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## The Link between Energy Economics, Consumer Behaviour and Tourism. A Literature Review

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### Abstract:

Tourism globally is a rapidly advancing industry, and this has attracted much attention from practitioners and academics. However, the interrelatedness between energy economics, consumer behaviour and tourism are a fairly under-researched phenomenon. This research therefore serves as an attempt to investigate the link between the two and explore existing literature to provide new insights into how energy resources have impacted tourism growth and development. Select tourism destinations were utilised for purposes of this research. In order to collect enough and relevant data, a selection of empirical studies on tourism and energy economics from 2000 to 2019 were systematically reviewed, analysed and discussed. Publicly accessible government and industry data sources were utilised for purposes of the study as well as academic literature popular scientific databases that include Science direct, Ebsco and Emerald. Based on findings of the research recurring themes and trends were identified. Findings provided sufficient evidence to suggest that the success of the tourism industry is dependent on effective energy policies.

**Keywords:** energy economics; resources; utilization; tourism.

**JEL Classification:** O13; P48; Z30.

### Introduction

Energy is widely viewed as fundamental human need throughout history (Çora and Mikail 2020). Energy economics is a field of economics focused on assessing human utilisation of energy resources and energy commodities, and the resulting outcomes of that utilisation (Hasanuzzaman nd Rahim 2020; Sweeney 2001). Energy economics and consumer behaviour have been studied in prior research studies however, the introduction of tourism has seldom received the same attention. This research therefore tries to illustrate how the three are linked. Effective energy management can act as an important function to lower energy consumption, which is vital in the fight to protect natural resources and maintaining a clean environment (Nabeel, Ali and Hamdan 2019). The electric power industry is a major force powering global energy effort and is also only sector where all types of primary fuels compete for market-share (Firsova, Vasbieva, Kosarenko, Khvatova and Klebanov 2018). Energy commodities such as fuel, natural gas, propane, coal and electricity can be utilised for energy generation beneficial to human activity that include lighting, space and water heating, cooking and electronic powering (Sweeney 2001). As for energy resources, crude oil, biomass, hydro, uranium, wind, sunlight, or geothermal deposits can be harvested to produce energy commodities (Sweeney 2001). This paper looks broadly at the link between energy economics and tourism but especially attention is made to the oil industry in particular as it is a major part of energy economics. Furthermore, this study pay special attention to how Gulf region states have approached oil diversification through tourism. Economic diversification has been a staple of the agenda Gulf Cooperation Council (GCC) states, as oil-dependency has not lead to fully satisfactory income sources due to made GCC economies deeply vulnerable to the price volatility of internationalized hydrocarbon markets (Kurbusi 1984; El Hag and El Shazly 2012; Buckley and Hanieh 2014).

The city-state of Dubai in particular with its declining oil reserves, has embarked on an array of non-oil forms of economic development, placing itself as a leader in processes of economic liberalisation and service-sector-based diversification across the Gulf region (Buckley and Hanieh 2014). For many years, oil has consistently been considered as the premier global source of energy (Mikhaylov and Moiseev 2019). This was primary because all nations consume the resource and as a result prices of oil and its derivatives are of major interest to both producers and consumers (Mikhaylov and Moiseev 2019). Tourism is one particular industry that has been impacted and has seen significant growth as a result of the advancement of energy economics and utilisation of energy economics. As a result, the marketing of destinations is considered a phenomenon (Chuchu 2020; Matlovičová and Husárová 2017). Energy is an essential part of human life; thus a secure, sufficient and accessible supply of energy is imperative for the sustainability of modern societies (Bhat and Prakash 2009). The demand for the provision of energy is on the rise globally and the trend is likely to progress significantly in future (Bhat and Prakash 2009). This therefore calls for the diversification of resources and possibly introduction of other means such as tourism which the present research makes a case for. This then also means investment towards renewable energy sources should be escalated so as to release pressure on non-renewable energy sources such as oil. Low focus on renewable energy was echoed by Bhat and Prakash (2009) who stated that globally, renewable energy only accounts for 2% while 40% originates from coal, 20% from gas, 16% from nuclear, 16% from hydro, 7% from oil. Consequently, renewable energy resources have increasingly vital for power generation at commercial level due to their multitudes of uses, put together with the government incentives and public corporation (Adefarati and Bansal 2019).

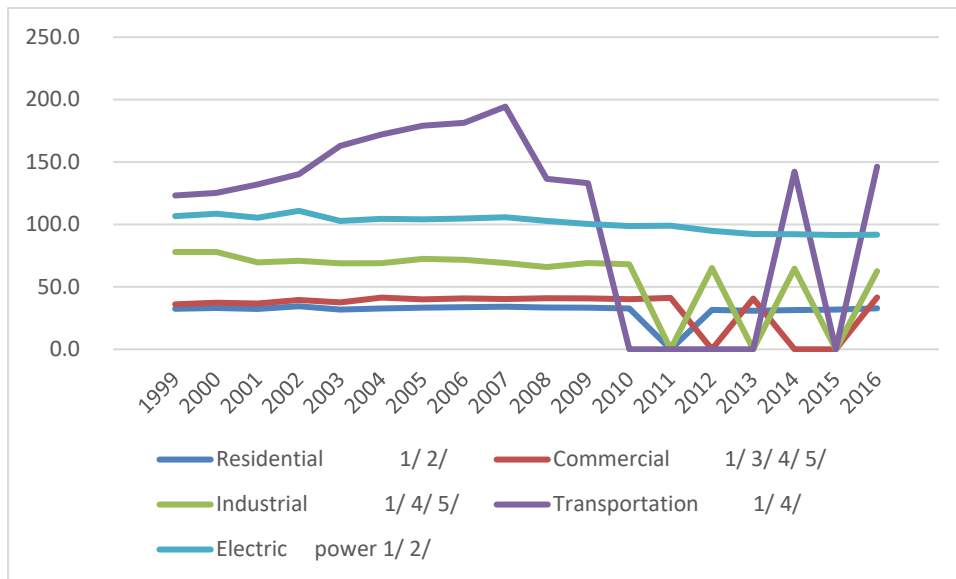
## 1. Literature Review

### 1.1 The Link between Energy Economics and Tourism

Select tourist destinations were reviewed in terms of their energy consumption and these include Dubai, Hawaii and South Africa. However, the study was not limited to these three regions, but these were the main focus. Energy economics involves concepts such as energy and electricity consumption, energy financing and pricing, renewable energy as well as oil and gas issues. All these elements are closely associated with tourism. Renewable or sustainable energy has the considerable potential to accommodate substantial sizes of populations in emerging economies currently lack access to sustainable energy (Hasanuzzaman and Abd Rahim 2020). The assertion of a link between energy and tourism is evident in recent literature, for example, researchers Li, Gozgor, Lau and Paramati (2019) conducted a study to establish whether tourism investment improved energy efficiency in transportation and housing. Energy efficiency policies have had increasing safety measures in recent decades because of climate change (Li *et al.* 2019). Furthermore, energy efficiency policies can provide substantial benefits to economies as far as production processes are concerned by lowering carbon dioxide emissions (Li *et al.* 2019). As for the consumer, proper, efficient and effect energy policies would save the consumer considerable amount of money (Costa-Campi, García-Quevedo and Segarra 2015; Li *et al.* 2019). This is because the link between energy and tourism cannot be ignored as its research dates to more than two decades ago when Tabatchnaia-Tamirisa, Loke, Leung and Tucker (1997) examined the link between energy and tourism in Hawaii. It was imperative to review the association of energy and tourism for a destination such as Hawaii in this research as it is a major global tourism region.

The correlation between energy economics, more specifically oil and tourism are a fairly under-research phenomenon. GCC state leaders chose tourism as one of the main drivers for enhancing economic development and diversification (Mansfeld and Winckler 2007). Cities, like Dubai, known for their oil wealth are establishing themselves as major tourist attractions. This is most likely due to the fact that oil, one of its major exports is a non-renewable resource therefore providing the urge to diversity. One viable way of diversification is through tourism. For over four decades, the tourism industry has been regarded and recognised as a leading industry world-wide (Mansfeld and Winckler 2007). This therefore makes more imperative to ensure that energy consumption is conducive for this industry (*i.e.* tourism) to remain active and productive. Major tourist destinations such as Dubai (Frew 2008, Otgaar 2012). The figure below presents energy consumption in Hawaii, a major tourism destination over a 17-year period from 1999 to 2016.

Figure 1. Hawaii Consumption of Energy, By End-Use Sector: 1999 to 2016



Source: Department of Business, Economic Development & Tourism (2018)

Table 1. Hawaii Consumption of Energy, By End-Use Sector: 1999 to 2016

Year	Residential 1/ 2/	Commercial 1/ 3/ 4/ 5/	Industrial 1/ 4/ 5/	Transportation 1/ 4/	Electric power 1/ 2/
1999	32,4	36,0	78,0	123,1	106,6
2000	33,0	37,3	78,0	125,2	108,5
2001	32,2	36,6	69,5	132,0	105,3
2002	34,5	39,4	70,8	140,2	110,9
2003	31,8	37,5	68,8	162,9	102,7
2004	32,6	41,3	68,9	172,0	104,4
2005	33,3	39,9	72,4	179,1	104,1
2006	33,7	40,7	71,6	181,3	104,7
2007	34,1	40,2	69,0	194,4	105,7
2008	33,4	40,9	65,8	136,5	102,8
2009	33,3	40,7	69,1	133,0	100,3
2010	32,6	40,1	68,0	6/ 136,4	98,7
2011	6/ 32,5	41,1	6/ 67,5	6/ 144,4	98,9
2012	31,5	6/ 39,1	65,1	6/ 142,2	94,8
2013	30,9	40,6	6/ 65,4	6/ 141,7	92,3
2014	31,4	6/ 41,1	64,5	142,2	92,1
2015	31,8	6/ 41,4	6/ 64,2	6/ 145,8	91,6
2016	32,7	41,5	62,5	146,2	91,8

Source: State of Hawaii Department of Business, Economic Development & Tourism (2018)

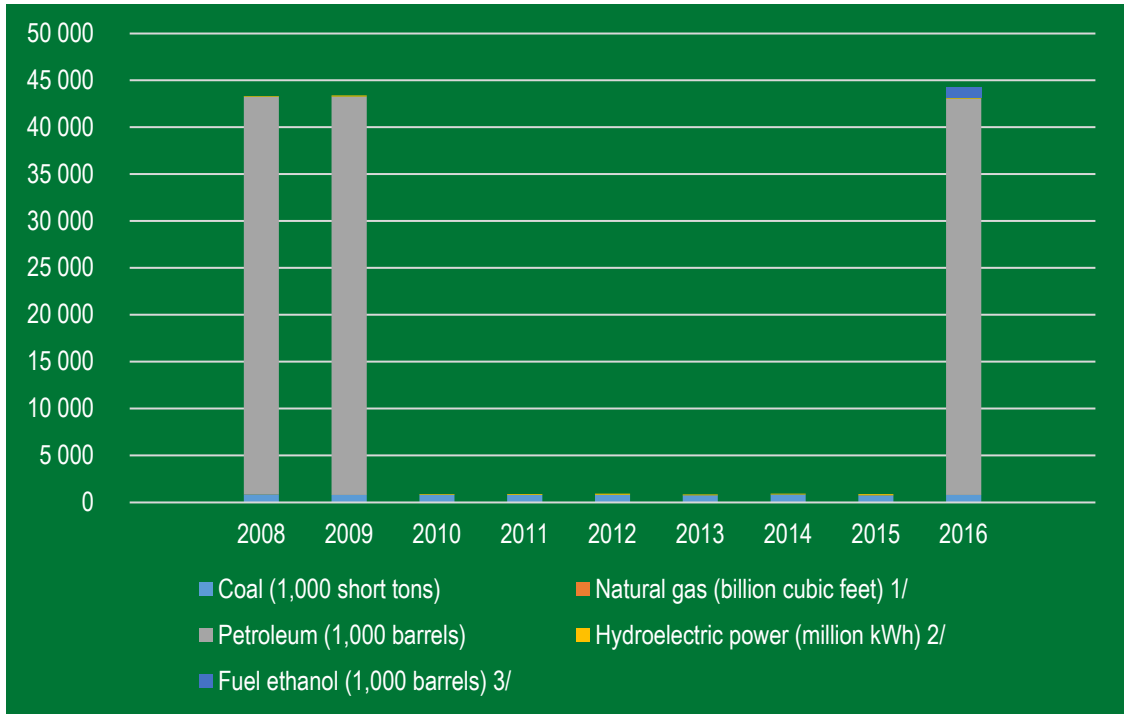
Table 2. Hawaii Consumption of Energy, By Source (Physical Units): 1960 to 2016

Year	Coal (1,000 short tons)	Natural gas (billion cubic feet) 1/	Petroleum (1,000 barrels)	Hydroelectric power (million kWh) 2/	Fuel ethanol (1,000 barrels) 3/
2008	840	3	42 397	84	4/ 930
2009	791	3	42 472	113	4/ 1,065
2010	803	3	4/ 42,754	70	4/ 804
2011	783	3	4/ 44,379	93	4/ 933
2012	803	3	4/ 42,770	115	4/ 847
2013	753	3	4/ 42,336	78	4/ 874
2014	831	3	4/ 41,974	94	4/ 953
2015	747	3	4/ 42,786	121	4/ 1,147
2016	787	3	42 246	91	1 152

Source: State of Hawaii Department of Business, Economic Development & Tourism (2018)

Figure 1 and table 1 present energy consumption levels in Hawaii over a 17-year period. The state has regular kept track of its residential, commercial, industrial, transportation and electric energy consumption levels. It can be observed that energy consumption has significantly dropped across all sectors, however, electric power still remains relatively high when compared to the other sectors.

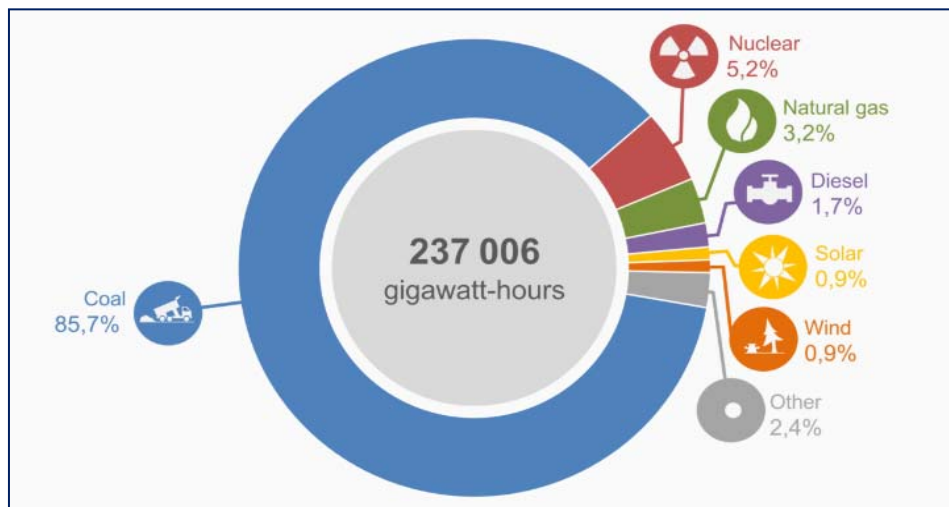
Figure 2. Consumption of Energy, By Source (Physical Units): 1960 to 2016



Notes: Y axis represents Petroleum (1,000 barrels) while X axis represents years  
 Source: State of Hawaii Department of Business, Economic Development & Tourism (2018)

Figure 2 and table 2 present energy consumption levels in Hawaii over an 8-year period. The state has saw a major decline consumption of petroleum consumption over much of the period. The other forms of energy consumption are almost non-existent over the same period. However, petroleum use after 5 year low picked once again. Such results and efforts in constant recording of data re-enforces the importance of energy to travel regions such as Hawaii. The last of the three tourists' regions assessed is in the following section. South Africa, another popular tourist region is assessed in terms of its energy consumption. The data is presented in Figure 3, which is then followed by a discussion.

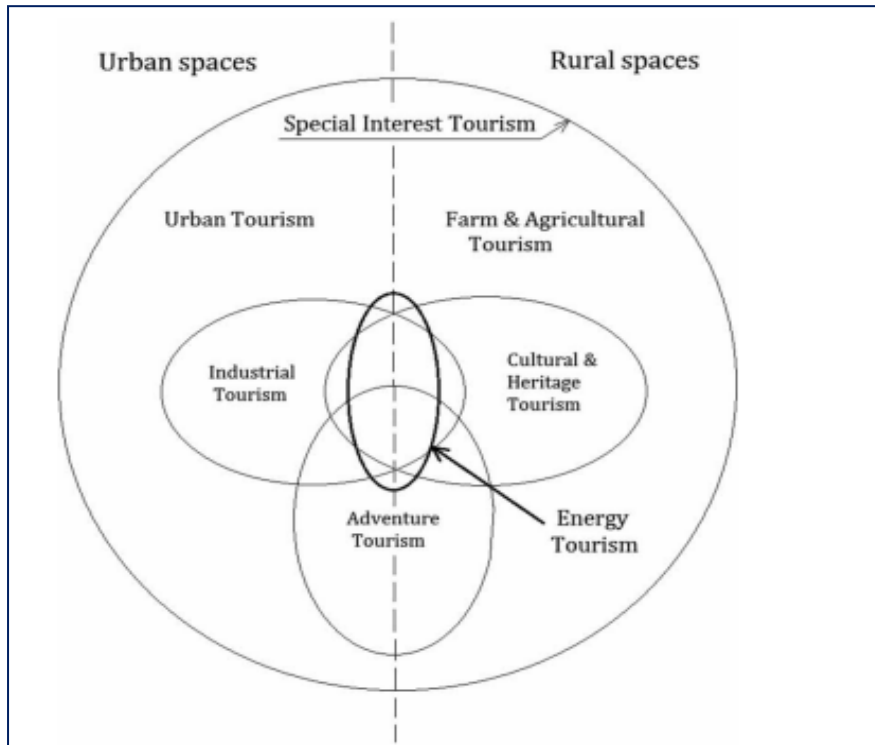
Figure 3. Energy use in South Africa



Source: Statistics South Africa (2019)

Figure 3 presents energy consumption in South Africa as of 2019. The main energy source is coal accounting for 85,7% of all energy generation while, nuclear account for 5,2 % and nuclear 3.2. Surprisingly, diesel is only responsible for 1.7% of energy generation. The remaining sources barely register which are solar, wind responsible for 1. 8 combined. However, other miscellaneous energy sources were recorded to account for 2.4%. Below in figure 4, the relationship between energy and tourism is presented.

Figure 4: Interrelationships of energy tourism and other types of special interest tourism



Source: Adapted from Frew and Shaw (1995) and Frantál and Urbánková (2017)

Figure 4 above presents how energy tourism overlaps other forms of tourism. The other forms of tourism are mainly affected by energy tourism are industrial, adventure and cultural and heritage tourism. This continues to show the extent to which tourism is affected by energy economics. The research methodology employed, and data sources are presented in the following section.

Developing an ideal community energy strategy is dependent on numerous conflicting objectives in terms of capital costs, energy savings and environmental effects (Karunathilake, Perera, Ruparathna, Hewage and Sadiq 2018). Some energy initiatives across the world have made the connection between energy and tourism thus contributing to the discussion of how energy economics impact tourism? The Green Lights Program between Green Lights Partner and the United States Environmental Protection Agency (USEPA) advocates for effective low energy lighting (Li *et al.* 2019). In addition, to this Li *et al.* (2019) suggested that the policymakers, government officials, travel agencies, and other key players in the tourism industry should recognise and appreciate the substantial benefit of the tourism investments and use of renewable energy for the ultimate conservation of energy (Li *et al.* 2019). Energy is a key resource for sustainable development of any country, whether it is for social, economic or environment reasons (Rathor and Saxena 2020, Suganthi and Samuel 2012). Energy management is crucial for future global economic growth, advancement and protection of the environment (Suganthi and Samuel 2012). Energy is closely tied to industrial production, agricultural produce, health products, water, people, education (Suganthi and Samuel 2012). This therefore makes it important for organisations such as those in key industries that include tourism to priorities energy management and efficiency. It is reported that the industries take up to 29% of the global energy demand, which is why it is crucial to effectively manage energy consumption (Fawkes, Oung and Thorpe 2016; Balbis Morejón *et al.* 2019).

The predicted saving potential resulting from effective energy use in the industrial sector is projected at around 20% of the energy consumption, equivalent to 974 million tonnes of oil equivalent (Chan and Kantamanen 2015; Fawkes *et al.* 2016). There are three fundamental approaches to implementing energy efficiency industry (Abdelaziz, Saidur and Mekhilef 2011), namely energy management, introduction of new and more efficient technologies or implementation of automatic operations. (Balbis Morejón *et al.* 2019). These efforts can greatly

advance through supportive Government policies and regulations (Balbis Morejón *et al.* 2019). Energy and tourism are closely connected which then gave rise the phrase “Energy tourism”. Energy tourism is intertwined with other types of special interest tourism, namely cultural and heritage, agricultural and adventure tourism (Karunathilake *et al.* 2018). Energy is a critical resource in ensuring the functioning of a modern society (Karunathilake *et al.* 2018; Suganthi and Samuel 2012). Energy is closely associated with tourism and effective approach of the other has a direct effect on the other. Constantly, trying to understand consumers’ needs therefore becomes crucial (Venter, Chuchu and Pattison 2016). Energy tourism refers to visits by travellers to old, no longer-in-use, or regenerated sites, as well as to still active energy sites where some facilities, services, or activities have been provided solely for the use of tourists. The following section discusses the relationship between energy and tourism through reviewing energy economic practices of three popular tourist destinations, Dubai, South Africa and Hawaii.

## 2. Methodology

The research relied on secondary data sources relating to two aspects of interest, energy and tourism. In order to obtain enough material established databases were utilised for searches and these include Ebsco, Science direct and Emerald. The words, “Energy” and “Tourism” were entered in the databases papers were screened for their appropriateness and contribution. Official government websites were also used for obtaining relevant tourism and energy statistics. The focus was on papers from the years 2000 to 2019, none the less seminal papers prior to this period were included where it was deemed appropriate. The approach in presenting this study’s information was based on providing the authors, journal of publication, and problem under investigation. In addition, the methodology, key findings a proposed future research. The table 3 below presents the interrelatedness of tourism and energy.

Table 3. Tourism, Consumer behaviour and Energy

Source	Problem & Main objective	Method	Finding & Future Research Potential
Çora, H and Mikail (2020)	To understand global patterns associated with energy economics	Review	Long-terms consumption changes are necessary to reduce environmental pollution and global warming.
Bhat and Prakash (2009) in <i>Renewable and sustainable energy reviews</i>	To assess renewable based electricity generation technologies against a range of sustainability indicators using data obtained from the literature.	Quantitative secondary data sources	It has been found out that wind and small hydro are the most sustainable source for the electricity generation.
Karunathilake <i>et al.</i> 2018	Research on community level energy planning and propose an innovative framework for approaching renewable energy at a community level.	Scenario-based study	Results showed that a higher share of renewable sources in the energy mix does now lower GHG emissions.
Balbis Morejón <i>et al.</i> (2019)	To assess the main issues affecting the electricity efficiency and productivity of the lead acid battery formation process.	Quantitative utilising regression analysis	The influence of the operational practices and the technical conditions of the formation circuits were identified as the main factors affecting the productivity and the electricity consumption.
Mansfeld and Winckler (2007).	Examined reasons for GCC governors	Qualitative	Tourism could contribute to the economy of gulf oil countries, but it

Source	Problem & Main objective	Method	Finding & Future Research Potential
<i>Tourism Economics</i>	identify tourism as a major catalyst for stimulating economic growth and diversification		remains risky due to increased dependency of foreign labour it causes.
Buckley and Hanieh (2014). <i>International Journal of Urban and Regional Research</i>	Examined diversification by Dubai and the Gulf through major real estate developments	Qualitative based on secondary data	Further examination of Dubai's 'diversification by through urbanisation is encouraged.
Tabatchnaia-Tamirisa <i>et al.</i> (1997) <i>Annals of Tourism Research</i>	Investigated the link between tourism and energy	Quantitative using secondary data	The increase of tourist influx into Hawaii is predicted to exponentially spike the rise of energy consumption in the destination.
Li <i>et al.</i> (2019) <i>Environmental Science and Pollution Research</i>	To investigate whether tourism investment improves energy efficiency in the transportation and residential sectors?	Quantitative, using secondary data	find that both the foreign direct investment inflows and trade openness play a considerable role in reducing energy uses across these sectors

Source: Author's own work

## Conclusion

This paper was an attempt to highlight the link between oil, a major element of energy economics with tourism. The Gulf region was an area of interest due to its drive towards oil diversification through tourism as a viable income generating source. Dubai most notably is seen to have received significant growth through its major real estate projects that have attracted much tourism investments. Several policy implications emergence from the review of literature and assessment of existing data. The first implication is for policy makers which suggests the importance of not relying on a single source of economy driving resource such as the case of oil rich states and regions. Dubai is an example; efforts were put in place to support the already thriving oil industry by introducing an active tourism industry in the city-state. This suggests that countries with large oil bases should consider alternative income generating programmes before oil reserves eventually get depleted. This implication remains true for major tourism nations and regions that need to survive. For example, this study reviewed popular tourist destinations such as Hawaii in South Africa. It is clear that the two destinations would benefit immensely from energy savings schemes that would intern release pressure both environmentally and financially so as to focus on further tourism development. Findings from literature provided sufficient evidence to suggest that the success of the tourism industry is dependent on effective energy policies. The impact of energy on tourism is a phenomenon that cannot be ignored. None the less is evident as this may be this area of study remains poorly documented and left open for debate in many instances. This then calls for more in-depth analysis and review of data on energy-tourism relations.

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