on their own.

There are two important points to make in regard to the above differences in the exercise of sovereignty principles by Angola and South Africa. First, whereas Angola can be viewed as a country where the state actively regulates and promotes IFDI, South Africa can be regarded as a country where the state only passively regulates OFDI. Second, whilst the Angolan state is omnipresent at the domestic and international levels through policy-making and institutional

development actions, as well as harmonising domestic and international regimes, the South African state is almost totally absent as far as these matters are concerned, leaving TNCs with little choice but to deal with issues of OFDI on their own.

### 7.2.2 Government-Imposed Distortions

The two case studies have also demonstrated a few similarities and differences in the imposition of inducements and distortions by the government. To be sure, both countries have imposed some distortions on the market, especially through incentives and direct government interventions that have an effect on FDI flows. However, whilst Angola has imposed distortions that clearly focus on the energy sector, the distortions enforced by South Africa are not focused on the energy sector specifically, but are rather general and only indirectly affect energy sector TNCs and OFDI. Angolan government-imposed distortions on the market are mainly in the form of a combination of sector-specific, legal interventions through local content and participation laws that make the involvement of SOEs mandatory, as well as incentives that at times waive the provisions enshrined in local content laws. South African government-imposed distortions are in the form of policies on taxes, such as DTAs, as well as government policies that mostly favour investments into Africa rather than into the rest of the world.

Noteworthy is that similarities and differences in government-imposed distortions on the market in both case studies bring to the fore two important points. First, whereas direct sector-specific interventions by Angola result in much more visible outcomes at the national, sector and firm levels, the generalised policy interventions by South Africa have a number of indirect outcomes at the domestic level, especially as far as the energy sector is concerned. Second, direct government-imposed distortions on the market in Angola directly and openly condition FDI flows, contrasting sharply with the situation in South Africa insofar as it relates to OFDI.

### 7.2.3 The Use of Structural Power

There is a stark contract in the use of structural power by Angola and South Africa in order to direct FDI flows. Whereas Angola vigorously use structural power to co-ordinate various actors at the domestic level and build synergies among government departments to direct IFDI into the energy sector, there is no evidence at all to indicate that South Africa uses structural power to direct energy sector OFDI. In fact, the use of structural power in Angola seems to be similar to

that in Rwanda and Côte dôIvoire, drawn attention to in Chapter 4, where powers of co-ordination are placed in the institutions wielding the highest authority. In the case of Angola, the Presidency is central in co-ordinating IFDI to the country, as well as to the energy sector. This contrasts sharply with South Africa, where there is only anecdotal evidence of the involvement of the Presidency in OFDI through foreign state visits and trade exhibitions, which may then indirectly affect energy sector OFDI. Moreover, whilst the National Assembly of Angola has been an important institution for harmonising national energy sector-specific and national IFDI policies with international regimes, the South African Parliament has not featured at all as far as OFDI, in general, and OFDI from the countryôs energy sector, in particular, is concerned.

## 7.3. A COMPARATIVE REFLECTION ON HOW STATES DIRECT FDI FLOWS

### 7.3.1 A Reflection on the Empirical Evidence

Another comparison that has to be made, based on the empirical evidence presented in Chapters 5 and 6, is on the role of states in directing energy sector FDI flows. As explained in Chapter 3, for the state to be considered as directing FDI flows it has to (1) exercise sovereignty principles, (2) impose some distortions on the market that affect FDI, (3) utilise structural power to co-ordinate various actors and build synergies between them, and (4) harmonise domestic institutional structures with international regimes.

The situation in Angola has been in sharp contrast to that prevailing in South Africa. South Africa implicitly regulates and directs the general flow of OFDI through foreign exchange policies and the ógateway to Africa and Other Reforms Initiativeô and does not control or direct sector-specific OFDI. Institutions for directing energy sector OFDI are non-existent, although TISA and DIRCO attempt to play such a role by generally guiding national OFDI. The South African situation differs from that of Angola which has a plethora of national, as well as energy sector-specific regulations that direct FDI towards desired national and sector-specific goals. In terms of institutions, Chapter 5 has revealed that Angola directs IFDI to the energy sector through the actions of the Presidency, the Council of Ministers, the *ad hoc* Cabinet Committee, ANIP, MINPET, and SOEs such as Sonangol, ENE, EDEL and GAMEK.

Thus, the South African case has demonstrated that without the home country taking a central role in directing OFDI flows to particular sectors in a host country, TNCs are left on their own

to direct such flows and become dependent on host-country policies and institutions. On the contrary, when TNCs become the central actors directing FDI flows, as exemplified in the South African case, there is no focus on matters of co-ordination, synergy-building, and harmonisation in which the state should play a central role. In contrast, the Angolan case demonstrates that when host countries actively direct IFDI flows, TNCs play a secondary role in determining and directing such flows. When states do direct FDI flows, they also attempt to create some sanity amongst actors involved in such flows at the domestic and international levels.

### 7.3.2 Accounting for the Differences in How States Direct FDI Flows

The discussion so far clearly indicates several differences and a few similarities in the way South Africa has directed energy sector OFDI and Angola has directed energy sector IFDI. The key question is: How do these differences come about? This is a quite difficult question to answer and one explanation may lie in the regulatory capacities and capabilities of the state. However, this is not an entirely satisfactory answer as both Angola and South Africa have capabilities to generate and enforce rules and regulations beneficial to their economic growth and development.

As explanations revolving around the regulatory capacities and capabilities of the state are apparently untenable, it is believed that the answer to the question posed should be found in the direction in which FDI flows, and the stateôs perception of the value and benefits that such FDI flows bring to the state. The case of Angola, which shows a state that actively regulates and directs IFDI, is not unique among African countries. In fact, Chapter 4 has provided several examples that show that a number of African countries also actively direct IFDI towards economic change. Similarly, as indicated in Chapter 4, the case of South Africa, which passively regulates and does not direct OFDI, is in line with the approach adopted by some African countries. Conversely, even a general scan of South Africaôs IFDI policies would show that the country actively regulates and directs such flows.

This means that the answer to question posed above seems to be premised on the direction of FDI flows: whether they are inward or outward, and the perception of associated benefits from such flows. Within this argument, there are two reasons that attempt to account for these differences. First, African countries, with the exception of South Africa, are not really major OFDI-carrying states; hence, they have no compelling reason to direct insignificant OFDI flows. Then again, not even South Africa, which is the top OFDI-carrying country in Africa, has

regulated such flows. Second, African countries have a tendency to place the role of IFDI in economic development on a pedestal, in the process completely overlooking the very important role that OFDI might play. However, such practices are not informed by evidence; in fact, both IFDI and OFDI flows may provide several economic benefits for African countries. Whilst this study has dwelt more on the benefits of IFDI, it is important to point out that OFDI may facilitate greater revenues and profitability for TNCs and, consequently, taxes for governments, as well as stimulating a competitive spirit amongst TNCs, increasing exports, and creating employment. Hence, promoting and facilitating OFDI flows, as well as directing them, should be seriously considered.

## 7.4. FDI FLOWS AND THE TRANSFER OF ESTs

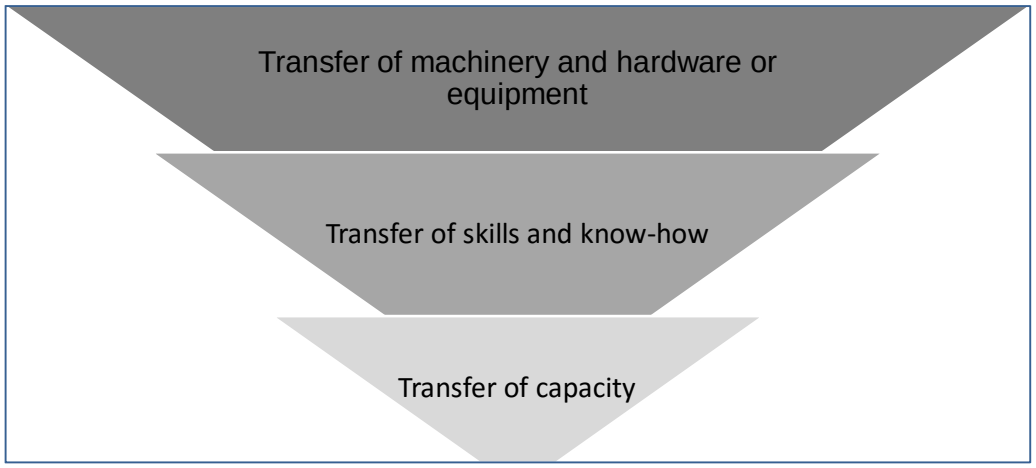
### 7.4.1 FDI and Transfer Technologies in General

In Chapter 1, a subtle question was asked whether, in the African context, FDI generally transfers technologies and its elements or components. Actually, the empirical evidence presented in Chapters 5 and 6 has clearly shown that FDI transfers technologies to African countries, and that a hierarchy can be developed, based on which technologies are transferred more than the others, as indicated in Figure 12, where the top inverted triangle shows the most-transferred technologies and the bottom one the least-transferred. From the two country case studies, it is quite clear that the transfer of technologies is considered and mainly occurs through the transfer of machinery and hardware (equipment). The transfer of machinery or hardware fits into Bellôs (1990) Flow A, as well as into Mansfieldôs (1982) material transfer classification, as explained in Chapter 1.

The Angola energy sector and firm-level case studies has demonstrated the transfer of machinery and hardware into the country through IFDI, as exemplified by the Biocom Project, the Angola LNG Project, and the Chikapa 1 Hydro-Power Project. Also, the equipment transferred through IFDI into Angolaôs energy sector has mainly gone into greenfield projects. The South African case study has shown the centrality of Eskom Enterprises in transferring new technologies in the form of spare parts and components to replace the old and antiquated power-generating machinery and hardware in Uganda. Thus, the two case studies have demonstrated that technology transfer in Africa through FDI may generally be associated with the transfer of hardware and machinery (equipment). The inclination to view technology transfer along these lines is, naturally, more pronounced in greenfield projects, where the projectôs very existence

and production activities are crucially dependent on such transfers. However, even in brownfield projects, the transfer of essential components and spare parts remains central to the production process, as shown by the Eskom Enterprises case study.

**Figure 12: Top to Bottom Hierarchy of Technologies Transferred through FDI**




*Source*: Author (2014)

The second aspect in the hierarchy is the transfer of skills and know-how for production through training and operational manuals. This falls under Bellôs (1990) Flow B category and Mansfieldôs (1982) design transfer classification, where they also distinguish between paper-embodied and people-embodied technologies. The two case studies mainly indicate the transfer of people-embodied technologies, rather than paper-embodied technologies, the former hinging on the transfer of skills through training.

The Angolan energy sector and firm-level case studies has revealed that skills-transfer through training is enshrined in the national IFDI policy framework, specifically articulated in the policy on Angolanisation. However, the implementation of the Angolanisation policy is not particularly rigid and the energy-sector case study has shown that the policy has been waived for greenfield operations. For example, the country waived the Angolanisation policy when implementing the Angola LNG Project, as well as the Biocom and Chikapa 1 hydro-power projects, especially the policy provisions on percentages of local against foreign employees, which have direct impacts on on-the-job training and the transfer of skills. But in some cases, the training of locals has to be undertaken by TNCs as a precondition for project approval, as well as accessing certain investment incentives. As Chapter 5 has drawn attention to, projects that create over 500 jobs

have access to particular incentives and such government-offered inducements are central to the transfer of skills to Angolans.

In contrast to Angola, the South Africa case study has shown that the transfer of technologies mirrored in skills-transfer is not enshrined in any national or sector-specific policies for OFDI, but is dependent on the decision of individual investing TNCs and host-country policies. Regardless of this, it has been demonstrated that Eskom Enterprises has mainly transferred skills to Eskom Uganda through in-house training conducted in Uganda and South Africa, as well as staff training performed in Zambia.

Despite the differences highlighted, the two country case studies have shown that training may either take place in-house or externally, especially in association with other training and technical institutions. Thus, successful skills-transfer through training is premised on the availability of a well-established educational and vocational skills infrastructure in both the host and home countries, as well as the capacities of investors to network with other institutions that may offer relevant training courses. In fact, this is in line with other studies that have noted that an educated workforce, or the quality of a countryôs education infrastructure, is an important determinant in FDI (Ajayi 2006; Asiedu 2002, 2006).

The transfer of know-how depends on education systems which build literacy and numeracy and the provision of operating manuals and standard operating procedures related to production processes. In contexts where locals are highly educated, FDI projects may easily transfer know-how as the people involved are able to read and comprehend the manuals associated with production processes and systems. But in situations where there are low levels of literacy, FDI would have to adapt and use other training methods to ensure that local staff members are familiar with the manuals and other procedures. The Angolan case study has shown that the transfer of know-how during the period prior to 2004 was limited and rather difficult as investments in education were low and the country was embroiled in a civil war. The post-2004 period saw increased investments in education which, concurrently, had a positive impact on the transfer of know-how. But still, the language barrier poses some limitations on the transfer of know-how as Angola remains a Portuguese-speaking country. In this regard, whilst Brazil and Portugal can easily transfer know-how into Angola, other investors, such us the US, the UK and China, still face some difficulties related to language.

Even though the two case studies have underscored that skills-transfer occurs through training, they have also demonstrated that there is a problem in trying to transfer managerial skills to locals, because this is not only a matter of training but also includes mentoring and coaching. Mentoring and coaching skills are not easily available in many companies, and very few institutions in developing countries have any capacity to provide such skills. And so, the Angolan and South African case studies have confirmed that there is a bottleneck in the transfer of high-level managerial skills. Thus, FDI generally provides for the transfer of general skills that allow locals to occupy lower and middle-level posts. On the other hand, it demands considerable planning and effort to transfer higher-level skills to locals, preparing them for managerial positions. Even in cases where national, sector-specific and firm-level policies exist, such as in Angola, as long as such policies do not clearly stipulate the transfer of managerial skills, as well as build the necessary supporting infrastructure, the objectives of these policies will not be realised.

From the empirical evidence provided in both case studies, it can be stated that the transfer of skills and know-how affects all types of FDI, including those related to greenfield and brownfield operations. However, in cases where a greenfield project is novel and unique, as in the case of the Angola LNG Project, there is need to invest in generating a critical mass of skills, either before production commences or concurrently with its operationalisation. This may sometimes differ from brownfield investments where skills and know-how may already exist within the host country, such as in the case of Eskom Uganda where training had been aimed at upgrading existing skills so as to improve on labour efficiency and productivity.

The third tier, which is the lesser one in the hierarchy of general technologies transferred through FDI, is capacity transfer, which relates to Flow C in Bellôs (1990) category and Mansfieldôs (1982) classification. This involves the transfer of technologies with higher-level complex skills, expertise, and know-how. These sets of skills involve a mastering of the systems and processes associated with a particular project and also the ability to design, effect changes (adapt, modify), and integrate systems into a functioning unit. The two firm-level case studies do not show evidence of the transfer of such complex sets of technologies. The case studies, rather, show a systematic parachuting in of the requisite skills from home countries, without creating linkages that may assist in building such skills in the host countries. For example, in the Angola LNG Project, Bechtel and ConocoPhillips retained these skills and have not established joint ventures or partnerships with local companies which could lead to capacity transfers. Likewise, Eskom

Enterprises became capable of running power-generation plants and, when needed, experts are flown from South Africa to Uganda, in the process limiting capacity transfers.

So, the two case studies have demonstrated that whether FDI is directed by the state or just indirectly influenced by it, it may generally contribute to the transfer of specific technological components or elements. Some technologies are key to the very existence of FDI projects, while other technologies improve on the efficiency of production. However, the empirical evidence shows that the involvement of the state seems to be an important determinant in ensuring the success of technologies transferred, as there are infrastructural aspects, such as education systems, that TNCs are not in a position to address.

### 7.4.2 FDI and the Transfer of ESTs

The key finding presented in Chapter 5 is that the involvement of the state is imperative in stimulating and facilitating the transfer of ESTs through FDI. The Angolan case study has demonstrated the necessity of explicit policies and direct institutions to promote FDI, as well as clear incentive policies that stipulate the desired types of technologies to be transferred. In other words, the incentive policy in Angola makes it quite clear that inducements will only be offered to direct investors who transfer technologies to local companies, and further emphasises the fact that the types of technologies transferred are crucially important in determining whether incentives will actually be awarded. This conditionality as far as inducements are concerned, clearly places the responsibility on direct investors to evaluate their technologies before transferring them. By type of technology, the incentive policy provides some leeway in evaluating whether a TNC is transferring ESTs or general technologies. Thus, TNCs have to justify the types of technologies they would like to transfer in order to qualify for incentives. For this reason, it is asserted that state involvement in Angola has indeed directed FDI to the transfer of ESTs in the energy sector, especially through the Angola LNG Project.

This Angolan scenario, where explicit incentive policies are tied to types of technologies transferred, differs from that prevailing in South Africa (as presented in Chapter 6), where there are no explicit or implicit policies and direct or indirect institutions that stipulate that OFDI should transfer ESTs. Chapter 6 has shown that in such a situation, the transfer of ESTs is left to TNCs and host countries to decide. But, in the case of Eskom Uganda, no resolute and deliberate efforts have been made to transfer ESTs. Therefore, it can be argued that such transfers, mainly

in the form of good environmental management practices, have been purely accidental and coincidental.

Another point that arises from the two case studies is that, when considering whether FDI has transferred ESTs or not, it should take into account where the FDI-carrying investment has gone. This means firstly, analysing whether the FDI has gone into greenfield or brownfield operations, and secondly, whether the types of technologies transferred are new or antiquated, in particular relating to machinery and hardware. The findings from this study is that there is a perception that technologies transferred through greenfield investments, as is happening in Angolaôs energy sector, are much more environmentally sound, because they transfer new machinery and hardware which is more efficient and less-polluting than investments that go into brownfield operations, such as is the case in Uganda. These sentiments are in line with Gallagher and Zarskyôs (2008: 4) analysis (explicated in Chapter 2) that FDI into greenfield operations may be a vehicle for the transfer of cleaner technologies. In this regards, expectations are that the Angola LNG Project plant could be less-polluting, as all components used in the plant are new. This contrasts sharply with expectations regarding Eskom Ugandaôs operations, as they essentially require the replacement of old spare parts in antiquated machinery.

However, there is also a contrasting viewpoint that argues that it is not essential whether hardware or machinery is antiquated or new, or whether the project is brownfield or greenfield, but what matters is where the technologies are applied. This line of thought regard old or new technologies that go into oil-exploration as considerably less environmentally sound, compared to those that go into wind and solar power-generation. In this regard, these views would indicate that although the Angola LNG Project is much cleaner than gas-flaring, it still has some polluting elements attached to it; hence, it should not qualify as a project where ESTs are fully transferred. This line of argument views the transfer of technologies to Eskom Uganda as much more environmentally sound, as hydro-power is a much cleaner energy source.

Another perspective in the analysis of the transfer of ESTs emphasises the transfer of capacity and skills. Indeed, capacity-transfer is key to the mastery of transferred ESTs by recipients, as they adapt them to local conditions and modify them further so that they become even more environmentally sound. This argument is in line with the ópollution-halosô explanation provided by Gallagher and Zarsky (2008: 4), expounded on in Chapter 2.

All these different arguments illustrate the importance of holistically analysing all the processes and systems associated with a project rather than focusing on a single aspect, before passing judgement on its environmental soundness. As argued in Chapter 5, it is important to analyse agricultural practices just as it is important to analyse the related bio-energy project, and then holistically judge whether all the systems are environmentally sound. Similarly, Chapter 6 subtly points out the importance of considering the interaction of water sources with the environment before passing judgement on the environmental soundness of hydro-power projects. This shows that judging the transfer of ESTs is a fairly complex task. From the optical foci of Gallagher and Zarsky (2008: 4) it can be stated that the two case studies demonstrate an inclination to transfer clean technologies, but do not provide evidence for leapfrogging and also very little proof for pollution halos.

Although FDI generally transfers technologies, the transfer of ESTs is a difficult and more complex affair and evidence proves that the involvement of the state is of paramount importance, for a number of reasons. First, explicitness by the state on the desired types of technologies to be utilised in investment projects, as well as on incentive policies and direct institutions to implement such policies (as demonstrated by the Angola energy sector and firm-level case studies), directs FDI to the transfer ESTs. Without explicit policies and direct institutions, as shown in the South African energy sector and firm-level case study, the transfer of ESTs is left to TNCs, who would generally only transfer technologies enabling them to realise a return on investments without due regard to environmental protection or management issues.

Second, as indicated by the Angolan case study, there are certain international regimes that may be harnessed by states in support of the transfer of ESTs, through the creation of a designated national authority (DNA) and in line with UNFCCC requirements. It clearly points out that the Angolan DNA does actually facilitate the transfer of ESTs, particularly through the Angola LNG Project (presented at COP13 in Bali, Indonesia). However, TNCs may choose not to interact with these inter-state international regimes, but rather network with international voluntary regulatory regimes. Therefore, without the interaction of states with international regimes, creating conducive contexts and conditions for non-state actors to operate in, the transfer of ESTs by TNCs would always remain a mammoth task.

Third, there is a multiplicity of actors involved in shaping FDI, including state and non-state actors and at various levels of interaction. In order to create some sanity and order, an actor with

the wherewithal and capacity to interact with multiple actors at different levels is, therefore, necessary. Hence, the transfer of ESTs through FDI demands the capability to negotiate the terrain that contains many contesting actors and many conflicting interests. The transfer of ESTs through FDI is a rather complex process, with varied policies and institutions that have to be consulted and bargained with. The only available, credible authority that since times immemorial can navigate such contested waters has been the state. Thus, the capacity of recipient host countries to negotiate and bargain for FDI may determine whether such an investment does indeed transfer ESTs. Similarly, the ability of the home country to adhere to international obligations and interact positively with private-sector entities may facilitate the transfer of ESTs through FDI.

Fourth, the case studies have demonstrated that technologies, including ESTs, are available on the international market. This is clear in the case of Angola, where it managed to procure LNG technology on the international market, as well as in the case of South Africa, where hydro-power components could similarly be acquired. Hence, if technologies are available on the market, what is essential for project owners is to go through a process of technology óprospectingô, and to decide on the benefits of technology transfer through FDI rather than through other channels. The availability of a variety of technologies on the international market would mean that, without state intervention through the directing of FDI, TNCs would have options on the types of technologies they would like to choose from. Traditionally, TNCs would choose technologies based on what makes business sense, rather than what would be good for the environment. So, it is the involvement of the state through policies directing FDI that will shepherd TNCs towards technologies that are both business sensible and environmentally sound.

Finally, the evidence provided has proven that the technological capabilities of home countries are a determining factor in the ability of FDI to transfer ESTs. The two case studies demonstrate that home-country firms that have some technological capabilities can easily transfer such technologies internally to their subsidiaries, as shown in the case of Angola. In the South African case study, the lack of in-house technological capabilities acts as a limitation on the ability of the home country to transfer ESTs to Uganda. Hence, South Africa has to procure technologies from countries with manufacturing capabilities and then channel these to Uganda. The South African case also demonstrates the situation in which many emerging and developing countries find themselves, that they simply have no capacity to manufacture machinery and other hardware or components. Instead of these countries and their firms being the direct transferors of

technologies, they primarily serve as conduits or gateways through which procured technologies are channelled to other developing countries. So, unless there are specific legal or policy requirements imposed on the countries lacking technological capabilities to transfer ESTs, they will simply transfer what is available or procure general technologies on the open market.

## 7.4 IMPLICATIONS FOR POLICY-MAKING AND IMPLEMENTATION

### 7.4.1 Implications for the State

The study has underscored the central role of the state in facilitating the transfer of ESTs through FDI. This implies that the state must have the capability to exercise sovereignty principles through policy-making and institution-building at the domestic level. The state must also be able to impose some market distortions and offer certain inducements which would shape the flows, quality, and types of FDI. Putting the state at the centre of FDI and the transfer of ESTs implies that the state must have the ability to efficiently and effectively deploy structural power to devise coherent FDI policies and establish synergised institutions. And the state must be able to influence domestic actors at various levels, such as at the national, sector and firm levels.

The study has also demonstrated the important role of the state as a go-between, co-ordinator and even arbiter between domestic policies and institutions and international regimes, facilitating the transfer of ESTs through FDI. This has several policy implications. First, the state should have an appreciation for the interests of domestic actors, as well as other states or TNCs involved in FDI. Second, the state should create clear procedures for domestic actors to raise their concerns and interests, and to deal with them appropriately. This may include the necessity for the state to impose various distortions on the market. Third, the state should also have a clear procedure on how international and regional regimes may be harnessed and domesticated. This entails that the state should have capacities to analyse and evaluate the costs and benefits that may arise from a particular investment regime or a technology-transfer regime. The state should also provide some inputs during regime-creation and modification that would ensure that wider development aspirations are catered for and that technologies, such as ESTs, are transferred through FDI. Finally, the state should facilitate the harmonisation of domestic policies and institutions with international regimes.

Therefore, the centrality of the state in ensuring FDI-carrying ESTs means that the state has to have various capacities and capabilities that enable it to fashion policies and institutions at the domestic level, and also create beneficial interactions at the international level. Thus, the state should be able to deal with various actors at different levels without losing sight of key national interests.

### 7.4.2 Implications for FDI and FDI Policy

The study draws attention to a number of issues with implications for FDI and FDI policy. For countries to facilitate and promote the transfer of ESTs through FDI there is a need to widen the current scope and understanding of FDI from a rather narrow focus on volumes, to also include the type, the content and the quality of FDI. This has several policy implications. First, it calls for the accurate recording of FDI volumes, whether IFDI or OFDI, as it assists in the analysis of trends and also provides an indication of the sectoral allocation of FDI flows. Currently, whilst national data on FDI is readily available through the national banking system and UNCTAD, there is a paucity of FDI data at the sectoral level. This situation negatively impinges on the ability to determine and evaluate the sector-level effects of FDI. There is also a laxity in recording and analysing OFDI flows, which affects the understanding of the beneficial effects of, and the crafting of active policies associated with, such investments.

Second, the study also highlights the importance of being familiar with the different types of FDI. This calls for a rethinking of the current approach to policy and practice, whereby most African IPAs advertise for FDI without focusing on particular FDI types. Understanding the type of FDI would ensure the crafting of policies that would facilitate and promote the preferred type. Whether a country desires to attract more greenfield or brownfield investments should be deliberate, clear, policy-supported, and dependent on development imperatives. Thus, not all FDI types may necessarily be beneficial for the country. For example, whilst many African countries view FDI as a panacea for unemployment, some greenfield investments into mining and other extractive sectors do not utilise significant numbers of the abundant and available labour force as they depend on machinery (mechanisation) and other technologies to exploit natural resources. In this case, FDI may well be bringing in technologies that substitute labour. Similarly, efficiency-seeking brownfield investments may also lead to the restructuring and retrenchment of personnel.

Third, the study shows that being aware of the content of FDI is of great importance. Therefore, countries should be able to analyse the basic and essential elements that a proposed FDI project is composed of, as well as the technology transfers it might produce. In this regard, countries should appreciate that FDI is composed of a complex bundle of resources, and as each country and each context differs, the planning and realisation of benefits that might accrue also differ. Some elements embedded in FDI demand detailed planning as they cannot be easily transferred. For example, the study specifically highlights that the transfer of managerial skills that are rooted in FDI is quite complicated. Equally, it shows that the transfer of skills and know-how is not restricted to a particular project, but includes how the project interacts with educational and vocational training infrastructure external to that project.

Fourth, the quality of FDI is a determining factor in facilitating or promoting the transfer of ESTs through FDI. Hence, matters dealing with FDI quality should always be central in evaluating and accepting FDI. Countries should establish mechanisms to monitor and evaluate FDI quality at all times if they hope to realise the transfer of technologies, including ESTs through such an investment.

Finally and closely linked to the foregoing, the study alludes to the importance of creating monitoring and evaluating mechanisms for FDI policies and institutions, especially as they pertain to the transfer of ESTs. The devising of such mechanisms at the policy and institutional level is largely dependent on the development of a clear set of indicators. In most countries, the indicator sets and monitoring mechanisms that are available relates to FDI volumes, in particular reports that focus on monthly, quarterly and annual FDI flows and stocks. Furthermore, some reports that analyse FDI in relation to employment creation or employment expansion, or investment treaties signed, or investment policy changes are generated on an *ad hoc* basis. Besides these, there are many aspects of FDI that demand some indicators so that they can be monitored and evaluated. However, these have remained largely unmonitored. Thus, countries have to produce a clear set of FDI indicators that can be monitored over time. Countries would also need to evaluate the effects of FDI against such indicators, including transfer of technology-related indicator sets.

### 7.4.3 Implications for Technology Transfer, including the Transfer of ESTs

The study also raises a number of policy implications for technology transfer, including the transfer of ESTs. The key issue that arises from this study is that the transfer of technology is not generalised and similar across all technologies, but differs according to the peculiarity of the particular technology. Furthermore, the environmental impacts of technologies are dependent on their end-use, the processes and systems associated with deployment, and the environmental awareness of the technology manufacturer and technology acquirer.

Hence, if the objective of countries is to attract or transfer ESTs through FDI, policy considerations include an evaluation of whether the acquired technology is cleaner than existing technologies, and whether it reduces or abates pollution, thus creating pollution halos and leading to technology leapfrogging. The transfer of ESTs is not only an environmental issue, but should be considered within broader techno-economic systems. Thus, technology transfer, including ESTs, also has a bearing on the industrial policy of a country. So, countries have to analyse FDI in relation to the types of technologies they, or relevant sectors, would want to attract. An analysis of the technologies to be transferred should include an evaluation of the appropriateness of the technology in a given context, and the impact of the technology in the short, medium and long-term.

Technology transfer may be viewed as successful when domestic firms in host countries receive, adapt, utilise and even modify that technology. Thus, countries should establish mechanisms to ensure that TNCs interact positively with domestic firms. Local content laws encompassing, *inter alia*, local procurement and distribution, act as catalysts in this process. In addition, policies that encourage capacity-building programmes by TNCs assist with the facilitation, enhancement and nurturing of competencies within local firms.

### 7.4.4 Technological Capabilities and Capacity-Building

This study emphasises that the transfer of ESTs through FDI is largely dependent on the home countryôs technological capabilities. Home countries that are less-endowed with technological capabilities cannot, therefore, be active transferors of technologies, including ESTs. This implies that it is important for TNCs to possess internal technological capacities, and also to have the capabilities to transfer such capacities to host countries.

In addition, the study stresses that domestic firms in host FDI countries should participate directly in the production processes and other core activities of TNCs, rather than being involved in secondary activities such as the supply of catering services, footwear, and other non-production-related and operational activities. The interactions between domestic firms in host countries and TNCs should enable these countries to develop some absorptive capacities for FDI and technologies arising from direct investments.

Therefore, for FDI and the transfer of technologies, including ESTs, policies and institutions that build technological capabilities are of crucial importance. These policies may be linked to national industrial development policies, as well as national R&D policies. They may also include some incentives for TNCs to localise R&D activities. But in general, policies that facilitate and promote capacity-building in domestic firms for participation in the supply and distribution value chain of TNCs are essential.

## 7.5 CONCLUSION

This chapter has discussed the empirical evidence presented in Chapters 5 and 6, specifically focusing on how states stimulate and facilitate the transfer of ESTs through FDI. This sheds light on two important matters. First, FDI generally transfers technologies to African countries, especially in the form of machinery and hardware that may be seen as the lifeblood of the project. Second, unlike other general technologies, the transfer of ESTs through the medium of FDI is dependent on the intervention of the state. Whilst FDI may transfer technologies in general, for ESTs to be transferred a conscious, deliberate and active intervention by home and host states is of paramount importance. Whether FDI actually transfers ESTs depends on the structural power of the sovereign host state to actively direct FDI through explicit policy frameworks and direct institutional structures, as well as through incentives and international relations. Furthermore, the respect of a home country for international regimes as they relate to the transfer of ESTs, together with its inherent technological capabilities, plays an important part in stimulating the transfer of such technologies through FDI.

This chapter has also highlighted the policy-making and policy implementation implications of the studyôs findings. It has been noted that policy-making and policy implementation have not fully addressed issues relating to the stateôs central role in capacity-building in order to enhance

its capabilities to direct FDI through the transfer ESTs. Capacity-building should enable states to co-ordinate domestic policies and institutions, and also harness and domesticate international regimes. Furthermore, it has highlighted the need for creating mechanisms for the regular monitoring and evaluation of policies and institutions, as well as for technological capacity-building.

The next chapter will conclude this study. It will provide an overview of the research undertaken, present a summary of the research findings, explicate the challenges experienced in the course of the study, and make some recommendations for future research.

# CHAPTER 8: CONCLUSIONS

## 8.1 INTRODUCTION

As explained in the introductory chapter, this study set out to examine the nature of FDI policies and institutions that African countries, in particular Angola and South Africa, have put in place, and how such policies are directing FDI to stimulate and promote the transfer of ESTs. In concluding the study, this chapter will summarise the key findings and arguments from previous chapters, link the initial research assumptions of the study with the actual findings, make some policy suggestions, then reflect on challenges experienced during the course of the study, and finally proffer some recommendations for a future research agenda on the general theme of this study and associated issue areas.

## 8.2 OVERVIEW OF THE RESEARCH

This study revolved around an analysis of the transfer of ESTs through FDI in the context of Africa in general, and Angola and South Africa in particular. The essence of the study was to understand the factors associated with the transfer of ESTs through FDI, considering that ESTs display three characteristics that make them different from other general technologies: (1) they are specifically developed to mitigate the negative environmental effects arising from production, (2) their transfers are enshrined in international regimes, and (3) they are central to the sustainable development programmes of many countries. Although FDI has generally been considered a vehicle for transferring technologies, evidence on whether and how it transfers ESTs in the African context is seriously lacking.

In examining the subject matter under research, Chapter 1 provided the background to the study, underscored the studyôs objectives, and presented a number of reasons justifying the study. These reasons are: (1) to demonstrate that FDI is indeed a vehicle for the transfer of ESTs in Africa; (2) to develop a clear conceptual framework that would assist in analysing the subject matter; (3) to explain the role of the state in the transfer of ESTs through FDI; (4) to show that FDI and the transfer of ESTs can be governed by existing national policy frameworks and international regimes; and (5) to stimulate new interdisciplinary research in the area of FDI and the transfer of ESTs.

The chapter elaborated on the qualitative, multiple-embedded case-study methodology utilised for this study, including a triangulation of a variety of data gathered from primary and secondary data sources, as well as 107 interviews conducted with officials from government, NGOs, inter-governmental organisations, private sector companies, and case-study firms. Justification for the selection of Angola and South Africa as case studies was also provided: (1) Angola is among the top African countries that receive IFDI, and South Africa is the top African country involved in OFDI; (2) both countries use a regulatory approach to FDI; (3) the researcher has stayed in both countries, hence established useful contacts which assisted him in data-collection and analysis; and (4) the researcherôs mastery of the Portuguese and English languages was essential in conducting this research. In amplification of the methodology, purposeful sampling procedure, data-collection processes, as well as data-collection tools and data-processing were addressed. The studyôs limitations were briefly raised, especially the fact that it did not utilise non-probability sampling, limiting the generalisations that could be made from the findings.

The studyôs major contributions were also underscored as (1) enlarging the body of knowledge on FDI and the transfer of ESTs in general, and in Africa in particular; (2) generating a new body of knowledge by developing a new interdisciplinary conceptual framework that may guide the analysis of the transfer of ESTs through FDI; (3) presenting crucial empirical evidence and data for African policy-makers and negotiators for use at both domestic and international levels; (4) explaining, through an interdisciplinary conceptual framework, the nature and content of FDI which may assist policy-makers and practitioners in eschewing reductionist approaches; and (5) moving beyond North-South discourses, prevalent in the current literature, and proffering a more holistic perspective.

Chapter 2 presented a review of the available literature. It critically examined the existing literature, especially the absence of a distinct connection between FDI and the transfer of ESTs, focusing on the roles of the state and institutions. The literature-review exercise attempted to locate this study within the available source material and drew attention to gaps in the literature, hence the need for utilising different methodologies and approaches, as well as constructing a conceptual framework for the exploration of the studyôs subject matter.

A conceptual framework for the study was developed in Chapter 3. It commenced with an examination of theories underpinning the economics and IR disciplines, specifically the IPE sub-

discipline, which are the building blocks of this study. From IPE, the state-centred approach was adopted, whereas from economics, the government-imposed-distortions theory was selected. This approach and theory were then combined with the institutional theories of IPE and economics to construct a new interdisciplinary conceptual framework, the state-centred-institutional-government-imposed-distortions framework (SCIGID). This framework provides for an analysis of the state as the central actor in stimulating and facilitating FDI that transfers ESTs through the exercise of sovereignty principles, the imposition of market-distortions, and the deployment of structural power.

The SCIGID framework, explicated in Chapter 3, posits that the exercise of sovereignty principles by states leads to the crafting of policy frameworks and institutional structures for FDI domestically, thus at the firm, sector and national levels. At the international level, the exercise of sovereignty principles is evident through inter-state negotiations and bargain-striking, leading to the construction of international regimes that may assist in achieving some sanity in a largely anarchical world. The role of the state includes harnessing and domesticating international regimes, as well as harmonising domestic policies and institutions with such regimes. Moreover, the imposition of market-distortions and inducements in the form of barriers and incentives, conditions the flow and types of FDI. Distortions can either direct FDI to flow into specific sectors, thus stimulating and facilitating the transfer of technologies, or dissuade FDI from flowing into certain sectors, hence discouraging the transfer of particular technologies. The use of structural power constructs mechanisms for the co-ordination of state and non-state actors, and enables synergies to be built between relevant state entities. In its operational form, the key pillars of this conceptual framework are the state, FDI, direct and indirect institutions and policies, technological capabilities, nested policies and institutions, and international regimes.

The focus of Chapter 4 was on how African states direct FDI towards economic change and development. It started off by explaining the meaning of the wider notion of economic change, which covers socio-economic growth and environmental issues, and indicated the trends in IFDI to Africa. It also provided examples demonstrating how African states have exercised sovereignty principles, specifically pointing out their central role in shaping the policies and institutions that regulate FDI, engaging in inter-state negotiations, as well as participating in international regimes that deal with FDI and the transfer of ESTs. It drew attention to the fact that the policies that African states have introduced primarily deal with (1) the entry/establishment of investments, (2) the operational treatment of investments, (3) the

promotion/facilitation of investments, (4) the retention and repatriation of investments, and (5) the creation of a conducive business climate. In addition, it stressed the widespread establishment of IPAs in Africa for promoting and facilitating FDI.

The chapter examined government-imposed distortions employed by African countries, specifically in the form of incentives for, and barriers to, FDI. It emphasised that African countries use taxes and direct intervention policies to regulate and guide the flows of FDI. It demonstrated the use of structural power by African states and pointed out that they have placed the co-ordination of actors involved in FDI within the purview of the highest offices wielding authority in government, namely those of the President or Prime Minister. Synergy-building amongst state entities is usually conducted at governmental level, either through a Council of Ministers or, in other instances, through *ad hoc* Cabinet Committees on Investment. The chapter showed how African states direct FDI towards economic change through explicit investment and incentive policies, as well as through direct institutions to enforce such policies. It also established that although African governments attempt to be omnipresent and tend to apply a regulatory approach to FDI, they have mainly focused on IFDI and not OFDI. Despite this, it clearly demonstrated the centrality of African states in directing FDI towards economic change and development.

Chapter 5 departed from the generic, Africa-wide approach of Chapter 4 to chart a specific course showing how Angola stimulates and facilitates the transfer of ESTs through energy sector IFDI. It analysed the exercise of sovereignty principles and underlined the pivotal role of the Angolan state in shaping national, sector and even firm-level FDI policies and institutions. Overall, it demonstrated that the involvement of the state has facilitated an evolving, yet explicit, national FDI legal, policy and institutional framework, displaying an increasing capacity to attract and promote FDI inflows to the energy sector. It was found that although national FDI policies and institutions are constrained by capacity challenges, they have attempted to domesticate and harness certain international regimes. Some state-imposed distortions on the market through the active participation of SOEs in energy sector FDI projects, the offering of incentives, as well as policies on the payment of foreign transactions and repatriation of profits were also elaborated on. The evidence on government-imposed distortions presented in this chapter showed that Angola has introduced explicit inducements to deal with certain types of technologies transferred through IFDI, giving the state powers to direct the transfer of ESTs.

It further explained how Angola employs structural power to co-ordinate various state and non-state actors, as well as build synergies between state institutions. The co-ordination of actors engaged in energy sector IFDI falls within the ambit of the Presidency, assisted by Sonangol, ANIP, MINPET, the Council of Ministers, as well as an *ad hoc* Cabinet Committee. Similarly, synergy-building between government institutions falls within the preserve of the Presidency, the Council of Ministers, ANIP, Sonangol, and the *Guiche Único de Empresa* (replacing MINPET and the *ad hoc* Cabinet Committee). Whilst the institutions and mechanisms for building synergies are in place, their effectiveness is questionable as exemplified by the lack of interaction between MINPET and the Ministry of Environment when implementing environmental policies, as well as delays in the registration of companies despite the existence of a one-stop facility for registration, namely the *Guiche Único de Empresa*, supposed to also contribute towards building synergies between all government actors.

The chapter also examined the transfer of general technologies to Angolaôs energy sector through IFDI. It was found that not all technology components are transferred. IFDI transfers technologies in the form of hardware and machinery (equipment), as well as people-embodied technologies in the form of skills gained through training. However, FDI inflows have experienced difficulties in transferring paper-embodied technologies, managerial skills, and óknow-whyô technologies. Moreover, the transfer of technologies through locating R&D facilities for the energy sector inside Angola has not materialised. The chapter explained that at sector level, local content laws and the policy of Angolanisation have been catalysts in building supply value chains between domestic and international firms. Even so, these supply chains have not been associated with core production activities, but have been restricted to providing secondary services only. Furthermore, the transfer of technologies through distribution chains has not happened, as all companies in this sub-sector are state-owned.

Chapter 5 further conducted an in-depth analysis into the transfer of ESTs to Angolaôs energy sector through IFDI. It revealed that significant volumes of IFDI to the energy sector are channelled into greenfield operations and the importation of new machinery and equipment with active participation from SOEs, hence resulting in the transfer of some ESTs. In addition, it also highlighted the fact that Angola incentivises TNCs, based on the types of technologies they bring into the country, and directing them towards the transfer of ESTs. Furthermore, in demonstrating how the country has directed energy sector IFDI to promote the transfer of ESTs, the chapter provided a firm-level case study of the Angola LNG Project, an environmentally sensitive FDI

project in the oil and gas sub-sector. The focus was on (1) the projectôs institutional evolution through IFDI, (2) national policies, laws and institutions facilitating its founding, (3) regional and international instruments that relate to its establishment, (4) the transfer of technologies, including ESTs, and (5) existing linkages between TNC-investors and domestic firms. Moreover, the chapter stressed that the way in which host countries exercise sovereignty principles, impose distortions and inducements on the market, and deploy structural power plays a crucial role in whether FDI transfers ESTs.

Chapter 6 was moulded along the same lines as Chapter 5, but it analysed the transfer of ESTs through FDI from the vantage point of the home country. As such, it scrutinised South Africaôs role in shaping national OFDI, as well as whether such investments facilitates the transfer of ESTs to host states. The chapter started off by examining how South Africa exercises sovereignty principles with regard to the transfer of ESTs to other countries through OFDI. It was found that the country has not openly exercised sovereignty principles, but created implicit and indirect institutions for OFDI. Furthermore, South Africa has not harnessed or domesticated international regimes to specifically benefit energy sector OFDI. Hence, energy sector OFDI merely coincidentally and accidentally benefits from the actions of the state in other areas.

A scrutiny of government-imposed distortions related to energy sector OFDI was also conducted, revealing the fact that South Africa has not instituted any direct energy sector incentives (inducements) or market-distortions to stimulate or facilitate the transfer of ESTs through OFDI but, nonetheless, has introduced some implicit and general national-level distortions, indirectly affecting or influencing energy sector OFDI. Such implicit national measures include the ôGateway to Africa and Other Reforms Initiativeõ, DTAs, as well as foreign exchange policies. The chapter further drew attention to the fact that there is no use of structural power by the state to co-ordinate and build synergies for energy sector-specific OFDI. It was pointed out, however, that there are some national institutions, such as the Presidency, DIRCO and TISA, whose actions may have indirect consequences for TNCs involved in direct investments abroad.

From the presented evidence on South Africaôs exercise of sovereignty principles, the imposition of market-distortions and absence of the use of structural power, the country had to be viewed as passively regulating OFDI and, therefore, that the government was only co-incidentally involved in energy sector outward FDI and the transfer of ESTs. Thus, a shift in analysis had to be made from the role of the state, to the role of TNCs in transferring technologies and ESTs to

host countries. At the sector level, it was revealed that (1) South Africaôs energy sector TNCs generally transfer hardware in the form of machinery and equipment in order to realise production, (2) that the lack of in-house manufacturing capacities compel South African TNCs to import technologies from elsewhere, and then merely act as conduits that deliver these to their final destinations, (3) and that host-country policies on FDI condition the types of technologies that TNCs have to transfer. However, whether the transfer of ESTs through South African energy sector TNCs takes place or does not happen at all is not that clear, since most of these firms have invested in dirty, extractive industries and do not manufacture ESTs themselves but have to acquire them on the open market. What was apparent, though, was that South African energy sector TNCs have developed certain soft technologies related to environmental management practices that may be transferred as ESTs to other African countries.

In order to provide more clarity on the transfer of ESTs through South Africaôs energy sector OFDI, a firm-level case study was conducted on Eskom Uganda Ltd. An analysis was made of its institutional evolution through FDI, the transfer of technologies including ESTs, and its interaction with domestic firms. Four key findings resulted from this. First, when home countries passively regulate OFDI, the onus to transfer technologies, including ESTs, rests wholly with the relevant TNCs and the host country. Second, when TNCs are left on their own to determine what types of technologies to transfer, evidence on the transfer of ESTs becomes unclear and rather mixed. Third, the transfer of technologies, including ESTs, in a situation where the home country passively shapes OFDI, depends heavily on host country policies, the market costs of technologies, as well as the in-house manufacturing capacities of TNCs. And finally, for home countries to stimulate and facilitate the transfer of ESTs, they have to respect and adhere to international obligations that stipulate the necessity for, and importance of, such transfers.

Chapter 7 was a discussion on the empirical data generated in Chapters 5 and 6. The chapter commenced by comparatively analysing the exercise of sovereignty principles by Angola and South Africa in regard to FDI. It was found that whilst Angola has openly exercised sovereignty principles at the domestic and international levels, thereby directing IFDI, South Africa has done quite the opposite by playing a passive role as far as OFDI is concerned. The chapter comparatively examined the imposition of market-distortions by the governments of both countries. It revealed that, whereas South Africa has not imposed distortions that are sector-specific and effective, Angola has effective national, sector-specific and even firm-specific inducements and distortions that affect the flows and types of IFDI. The examination of the use

of structural power by the two countries also exposed glaring differences: Angola actively deploys structural power, while South Africa does not. Thus, this comparative analysis noted that whereas Angola may be regarded as a country that actively regulates IFDI, South Africa may be seen as a country that passively regulates OFDI.

As a result of these differences, the analysis of how Angola directs IFDI to transfer ESTs could stand, but the analysis on South Africa and how it indirectly and passively regulates OFDI would be unfeasible. Thus, in South Africaôs case, the focus had to shift to the role of individual TNCs. Next, the chapter analysed the transfer of technologies, as well as the transfer of ESTs through IFDI and OFDI. It was found that the evidence produced by the two case studies show that FDI does not uniformly transfer all technologies (software and hardware), but partially transfers some components of such technologies. In this regard, a hierarchy was developed of the general technology components that FDI does transfer, presented in the form of an inverted triangle. At the top of this hierarchy is the transfer of hardware uses in production, specifically machinery and equipment, while the middle tier is composed of the transfer of skills and know-how, and the bottom tier is comprised of the transfer of capacity or ôknow-whyô technologies.

In discussing the Angolan case study, it was found that the country had managed to direct IFDI towards acquiring hardware and know-how through policies and incentives, as well as the participation of SOEs, but had to deal with some infrastructural limitations, policy inconsistencies and enforcement challenges to enable capacity-transfer or transfer of ôknow-whyô technologies. However, the involvement of the state was found to be essential and necessary in directing energy sector IFDI to the transfer of ESTs, and that inward FDI had indeed transferred such technologies, as exemplified by the Angola LNG Project.

The discussion on the transfer of technologies and ESTs by South African TNCs produced some unclear results, which were mainly attributable to the absence of state involvement in the shaping of desired outcomes. What was made clear, though, was that South African energy sector TNCs import general technologies by means of OFDI, and then transfer such technologies to their subsidiaries. But the lack of home-country policy constraints sometimes permits TNCs to disregard the importance of ESTs and only consider technologies for transfer that enhance production capabilities. It was explained that South African energy sector TNCs have the potential to transfer soft-ESTs associated with best environmental practices and international

standards, but lack the manufacturing capabilities to be originators and transferor of ESTs in the form of hardware, such as machinery and equipment.

Finally, Chapter 7 also focussed on the policy-making and implementation implications of the study findings presented in Chapters 5 and 6. It underscored that the evidence presented points towards the necessity of devising explicit policy frameworks and establishing direct institutional structures for channelling FDI to the transfer of ESTs. It emphasised that implicit policy frameworks and indirect institutional structures may lead to the transfer of general technologies crucial for production purposes, but that these might not necessarily be ESTs. Additionally, the chapter stressed that in order for ESTs to be transferred through FDI, states should have the capabilities to create a conducive domestic environment for FDI and harmonise domestic laws and policies with international regimes, whilst TNCs should have the requisite manufacturing capacities to develop technologies in support of EST-transfers. This calls for capacity-building within all the various actors engaged in FDI.

## 8.3 SUMMATIVE RESEARCH FINDINGS

Before outlining the research questions in Chapter 1, the study indicated the necessity of understanding whether FDI does a comprehensive transfer of all the components of technologies, or only partially transfers some to the exclusion of others. This study brings greater clarity to this aspect. It clearly points out that whilst FDI generally transfers technologies, there are some elements that are much more easily transferrable than others. In the case of Angola, for example, the study found that FDI primarily transfers hardware composed of machinery and equipment, as well as people-embodied technologies gained through training and skills-transfer, but has difficulty in transferring paper-embodied technologies, as well as organisational and managerial skills or ôknow-whyô technologies.

The difficulty in transferring paper-embodied technologies can be attributed to three reasons: (1) technology suppliers are not willing to transfer their designs or blueprints to host countries; (2) Angolaôs investments in education were hampered by the civil war, thus many people of working age cannot comprehend complicated engineering designs; and (3) Angola has remained a Portuguese-speaking country, whilst the major foreign investors in the energy sector are from non-Portuguese-speaking countries such as China, the UK, the US and other European countries – hence, the transfer of written materials from these countries is of little relevance. Whereas

difficulties in the transfer of organisational and managerial skills has been attributed to a lack of widespread educational infrastructure, a lack of the transfer of ‘know-why’ skills has been ascribed to the fact that most direct investments are going into greenfield operations, hence not many locals would have been exposed to such projects so as to enable them to grasp and master the systems, as well as any proposed changes to such systems.

The findings on the South Africa case study, even though focused on TNCs without much state involvement, concur with those on Angola in that FDI may be able to easily transfer some elements of technologies, but experience difficulties in transferring others. Like with the Angolan case study, the South African study indicated that the transfer of machinery and equipment through FDI is the primary vehicle, followed by the transfer of skills through in-house and external training, with the lowest order being occupied by the transfer of capacity and ‘know-why’ technologies. The priority given to the transfer of machinery and equipment is premised on the focus of direct investment – ensuring that production takes place, such as power-generation in the case of Eskom Uganda. The transfer of skills and know-how through training hinges on the necessity to ensure greater labour efficiencies and effectiveness, which may lead to an improvement in productivity. Therefore, this study convincingly demonstrates that FDI may easily transfer some elements or components of technologies to African countries.

This policy-science research is guided by four subsidiary research questions that were satisfactorily addressed by this study. The first subsidiary question was: What national and international policies or legislative and institutional mechanisms do Angola utilise to regulate FDI inflows to the energy sector? The study has clearly identified several mechanisms for directing IFDI. First, there are explicit national, sector-specific and sometimes firm-specific legislation and policies, amongst others, the Private Investment Law (Law No. 20/11 of 20 May 2011), generally governing direct investments into Angola; the *Petroleum Act* (Act No. 10/04 of November 2012), regulating investments into the oil and gas sub-sector; and Decree/Law No. 10/07 of 3 October 2007, managing the establishment of the Angola LNG Project. Second, there are direct national, sector-specific and at times project-specific institutions, inter alia, ANIP (the IPA for Angola), MINPET (the Ministry responsible for overseeing investments into oil and gas), Sonangol (an SOE that invests in projects on behalf of the government), and Sonagas (a subsidiary of Sonangol directly involved in the distribution of gas from the Angola LNG project). Third, there are international regimes, the harnessing and domestication of which may facilitate investments into the country; for example, by establishing a DNA that could assist Angola with

the access of funds through the CDM mechanism of the Kyoto Protocol and the UNFCCC. Fourth, there are policies in place that earmark certain sectors, such as the energy sector, as national strategic assets and provide fiscal and financial incentives for direct investments; for example, duty-free imports of all machinery and equipment used to build the Angola LNG Project. And finally, there are inconsequential implicit policies and indirect institutions that may reinforce these mechanisms. It may be concluded, therefore, that the study satisfactorily answered the first subsidiary question by stressing that Angola actively regulates and directs IFDI through co-ordinated and well-established explicit policy frameworks, incentives, and direct institutional structures, interacting with state and non-state actors as well as international regimes.

The second subsidiary question centred on South Africa specifically: What national and international policies, legislative and institutional mechanisms do South Africa use to govern OFDI to the energy sectors of other African countries? The study revealed that South Africa does not have any direct national, sector-specific and even firm-specific mechanisms to direct OFDI. It was shown that the country has certain implicit policies, such as foreign exchange regulations and the ñGateway to Africa and Other Reforms Initiativeò, that are not specifically crafted for OFDI but indirectly and coincidentally affect such investments. Thus, the activities of TISA, the Presidency, DIRCO, the Ministry of Finance and the SARB may have some effects on OFDI flows. It was also established that the country does not have any mechanisms in place for government-imposed inducements to promote OFDI. Moreover, the country lacks mechanisms for directly harnessing and domesticating international regimes.

In this regard, it may be concluded that the second subsidiary question was satisfactorily dealt with, showing that South Africa passively regulates OFDI and has no clear mechanisms to direct such investments nationally and, particularly, from the energy sector. Therefore, since the country lacks mechanisms to direct OFDI, the focus of analysis had to be on individual TNCs engaged in OFDI and the policies devised and institutions established by host countries that are recipients of South African OFDI. Consequently, the South African case study illuminated the effects of undirected OFDI on and to host countries.

The third subsidiary question was also examined in some detail: Is or has increased FDI flows into Angolaôs energy sector been associated with, or linked to, the transfer of ESTs? The key conclusion to be drawn from the evidence is that increased FDI flows into Angolaôs energy sector

can be associated with the transfer of ESTs. The reasons for this are that the country actively directs IFDI though various mechanisms, which has stimulated energy-sector EST-carrying FDI inflows. The state has facilitated the transfer of ESTs through (1) providing incentives based on the types of technologies TNCs transfer, (2) engaging with investment projects through SOEs, (3) crafting explicit national and sector-specific environmental policies, and (4) facilitating the harmonisation of local policies with international regimes.

The evidence garnered from the firm-specific example of the Angola LNG Project, an IFDI operation involving Chevron, Total, Eni, BP and Sonangol, confirmed the transfer of ESTs into the energy sector. This project was considered a good example of an investment transferring ESTs, because it curbed the rampant gas-venting and gas-flaring that was so prevalent in the oil and gas industries prior to the launch of the project. This firm-specific case study demonstrated that ESTs are mainly transferred for two reasons. First, the investment is a greenfield operation, successfully transferring hardware, specifically new, more-efficient and less-polluting technologies in the form of machinery and equipment. Second, critical and in-depth consideration was given to the environmental impacts of the project, and then only were international standards utilised in conducting environmental impact assessments and developing environmental management plans. Therefore, it can be stated categorically that the case study of Angola revealed that the active involvement of the state in directing IFDI lead to the transfer of ESTs associated with cleaner technologies, particularly if home countries have relevant technological capabilities to manufacture and transfer such ESTs.

The final subsidiary question was: Is or has South Africaôs OFDI transferred ESTs to the energy sectors of other African countries? This question was addressed through firm-specific case studies in Chapter 6. The critical difference in the South African case study, compared to that on Angola, was the absence of the involvement of the South African state in OFDI matters. This meant that the examination of the transfer of ESTs through OFDI had to focus on the activities of energy sector TNCs, in particular Eskom Enterprises with investments in Ugandaôs power sector through Eskom Uganda Ltd.

The South Africa case study demonstrated that generally when TNCs are left on their own without any explicit policies conditioning their OFDI they may indeed transfer technologies, primarily hardware that includes machinery and equipment, as well as people-embodied technologies or know-how through training and skills-transfer. However, the motivations

underpinning the transfer of such technologies are mainly to create efficiencies in production so as to realise profit, and not necessarily any inclination towards environmental protection or indicating an environmental management ethos. Nevertheless, in the process of transferring technologies, some ESTs may coincidentally and accidentally be transferred. To exemplify this, the case study on Eskom Uganda does not clearly show any deliberate effort from Eskom Enterprises to transfer ESTs, but it does demonstrate the transfer of new spare parts and components for the power-generation plant in order to enhance efficiencies and produce less pollution.

Furthermore, the study underlined the fact that when the activities of TNCs are not directed by an entity such as the state, in-house technological capacities, specifically manufacturing capabilities, become critical determinants of the types of technologies TNCs transfer. In the Eskom Enterprises case, the lack of in-house technological capabilities to manufacture ESTs and technologies, in general, has made the TNC dependent on imports from the international market. Thus, it was concluded that, rather than being EST-generators and transferors, South African energy sector TNCs are simply conduits through which ESTs from certain countries are directed to other African countries.

However, the South Africa case study also demonstrated that energy sector TNCs are able to transfer ESTs consisting of best environmental management practices, as well as information necessary for international standards certification in the field of environmental protection and management. For example, Eskom Enterprises demonstrated the transfer of these elements by engaging Eskom Uganda in processes that led to the subsidiary being accredited under South African environmental certification and later ISO certification standards. However, it has been noted that the transfer of practices that represent ESTs to the majority of company employees is fairly limited, as these processes are usually conducted in a top-down fashion and directed by the headquarters rather than the subsidiary.

The conclusion that is drawn from the South Africa case study is that when states passively direct OFDI they give leeway to TNCs to make individual decisions on what types of technologies they transfer, and these decisions may not necessarily give due regard to the environment. For this reason, the transfer of ESTs cannot be realised when left to the decisions of TNCs acting on their own. Therefore, the intervention of the state through various mechanisms is imperative for OFDI to transfer ESTs.

## 8.4 SOME POLICY RECOMENDATIONS

This study generates a wide range of recommendations to be considered by different groups. The empirical data gathered can also be used to develop various policies, regulations and other measures pertaining to FDI and the transfer of ESTs. There are some key policy recommendations that can be made, based on this study and, in particular, the two case studies presented.

1. The governance of FDI and the transfer of ESTs is an issue for national governments and also have implications for international relations and foreign policy. For a country to successfully utilise FDI to attract or acquire ESTs it must have explicit policies and regulations in place, as well as capable agencies to implement them. Policies and regulations should be backed by strong legislative powers, particularly constitutional provisions that enable state actors to negotiate for the inclusion of ESTs into FDI packages.
2. As shown in the case of Angola, countries can invoke national sovereignty principles and use their foreign relations to stimulate and facilitate the transfer of technologies through FDI. It is, therefore, recommended that African countries experiment with the national sovereignty provisions of their legal and policy frameworks, as well as institutional structures, to stimulate and facilitate EST-carrying FDI.
3. As demonstrated by this study, the transfer of ESTs through FDI can only take place effectively if host countries have critical endogenous capabilities, amongst others, in the form of national agencies which are capable of assessing the content of FDI and ensuring that technology in general, and ESTs in particular, are components of such investments. In this regard, African countries generally and particularly FDI-receiving countries, such as Angola, should take measures that will strengthen their institutional arrangements. By this is meant the whole range of agencies that are involved in FDI negotiations, regulation and technology development, as well as scientific and technological development in general. This is of crucial importance as FDI is needed for national systems of innovation as well.
4. This study has also shown that a number of African countries are important sources of FDI. South Africa is a key source of FDI into the energy sectors of a growing number of other African countries. It is imperative that South Africa and other African countries that are OFDI suppliers develop policies and regulations that ensure that their FDI contributes to the transfer of ESTs. In general, FDI home countries need to put in place measures that promote the transfer of ESTs. This is actually an international obligation they incurred by assenting to international obligations, such as those under Agenda 21 and various UN Conventions.

5. The study clearly demonstrates that FDI and the transfer of ESTs are important matters within the context of foreign policy and international relations. These matters cannot simply be left to be dealt with by a single sectoral, or an isolated department of government, or an individual company in a host or home country. Indeed, the good governance of FDI that transfers ESTs requires an institutional arrangement that deals with economics, politics, and technology-related matters. In most African countries such an inter-departmental mechanism is likely to be located in the Presidency or in the Prime Ministerôs office, thus at the national and not at the sectoral level. It is, therefore, recommended that the co-ordination of FDI should be a mandatory responsibility of the head of government – that is, the President or the Prime Minister. The case of Angola clearly shows that effective FDI takes place only if it is located in the office of the head of government.

## 8.5 CHALLENGES EXPERIENCED DURING THE COURSE OF THE RESEARCH

A number of challenges were faced in conducting this study. First, available literature sources do not establish an explicit link to the research problem posed by this study. Realising this, a conceptual framework had to be created that tie together the different strands of information mined from the available literature, as well as the complementary information garnered from interviews with firm, sector and national-level functionaries.

Second, this study had to confront challenges such as the complexity of FDI data. There is no clarity in the existing literature on whether the OFDI figures given relate to direct investment flows made to other parts of the world by African TNCs, or whether they include intra-African investments as well. Furthermore, the analysis of South Africaôs OFDI proved to be rather complex, for two reasons. The first reason is that there are some differences between the figures reported as OFDI by South African institutions and those reported by host countries, recipients of South African FDI. For example, Gelb (2010) found several discrepancies in the data reported by the South African Reserve Bank and the Ministry of Commerce of China. These differences raise the question of whether outward FDI figures are an overestimate or an underestimate. This study uses figures in reports from a single institution without getting embroiled in the making of comparisons, thus avoiding a debate on which figures are of a better quality than others. The second reason is that it is not always easy to determine if a firm is indeed South African. There are a number of companies that were founded in South Africa but have since listed at international stock exchanges, or relocated their head offices to the developed world, in particular

to the UK, Switzerland, and the US. These émigréô firms and the outward FDI associated with them are somewhat problematic to regard as South African. However, this study includes the émigréô companies as South African, just like many earlier studies, but it should be kept in mind that such an inclusion inflates the figures that are reported as South African outward FDI.

Third, navigating the energy sector in Angola proved a challenge as this sector is directly controlled by the Presidency. In order to officially access and interview government officials there was a need for security clearance which could not easily be obtained. Furthermore, employees of TNCs in Angola had to go through lengthy processes and procedures before approval was granted for interviews; this included clearance by their headquarters before they could be officially interviewed. In this context, interviews constantly had to be rescheduled, and re-interviewing some individuals when more relevant information was needed proved to be extremely difficult. However, a network established whilst working in Angola was utilised to obtain the necessary clearances and collect data for the study. In addition, some of officials were interviewed in their personal capacities and not as representatives of the departments or organisations that employed them. In order to re-interview certain people, their incomplete reports were sent to them, hopefully motivating them to respond and fill in gaps in the reports.

Fourth, the legal interpretation of Angolan laws and policies demanded the use of lawyers who are familiar with the historical development of the domestic legal system and able to do an analysis that links it to Portugalôs laws and policies. Many lawyers based in South Africa to whom there was easy access were not able to proffer any detailed analysis. In order to deal with this challenge, relationships had to be established with law lecturers, independent researchers, as well as financial, legal and advisory firms operating inside Angola. Besides the legal statutes and policy documents, most company documents from Angola were in Portuguese, which made it difficult to share and discuss in-depth with non-Portuguese-speaking reviewers. When required, some documents from which it was crucial to derive proper findings, had to be translated so that reviewers could comment and make interpretations based on the original source material.

Fifth, some government departments were afflicted by a high staff turnover. This made it difficult for new incumbents to provide the historical background on, and information about, government departments and policies. This also posed a particular challenge as verification of historical data on institutional arrangements and changes could not be gleaned from discussions with new staff members. Similarly, UN agencies frequently employ consultants and they were not forthcoming

on projects they were no longer involved in. In dealing with this challenge, secondary and primary data had to be integrated in an attempt to create a fuller picture of institutional and policy developments.

Finally, although field or site visits to the Soyo gas-processing and storage facility in Angola and the Nalubaale and Kiira hydro-power plants in Uganda were proposed during the initial planning stages of this study, these proved rather difficult to arrange and were, therefore, not conducted. Also, some interviewees were of the opinion that site visits would have added very little to the content to this study.

## 8.6 RECOMMENDATIONS FOR FUTURE RESEARCH

The opportunities for further research on issues of FDI and the transfer of ESTs are huge. This study has only dealt with a few specific issues pertaining to FDI as it is governed or passively regulated by state actors, in particular by governments. Further research needs to be done on:

1. The design of a strong conceptual framework for dealing with issues of FDI and linkages to technology transfer, which is still in its infancy. This study is, most probably, among the first to bring together the international relations of FDI, the political economy, and the economics of technology transfer in a single document. However, the framework that was proposed requires further refinement. Further research that strengthens the conceptual framework is, therefore, essential.
2. This research study has focused on the role of the state in regulating FDI and the transfer of technologies. FDI, for the most part, is undertaken by and through private sector enterprises, and generally technologies are developed and transferred by such companies. A better understanding of the behaviour of companies in both home and host countries, and what would motivate them to engage in investments that would transfer ESTs, would greatly enrich scholarship in this field. It is, therefore, recommended that further research be done on the role of non-state actors in influencing FDI that transfer ESTs. This research should focus on issues such as intellectual property rights and protection, as well as civil society organisations and their role in promoting environmental stewardship on FDI.
3. As indicated in this study, there is evidence of increasing South-South or intra-South FDI flows. Not much is known about such FDI flows and their content. There is also very little information on whether and how such FDI flows could contribute to the transfer of

technologies in general, and ESTs in particular. It is recommended that further research be done on effective intra-South FDI that could transfer such technologies.

4. In general, further research on issues of FDI and the transfer of ESTs need to be conducted to examine other areas, such as the mining and agricultural sectors.
5. Finally, and related to the above research focus, research needs to be conducted on the effects of FDI to informal sectors (usually non-registered small scale entities), especially in relation to the transfer of technologies. This research would examine policy and institutional arrangements related to the interactions of TNCs with informal-sector entities. It should also focus on the legal and policy strategies guiding FDI and technology-transfer arrangements, as well as the nature and content of the technologies involved. This type of research would be useful in terms of informing public policy on the role of TNCs or FDI in promoting economic change and development driven by businesses based in the informal sector. It could ultimately provide guidance to policy-makers and policy practitioners on how informal-sector businesses may benefit from such interactions and linkages, and how this may lead to sustainable development.

## 8.7 CONCLUSION

This study has explored the transfer of ESTs through FDI in the context of Africa in general, and South Africa and Angola in particular. It utilised an interdisciplinary conceptual framework and some case studies to examine whether FDI can be used to transfer environmentally sound technologies (ESTs). On the one hand, the case study of Angola demonstrated the centrality of FDI-host countries in shaping policies and institutions that stimulate and facilitate EST-carrying energy sector IFDI. The conclusion to be drawn from this case study is the evident necessity for host countries to exercise their sovereignty principles, impose market-distortions and inducements, use structural power, and actively participate in and harness international relations for the transfer of ESTs through FDI. On the other hand, the South African case study focused on the transfer of ESTs from the energy sector to other African countries, in particular Uganda. It indicated that South Africa has not deliberately and intentionally facilitated the transfer of ESTs through OFDI to other African countries, such as Uganda. The conclusion to be drawn from this case study is that home countries have to respect international regimes and adhere to the international obligations they impose in order for OFDI to transfer ESTs.

The two key recommendations from this study are as follows: (1) African policy-makers and practitioners should shun a reductionist approach to FDI and begin to view such an investment as a multi-dimensional bundle of resources that may contribute to sustainable development in a multi-faceted manner; and (2) further policy-science research that will generate empirical evidence for African policy-makers engaged in international negotiations, and for policy practitioners involved in programmes on FDI and technology transfer as well as in sustainable development, should be encouraged.

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Tanzania. Natural Gas Policy of 2013.

Tanzania. Natural Gas Act.

Zimbabwe. Mines and Minerals Act (Chapter 21:05).

Zimbabwe. Zimbabwe Mining Development Act (Chapter 21:08).

# APPENDIXES

## APPENDIX A: INTERVIEW-GUIDING QUESTIONNAIRE FOR ANGOLAN ENERGY SECTOR STUDIES

**Title of Study**: Foreign Direct Investment and the Transfer of Environmentally Sound Technologies in Africa: Cases Studies in the Energy Sectors of Angola and South Africa

**Principal Investigator:** Albert Edgar Manyuchi, University of Pretoria

**Study Supervisors**: Prof John Mugabe; Dr Yolanda Spies, University of Pretoria

**Section 1: General Questions (can be completed by the interviewer)**

1. Type of Organisation: Government Min/Dept ☐ Parastatal ☐
2. Function or Post of Respondent: é é é é é é é é é é . ☐ ☐

**Section 2: General Interview-Guiding Questions**

1. From which countries are the TNCs that facilitate FDI into the energy sector in Angola?
2. How would you characterise an energy-sector IFDI project and the actors who are involved in an IFDI-based energy sector project?
3. What is the role of the state in the governance of IFDI to the energy sector?
4. What national institutions, policies and laws facilitate and promote IFDI into the energy sector in Angola and how do these policies and institutions facilitate such IFDI? What regional and international policies and institutions promote IFDI into the energy sector in Angola, and how do these policies and institutions promote such IFDI? How are regional and international regimes harnessed and domesticated in support of IFDI into the energy sector?
5. What incentives and barriers are instituted to promote/dissuade energy sector IFDI?
6. What policy and institutional mechanisms exist to co-ordinate and build synergies between national IFDI policies and institutions? What mechanisms are in place to co-ordinate national policies and international regimes?
7. How does IFDI transfer technologies into the energy sector in Angola? What types of technologies are transferred into the energy sector through IFDI? What is the role of the state in directing such transfers?
8. How does IFDI into the energy sector transfer ESTs? What types of ESTs are transferred into the energy sector through IFDI? What is the role of the state in directing such transfers?

9. Are there some linkages between TNCs and domestic firms operating in the energy sector in order to facilitate the transfer of environmentally sound technologies?

## APPENDIX B: INTERVIEW-GUIDING QUESTIONNAIRE FOR SOUTH AFRICAN ENERGY SECTOR STUDIES

**Title of Study**: Foreign Direct Investment and the Transfer of Environmentally Sound Technologies in Africa: Cases Studies in the Energy Sectors of Angola and South Africa

**Principal Investigator:** Albert Edgar Manyuchi, University of Pretoria

**Study Supervisors**: Prof John Mugabe; Dr Yolanda Spies, University of Pretoria

### Section 1: General Questions (can be completed by the interviewer)

1. Type of Organisation: Government Min/Dept ☐ Parastatal ☐
2. Function or Post of Respondent: é é é é é é é é é . ☐ ☐

### Section 2: General Interview-Guiding Questions

1. Which South African energy sector TNCs facilitate OFDI from the sector? In which countries does South African energy sector TNCs invest?

2. How would you characterise an OFDI energy sector project being conducted by a South African TNC and what actors are involved in an OFDI-based energy sector project?

3. What is the role of the state in OFDI from the energy sector? What national institutions, policies and laws facilitate and promote OFDI from the South African energy sector, and how do these policies and institutions facilitate such OFDI? What regional and international policies and institutions promote OFDI from South Africaôs energy sector, and how do these policies and institutions promote such OFDI? How are regional and international regimes harnessed and domesticated in support of OFDI from the energy sector?

4. What barriers or incentives have been put in place by the state to facilitate/dissuade energy sector OFDI?

5. What policy and institutional mechanisms exist to co-ordinate and build synergies between national OFDI policies and institutions? What institutions have been established and policies introduced to facilitate co-ordination between national, regional and international OFDI regimes?

6. How does OFDI from South Africaôs energy sector transfer technologies? What types of technologies are transferred from the energy sector through OFDI? What is the role of the state in directing such transfers?

7. How does OFDI from the energy sector transfer ESTs? What types of ESTs are transferred from the energy sector through OFDI? What is the role of the state in directing such transfers?

8. Are there some established linkages between South African TNCs and domestic firms operating in the energy sector in order to facilitate the transfer of environmentally sound technologies?

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## APPENDIX C: INTERVIEW-GUIDING QUESTIONNAIRE FOR ANGOLAN FIRM-LEVEL STUDIES

**Title of Study**: Foreign Direct Investment and the Transfer of Environmentally Sound Technologies in Africa: Cases Studies in the Energy Sectors of Angola and South Africa

**Principal Investigator:** Albert Edgar Manyuchi, University of Pretoria

**Study Supervisors**: Prof John Mugabe; Dr Yolanda Spies, University of Pretoria

### Section 1: Introductory Questions (can be completed by the interviewer)

1. Type of Organisation: Private ☐ Public ☐

2. Function or Post of Respondent: é .é é é é é é é é ☐ ☐

### Section 2: Questions about Foreign Direct Investment and the Transfer of ESTs

1. What is the background to your IFDI into Angolaôs energy sector?

2. What has been the role of the state in promoting and directing your IFDI into Angolaôs energy sector? How did national institutions, policies and laws facilitate or promote your IFDI? What are the national policies, laws and institutions that govern your IFDI? How did the state facilitate interactions with regional and international policies and institutions to promote your IFDI? What are the regional and international regimes that govern your IFDI into the energy sector?

3. What incentives or barriers and interventions did the state impose to support/dissuade this IFDI?

4. What mechanisms did the state create to facilitate co-ordination and building synergies for the benefit of this IFDI?

5. How does your IFDI project transfer technologies into Angolaôs energy sector? What types of technologies does your IFDI project transfer? What has been the role of the state in directing the transfer of these technologies?

6. What is the role of your firmôs IFDI in transferring environmentally sound technologies into Angolaôs energy sector? What types of environmentally sound technologies are transferred through your IFDI? What has been the role of the state in directing the transfer of these technologies?

7. Are there some national policies and institutions in Angola to facilitate the transfer of environmentally sound technologies through your IFDI?

8. Does your firm utilise some international, regional or bilateral instruments and institutions in order to transfer environmentally sound technologies into Angola?

9. Are there established linkages between your firm and other domestic firms relating to this IFDI that are beneficial in transferring technologies, including EST?

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## APPENDIX D: INTERVIEW-GUIDING QUESTIONNAIRE FOR SOUTH AFRICAN FIRM-LEVEL STUDIES

**Title of Study**: Foreign Direct Investment and the Transfer of Environmentally Sound Technologies in Africa: Cases Studies in the Energy Sectors of Angola and South Africa

**Principal Investigator:** Albert Edgar Manyuchi, University of Pretoria

**Study Supervisors**: Prof John Mugabe; Dr Yolanda Spies, University of Pretoria

**Section 1: Introductory Questions (can be completed by the interviewer)**

1. Type of Organisation: Private ☐ Public ☐
2. Function or Post of Respondent: é é ..é é é é é é é é ☐ ☐

**Section 2: Questions about Foreign Direct Investment and the Transfer of ESTs**

1. What is the background to your OFDI from South Africaôs energy sector?
2. What has been the role of the state in facilitating your OFDI? How did national institutions, policies and laws facilitate or promote your OFDI? What are the national policies, laws and institutions that govern your OFDI? How did the state facilitate interactions with regional and international policies and institutions to promote your OFDI into Uganda? What are the regional and international regimes that govern your OFDI into the energy sector in Uganda?
3. What incentives or barriers and interventions did the state impose to support/dissuade this OFDI?
4. What mechanisms did the state create to facilitate co-ordination and building synergies for the benefit of this OFDI?
5. How does your OFDI project transfer technologies into Ugandaôs energy sector? What types of technologies does your OFDI project in the energy sector transfer? What has been the role of the state in directing the transfer of technologies through this project?
6. What is the role of your firmôs OFDI in transferring environmentally sound technologies into Ugandaôs energy sector? What types of environmentally sound technologies are transferred through your OFDI? What has been the role of the state in directing the transfer of ESTs into Uganda through this project?
7. Are there some national policies and institutions in South Africa to facilitate the transfer of environmentally sound technologies through your OFDI?
8. Does your firm utilise some international, regional or bilateral instruments and institutions in order to transfer environmentally sound technologies into Uganda?

9. Are there some established linkages between your firm and domestic firms relating to this OFDI that are beneficial in transferring technologies, including EST?

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## APPENDIX E: INFORMED-CONSENT COVERING LETTER

Department of Political Sciences
University of Pretoria
Pretoria 0002
0027 (0)12-420-4965 (office)
0027 (0)12-4203886 (fax)

Date

**(Interviewee particulars)**

Dear é

## INTERVIEW: INDIVIDUAL INFORMED-CONSENT

1. Mr Albert Edgar Manyuchi is a registered postgraduate student for a DPhil degree in International Relations in the Department of Political Sciences, University of Pretoria. He is conducting research on ñForeign Direct Investment and the Transfer of Environmentally Sound Technologies in Africa: Case Studies in the Energy Sectors of Angola and South Africaò under the supervision of Prof John Mugabe and Dr Yolanda Spies.
2. The purpose of the study is academic (in fulfilment of degree requirements) and is aimed at strengthening public-policy formulation and practices in the field of FDI, specifically as it pertains to the transfer of environmentally sound technologies in Africa.
3. Interviews are being conducted to obtain perspectives, explanations and experiences from a range of stakeholders in the field. Individual interviews will be unstructured, but a list of guiding questions is attached to facilitate discussion on the themes pertaining to the research.
4. With the permission of the interviewee, the inputs of this interview will be utilised for the purposes of writing and documenting the research dissertation.
5. The interviewee will remain anonymous and may choose whether note-taking, recording, or both would be preferred as a means of capturing the essence of the interview.
6. There will be no risks or discomforts (physical or mentally) to the interviewee.
7. The interviewee may ï by notifying the researcher and without any adverse consequences ï withdraw and terminate his/her participation prior to, during, or after the interview. Should the interviewee withdraw, records of the interview will not be used for research purposes and will be destroyed.
8. The data and/or notes generated by the interview will, in accordance with University policy and requirements, be stored for 15 years at the Department of Political Sciences, University of Pretoria. The research results will be documented in the form of a thesis that will be made available to all University libraries and after the examination thereof a copy will also be provided to *** (if applicable).
9. The research data generated through these interviews will be used for the stated purposes of the aforesaid dissertation and is not intended for re-use. Should an application be made for the re-use of the research data after the completion of the dissertation and during the

mandatory storage period, such re-use will be subject to the written approval of the interviewee(s).

10. The interviewee and his/her commissioning institution has the right of access to the researcher and/or the academic department (see the contact particulars indicated in the letterhead) should the need arise.
11. Please complete and sign the attached form for individual informed-consent and return it to the researcher for record purposes.

Yours sincerely

Name and Signature

## APPENDIX F: INTERVIEW -- INDIVIDUAL INFORMED-CONSENT

**Student No:** 10556304

**Student Name:** Albert Edgar Manyuchi

**Degree:** DPhil in International Relations

**Title:** Foreign Direct Investment and the Transfer of Environmentally Sound Technologies in Africa: Case Studies in the Energy Sectors of Angola and South Africa

I, the undersigned,

TITLE:

INITIALS AND SURNAME:

INSTITUTION/COMPANY/INTEREST GROUP:

POSITION/APPOINTMENT:

ADDRESS:

have been fully informed about the purpose of the research and understand the conditions of informed-consent under which I shall be interviewed. I hereby grant permission for the interview on condition that:

*** Delete what is not applicable**

the interview *may/may not be *electronically recorded/documented in a written form for research purposes.

*my name, and affiliation to _____ may be used and cited for the purposes of the dissertation only and not for publication.

*if the researcher wishes to pursue publication at a later stage, my name and affiliation to _____ *may be cited/may be cited only with prior informed-consent.

*my name may not be used or cited, or my identity otherwise disclosed in this research project, dissertation or related articles, but the interview can be used or cited on a basis of anonymity.

*the interview may not be used or cited, or my identity otherwise disclosed in this research project, dissertation or related articles.

Interviewee Signature: ---------- Date:---------- Place: ----------

Researcher Signature: ---------- Date:---------- Place: ----------

## APPENDIX G: NUMBER OF ACTUAL INTERVIEWS CONDUCTED BY TYPE

| Type of Interview | International | Regional | | Country-Specific | | Total |
|---|---|---|---|---|---|---|
| | | Africa | SADC | Angola | South Africa | |
| **Tel. Interviews** | 2 | 3 | 2 | 9 | 26 | **42** |
| **Email Interviews** | 4 | 0 | 0 | 12 | 3 | **19** |
| **Face-to-Face** | 4 | 1 | 0 | 13 | 28 | **46** |
| **Total** | **10** | **4** | **2** | **34** | **57** | **107** |

## APPENDIX H: A LIST OF INTERNATIONAL INVESTMENT AGREEMENTS AND OTHER INVESTMENT-RELATED AGREEMENTS SINGED BY ANGOLA

### 10.8a Investment-Related Agreements signed by Angola

| Title of Agreement | Short Title | Parties | Status | Date of Signing | Date of Entry into Force |
|---|---|---|---|---|---|
| Trade and Investment Framework Agreement between the US and Angola | Angola-US TIFA | Angola & the US | Signed | 19/05/2009 | |
| Interim Economic Partnership Agreement between the European Union (EU) and the Southern African Development Community (SADC) | EU-SADC Interim Agreement | EU & the SADC | Signed | 22/01/2009 | |
| SADC Protocol on Finance and Investment | SADC Investment Protocol | SADC | In Force | 18/08/2006 | 16/04/2010 |
| Partnership Agreement between the member states of the African, Caribbean and Pacific (ACP) group, and the European Union (EU) | Cotonou Agreement | ACP & the EU | In Force | 23/06/2000 | 01/04/2003 |
| Treaty establishing the Southern African Development Community (SADC) | SADC Treaty | SADC | In Force | 17/08/1992 | 30/09/1993 |
| Treaty establishing the African Economic Community/African Union (AU) | AU Treaty | AU | In Force | 03/06/1991 | 12/05/1994 |
| Treaty for the establishment of the Economic Community of Central African States (ECCAS) | ECCAS Treaty | ECCAS | In Force | 18/10/1983 | 18/12/1984 |

**10.8b Other Investment-Related Agreements signed by Angola**

| No. | Short Title | Date of Adoption | Level | Type |
|---|---|---|---|---|
| 1 | SADC Model BIT | 2012 | Regional/Plurilateral | Model Agreements |
| 2 | OPEC Fund Model Agreement | 2001 | Regional/Plurilateral | Model Agreements |
| 3 | Fifth Protocol to GATS | 1997 | Multilateral | Intergovernmental Agreements |
| 4 | Fourth Protocol to GATS | 1997 | Multilateral | Intergovernmental Agreements |
| 5 | TRIPS | 1994 | Multilateral | Intergovernmental Agreements |
| 6 | TRIMS | 1994 | Multilateral | Intergovernmental Agreements |
| 7 | GATS | 1994 | Multilateral | Intergovernmental Agreements |
| 8 | MIGA Convention | 1985 | Multilateral | Intergovernmental Agreements |
| 9 | UN Code of Conduct on Transnational Corporations | 1983 | Multilateral | Draft Instruments |
| 10 | UN Guiding Principles on Business and Human Rights | 2011 | Multilateral | Guidelines, Principles, Resolutions and Similar |
| 11 | ILO Tripartite Declaration on Multinational Enterprises | 2006 | Multilateral | Guidelines, Principles, Resolutions and Similar |
| 12 | Doha Declaration | 2001 | Multilateral | Guidelines, Principles, Resolutions and Similar |
| 13 | ILO Tripartite Declaration on Multinational Enterprises | 2000 | Multilateral | Guidelines, Principles, Resolutions and Similar |
| 14 | Singapore Ministerial Declaration | 1996 | Multilateral | Guidelines, Principles, Resolutions and Similar |
| 15 | World Bank Investment Guidelines | 1992 | Multilateral | Guidelines, Principles, Resolutions and Similar |
| 16 | ILO Tripartite Declaration on Multinational Enterprises | 1977 | Multilateral | Guidelines, Principles, Resolutions and Similar |
| 17 | New International Economic Order UN Resolution | 1974 | Multilateral | Guidelines, Principles, Resolutions and Similar |
| 18 | Charter of Economic Rights and Duties of States | 1974 | Multilateral | Guidelines, Principles, Resolutions and Similar |

| | | | | |
|---|---|---|---|---|
| 19 | Permanent Sovereignty UN Resolution | 1962 | Multilateral | Guidelines, Principles, Resolutions and Similar |

## APPENDIX I: A LIST OF NATIONAL POLICIES AND LAWS THAT GUIDED EIA PROCESSES FOR ANGOLA'S LNG PROJECT

| Angola's Key Environmental Legislation Relating to the Angola LNG Project | |
|---|---|
| **Regulation** | **Key Aspects** |
| **Environmental Protection** | |
| Angolan Constitution, Article 12 | The state shall promote the protection and conservation of natural resources and guiding the exploitation and use thereof for the benefit of the community as a whole. |
| Angolan Constitution, Article 24 | All citizens shall have the right to live in a healthy and unpolluted environment. The state shall take appropriate measures to protect the environment and flora and fauna species to maintain ecological balance. Acts that damage or directly or indirectly jeopardize conservation of the environment shall be punishable by law. |
| General Environment Law of 1998 | This law contains general standards that require regulation in order to be applied in practice, which are complemented by various international conventions ratified by Angola. The law establishes the principle of strict liability for environmental offences. It also establishes the requirement for major activities in Angola to be subject to Environmental Impact Assessments (EIAs) and sets out the general requirements for such assessments. |
| **Impact Assessment** | |
| Decree 39/00 on Environmental Protection for the Petroleum Industry (PIEPD) | This decree is administered by the Ministry of Petroleum and sets out specific EIA requirements for the petroleum industry, following the framework requirements set out in the General Environmental Law 5/98. |
| Decree 51/04 on Environmental Impact Assessment, Council of Ministers | This decree provides the content and structure of the EIA, including consultation, approval procedure, timeframe, the role of regulators, and the issuance of permits. |
| **Land Use and Resettlement** | |
| Angolan Constitution, Article 12 | Land belonging to the state may be transferred to individuals or corporate bodies in accordance with the law. The Constitution provides that the state will respect and protect the property and ownership of land owned by individuals or corporate bodies, without prejudice to the possibility of expropriation in the public interest. |
| **Regulation** | **Key Aspects** |
| Land Law 09/04 (November 2004) | This law establishes the general basis for the legal system regulating land owned by the state, including the rules for establishment, transfer, exercise, and lapse of property rights. The law reinforces the constitutional principle that the land belongs to the state. The state may transmit or constitute property rights on land falling within its private domain. However, the state cannot transmit the right to explore for minerals, so mining rights are still inalienable. The basic principle which governs the Draft Land Law is that the state may transmit the property or constitute property rights over the |

| | |
|---|---|
| | land, but it does not imply acquisition by accession or any other manner of any right over natural resources. |
| Decree No. 1/01 and Decree No. 79/02 | Provincial governments are empowered to schedule, organise and ensure the execution of all the processes related to the return and resettlement of displaced people. Each family being resettled should be awarded half a hectare of cultivable land without payment. Resettlement areas must have sufficient space for the construction of shelters. |