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project proposal

092

_the opportunity of the new:

'In doing a memorial I started with a room and a garden. That was all I had. Why did I choose a room and a garden as a point of departure? Because the garden is a personal gathering of nature, and the room is the beginning of architecture. The garden has to do with nature as it applies to a place that has been chosen by man and is developed for man's use in a certain way. The architect becomes the advocate of nature, and makes everything in the deepest respect for nature. He does this by not imitating it at all, and not allowing himself to think that he is a designer - if he imitates how, let us say, the bird plants the tree. But he must plant the tree as man, a choosing, conscious individual. The room is not only the beginning of architecture' it is an extension of self. ...The large room and the small room, the tall room and the low room, the room with the fireplace and the room without, all become great events in your mind. You begin to think, not what are the requirements, but rather what are the elements of architecture that you can employ to make an environment in which it is good to learn, good to live, or good to work. Also marvellous in a room is the light that comes through the windows of that room and that belongs to the room. The sun does not realise how wonderful it is until after a room is made. A man's creation, the making of a room, is nothing short of a miracle. Just think, that a man can claim a slice of the sun.' **[Louis Kahn,. From Between Silence and Light by Joh Lobell, [1979]. Reprinted by arrangement with Shambhala Publications, Inc., 300 Massachusetts Ave., Boston, MA 02115.]**

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Glass
The recycling of glass benefits the environment. According to a Glass Recycling company one glass bottle is sufficient to power a 100W glass bulb for up to an hour.
[www.theglassrecyclingcompany.o.za

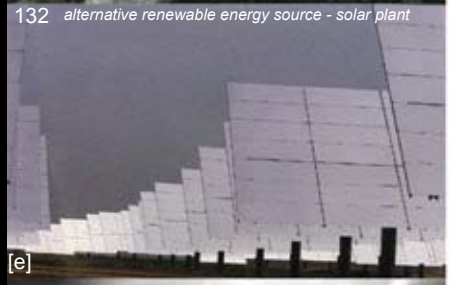
Uniross - rechargable batteries
Replacing disposables with rechargeables will eliminate 333 000 tonnes of waste worldwie.
I has up to 30 times less impact on ozone pollution,
28 times less impact on climate warming, 9 times less impact on air acidification and consume 23 times less non-renewable natural resources, fossils and minerals.
One pack replaces 93 packs of disposables.

Paper
For each ton of paper that is recycled we can save 17 pine trees and three m2 of landfill space, reduce air emissions in paper making by 70% and use 40% less energy, which translates to enough electricity for 512 homes for an entire year.
[Paper Recycling Association of South Africa, www.paperpickup.co.za, www.sappi.co.za, www.nampak.co.za]

093 [a] *green cities of the future*

[b] *Al Gore*

132 *alternative renewable energy source - solar plant*



[e]

publications prompting society to change their views

[d]

[f] *non-renewable fossil fuel energy*

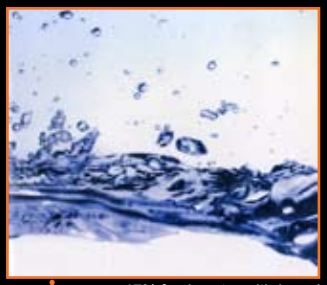
urbansprout

[g] *hybrid cars - the face of the future*

[h] *recycle + re-use*

contributors to a 21st century green society

THE BUILDING INDUSTRY CONTRIBUTES TO NATURAL RESOURCE DEPLETION



17% fresh water withdrawal

25% wood harvest

33% of the CO2 emissions

"Green" sustainable living is the hot new topic in many fields, from politics - Al Gore, to fashion, to the building industry. Buildings, being one of our heaviest consumers of natural resources, have a responsibility to ensure that the built environment contribute to a turnaround in global warming. According to the US Green Building Council [USGBC]:*" ...buildings account for 17% of fresh water withdrawals, 25% of the wood harvest, 33% of the CO2 emissions and 40% of material and energy use."* To prevent further degradation of our planet, sustainable building practices need to be adopted. This led to the emergence of the green building, backed by scientific research, this approach can hold a promise for the future, having an ecological footprint, measuring the consumption of natural resources against the ability of the planet to recover from the activities depleting its natural supplies. The measurement is indicated by the amount of productive land area needed to support and sustain such human activity. We've now exceeded the earth's biocapacity to recover from excessive consumption by more than 25%, increasing the ecological stress. Key resources and services taken into account are food, fiber, timber, land for development, and vegetated land to absorb carbon dioxide release from burning fossil fuels. With organisations voicing the way to go about it, into the mainstream, [LEED, U.S., BREEAM, U.K., and Green Building Council of Australia], setting guidelines to pin down what it means, a platform is given to speak to an attentive audience.

There are many different measures which can be taken to design a more resource efficient building. When a building qualifies as a efficient design, it can reduce operating costs by increasing productivity and using less energy, and ultimately - reducing their impact on the environment.

GREEN DESIGN VERSUS SUSTAINABLE DESIGN:

What is a sustainable design?
"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"
[Brundtland commission, 1987]

Sustainable designs sustain functions of energies, its flexible, endures and function when nonrenewable energies are unavailable.
It consists of three main components, illustrating the interdependence of the elements, community [social], economy and ecology. [fig.]
They act as three spheres, illustrating their spatial relationship, depending on the connectivity critical to sustainable design, and requires dimensional solutions.

*"A green building is one that is energy efficient, resource efficient and environmentally responsible. It is a building which "significantly reduces or eliminates its negative impact on the environment and its occupants "***[Green Building Council of Australia].**
"Such a building can reduce energy consumption by as much as 70%, while having a dramatic impact on greenhouse gases and climate change."
[Green Building Council of South Africa].

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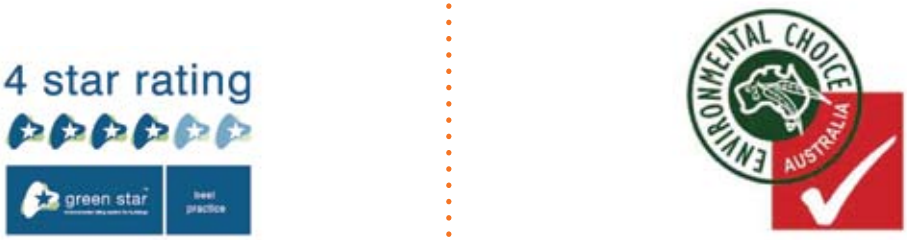

"Australia, like other countries around the world, is facing an immense challenge - to create sustainable cities for the future. As one of the most urbanised countries in the world, with water shortages, transport congestion and high energy demands, Australia must take action now to address how our cities might develop in the future."

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Its an element of sustainable design, incorporating ecological sensitive materials, efficient systems and high-performance technologies to create healthy buildings with strategies for addressing:

1. *energy efficiency;*
2. *greenhouse gas emission abatement;*
3. *water conservation;*
4. *waste avoidance, re-use and recycling;*
5. *pollution prevention - noise, water, air, soil and light;*
6. *enhanced biodiversity;*
7. *reduced natural resource consumption;*
8. *productive and healthier environments; and*
9. *flexible and adaptable spaces.*

_green building practices:

The goal is to achieve a building with the lowest possible ecological footprint, to minimise its effect on nature and the environment. To restore some of the energy it uses and function as an entity on its own. Minimising its reliance on government's forms of energy use.

By considering the following when a green building is developed, this objective can be achieved:

- **Location** - avoid fragile landscaping, near mass transportation, not contributing to urban sprawl.
- **Site planning** - use less surface water, indigenous landscaping, create more green space
- **Building** - orientation, facade treatment
- **Exterior** - use alternative energy systems, green roofs, use natural light and minimise glare
- **Interior** - use recycled materials and renewable resources, flexible layouts, occupant controls heat and light, abundant natural light and fresh air.

site planning

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alternative energy systems

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facade treatment

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In order to establish an internationally recognised rating system for South Africa, co-ordination and consistency from the relevant government party's and departments are needed to make the implementation of such a system efficient and effective [fig. 097]. The system needs to be reinforced by the building code of South Africa, to enable the building industry to set minimum environmental standards for future projects. For further support, these new building regulations should be recognised internationally as a South African labelling for materials, and lastly a range of green building educational programs will increase the uptake of green building practices in South Africa. On a social level, some of these strategies are already in place. A few Green building conferences have been held over the past years, but its a costly exercise to gain the knowledge and to apply it. This issue needs to be addressed to ensure the successful implementation of the system in South Africa.

_benefits:

Saving energy and water usage [quantifiable]

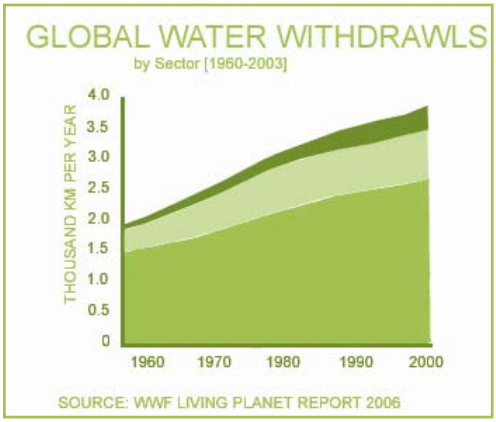
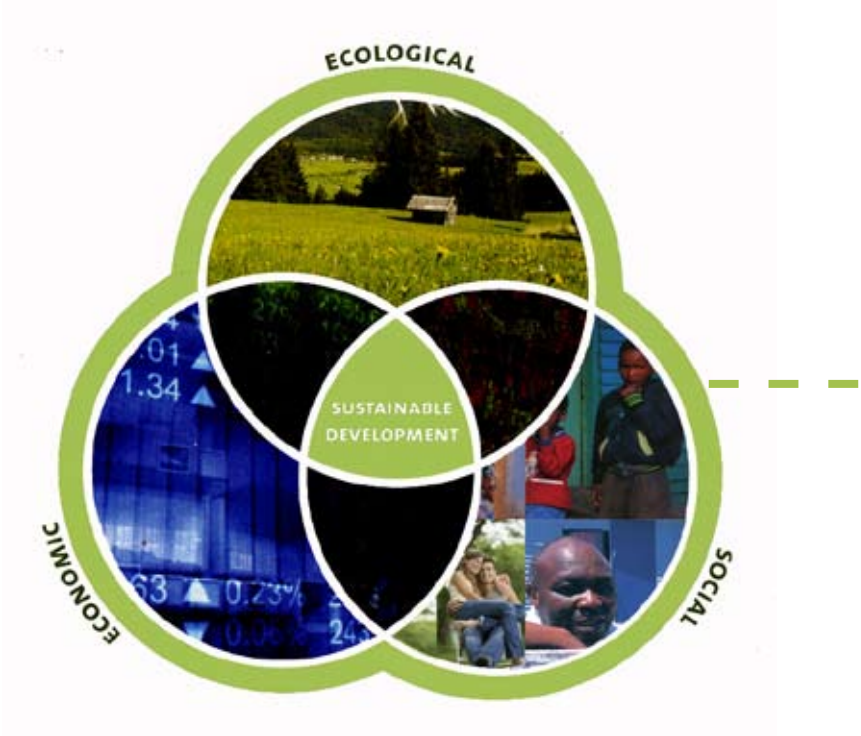


Figure 095: Improved indoor environmental quality, which relates to improved occupant satisfaction, wellbeing and productivity.

Environmental - beyond dispute deliver a suite of compelling economic and social benefits that conventional buildings do not.



_problems:

- A major barrier is the perceived cost
  Lack of industry skills
- Cost and availability of green products and materials
- Cheap pricing of water and energy [starting to change]
- Lack of incentives for demonstrating best practice
- Conflicting government regulation

Figure 096: Three main components, illustrating the interdependence of the element

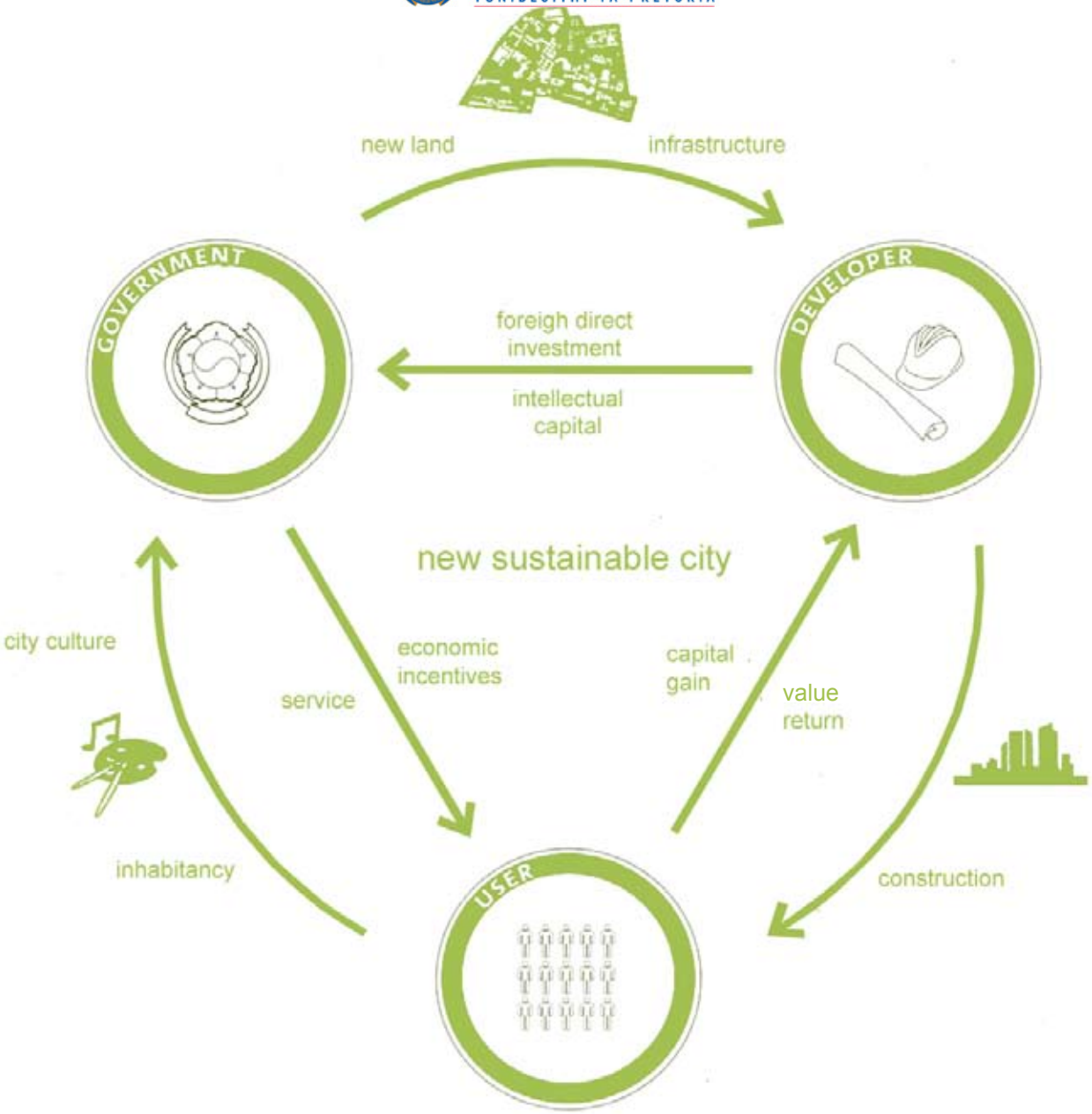


Figure 097: the strategy to follow to ensure a successful new sustainable city

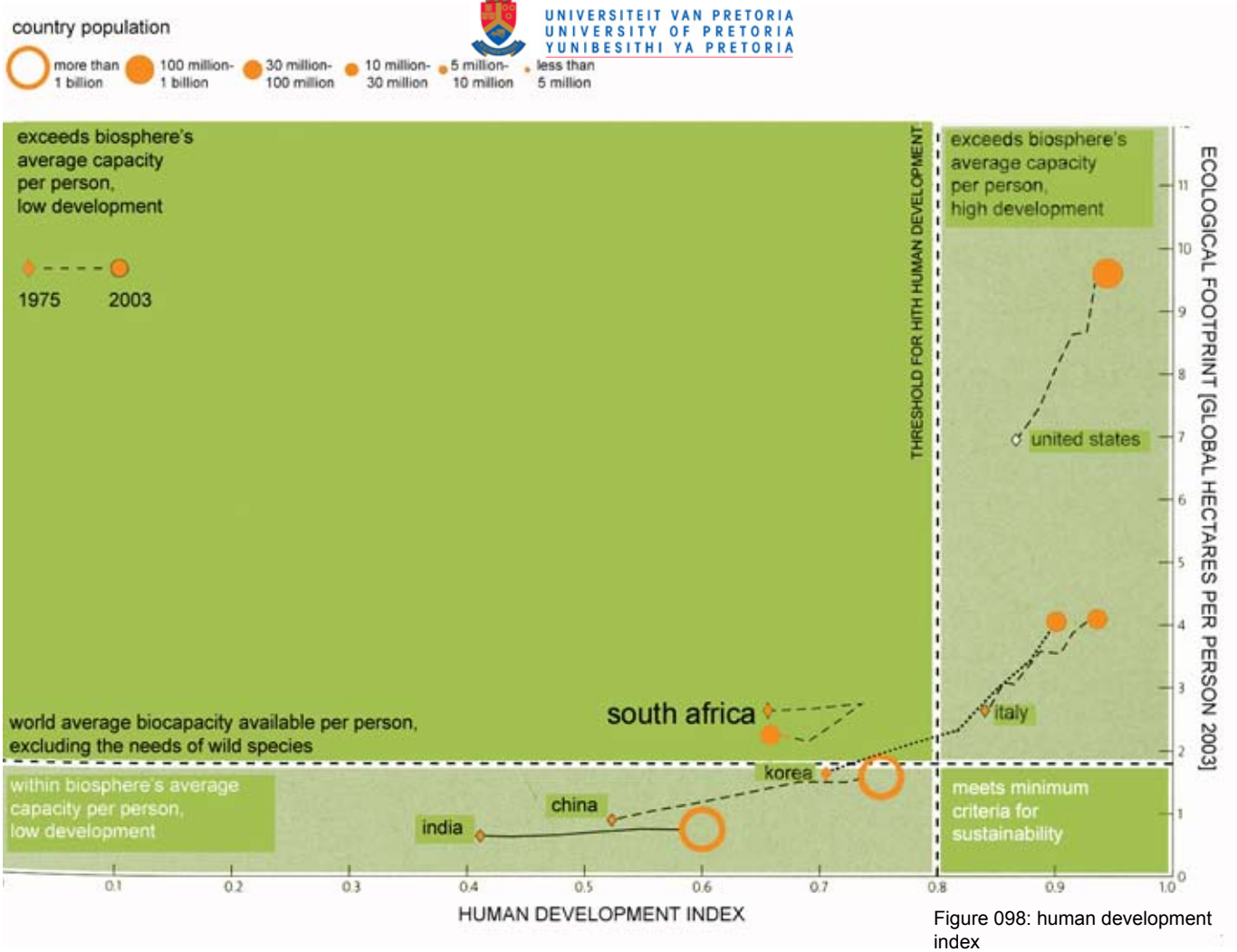


Figure 098: human development index

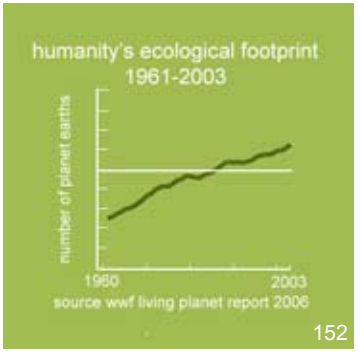


Figure 099: more stress on our natural resources is a direct result of rapid population growth [figure 100]

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1950
20,356,000

2007
49,044,790

population

1960
520

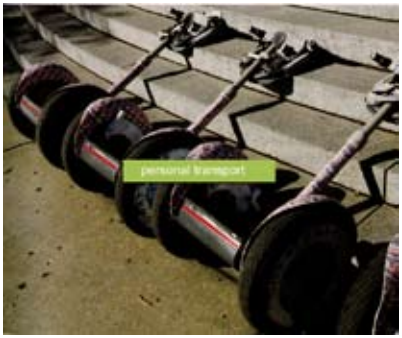
2000
13,300

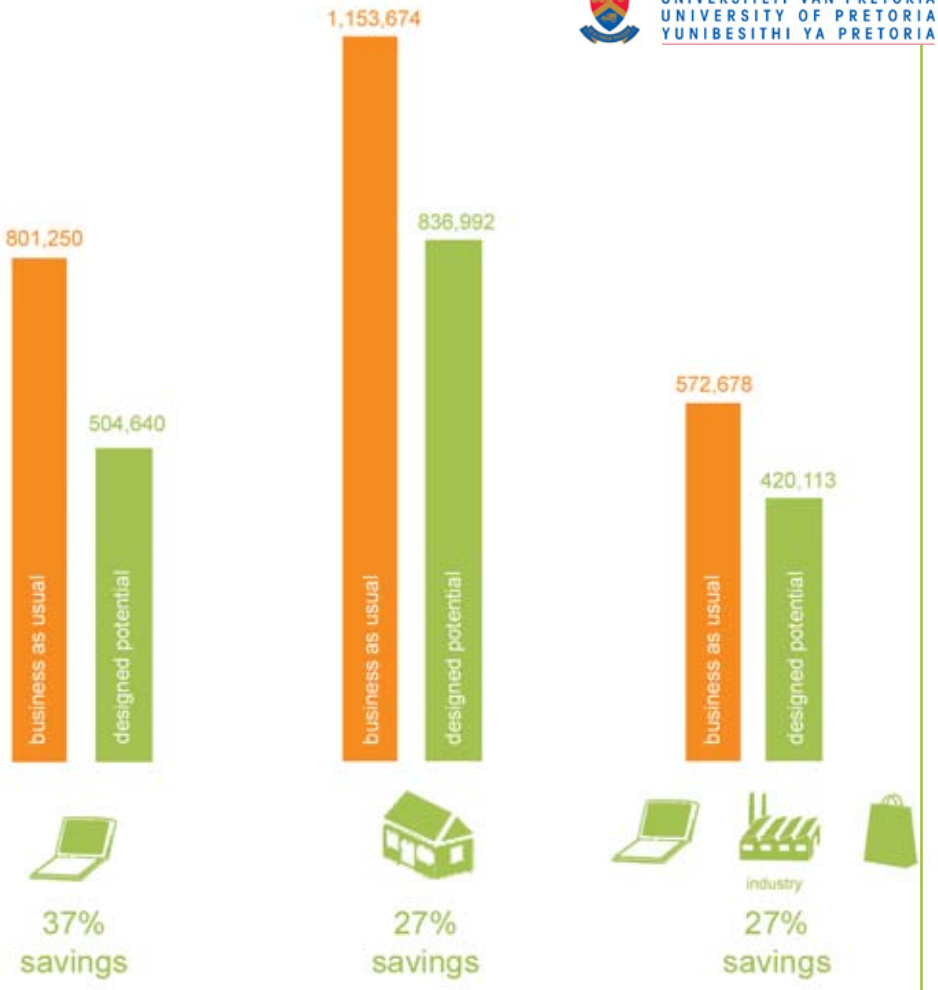
GDP per capita

1980
1.7

2001
8.1

energy consumption





_burdens of the modern city

Worldwide, more people live in cities than on rural land. Almost half of the South African population is concentrated in these metropolitan areas. According to the UN-HABITAT 2006 Annual Report, an estimated 93% of global urban growth will occur in Asia and Africa. This rapid growth increases water and air pollution, increasing our burden on the already scarce energy resources. Therefor, specific guidelines need to be incorporated into city developments to ensure a vibrant, healthy city, functioning as a sustainable city.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client

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CSIR
our future through science

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_client profile

The client profile consists of two parties; The University of Pretoria [UP] and The Council for Scientific and Industrial Research [CSIR]. Both parties specialize as research facilities and have the financial and technological resources to assist the proposed programme.

The CSIR functions as a leading multi-disciplinary research and technological innovation facility. Constituted by an Act of Parliament in 1945, its main site is situated in Pretoria. As experts on many fields, including the build environment, they aim to create a better future through science. Knowledge is generated through research activities by means of technology and skilled personnel.

The CSIR has clients in both the private and public sector. They foster partnerships and network organizations as part of a global sphere of influence on matters of technology. The CSIR has strong emphasis on relevant and developmental work in various communities and institutions as a funding agency.

STRIKING A CORD

It's a brilliant idea: a power strip that lights up to show how much electricity your gadgets are using.

DESIGNED TO REINVENT THE WHEEL

Even renowned designer Zaha Hadid still goes to the office sometimes. Her hydrogen-powered, three-wheeled, two-seater concept has an adjustable suspension that raises and lowers the cabin, depending on driving conditions.
www.zaha-hadid.com

_the University of Pretoria

The University of Pretoria's offers the prospect to a new, interdisciplinary vision, focussing on creativity and innovation as the art of creative problem-solving. Its an international credible tertiary facility with state-of-the-art facilities. A creative 'capital' with ample innovative thinkers whose ideas can be turned into valuable products for the future, focusing on the emerging of technology and design. Via cutting edge research and development in engineering, the built environment and information technology, the traditional intellectual processes can be stretched beyond the normal narrow confines. Shifting the focus to problem solving; enabling the students to develop their skills and to better themselves.

The University of Pretoria is committed towards promoting innovative technology, as it resembles growth and prosperity. In a world in which the nature of global conflict shifted from a military focus to an economic one, it's becoming increasingly important to adopt the notion of competitiveness on a national- and international level. The University offers the student the opportunity within an educational medium, to reach the essence of innovation - renewal and continuous improvement. A powerful skill, driving competitiveness, fuelled by creative energy.

user

LIFE CYCLE - RHYTHM - ROUTINE - RE-CURRENT - PROCESS - ENERGY-FLOW - RENEW - RECLAMATION - DYNAMIC - CIRCULATE MOTION.

LIFE CYCLE - RHYTHM - ROUTINE - RE-CURRENT - PROCESS - ENERGY-FLOW - RENEW - RECLAMATION - DYNAMIC - CIRCULATE MOTION.

education

experiment

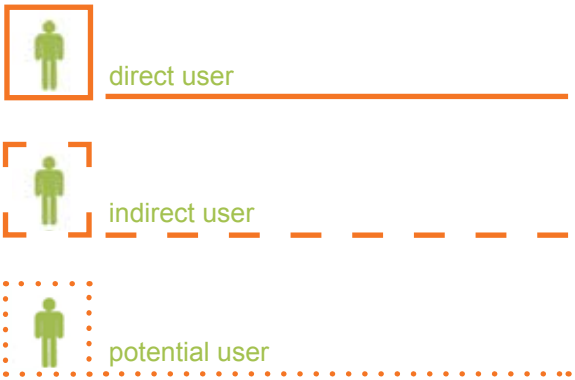
awareness

innovate

integration

interaction

LIFE CYCLE - RHYTHM - ROUTINE - RE-CURRENT - PROCESS - ENERGY-FLOW - RENEW - RECLAMATION - DYNAMIC - CIRCULATE MOTION.



_three categories of users can be identified:

the direct user - this category addresses students qualifying for their post graduate degree [honour, master or doctorate] using the facility for educational purposes. This user will occupy the facility on a daily basis, making use of all the available facilities within the centre;
the indirect user - this category applies to all students of the University of Pretoria, using the public amenities within the building, merely as social gathering space or a circulation node through which to reach their end-destination;

the third category includes *potential users* of the city [the public, primary and high-school children, other institutions]. These users will only have access to all the facilities, if the user is registered as a public member of the facility. If not the user only qualifies to participate in the public amenities within the centre. The main focus is to increase this category of users, to spread the word on the specific topic and to assist the public with guidelines on how to create a sustainable living within a post carbon city.

The proposed project should allow easy access and distribution of the information researched within the centre, to ensure the advanced innovative technology doesn't remain behind closed doors, but shared with the public, ensuring a thorough integration between the facility and all its users. Continual participation will contribute to achieve the point of connectivity between the two parties. The activities provided and generated should encourage the user to participate in the proposed programme.

_types of activity:

The proposed facility will cater for different outdoor activities for its various users, to establish the facility as a vibrant point of connectivity on the campus. To generate energy, connecting flows as a nucleus of interaction.

According to Jan Gehl, the user profile can be divided into three types of outdoor activities:
_the necessary activities which occur independently of the facility;
_optional activities as a result of favorable exterior conditions. This category can be enhanced through thorough planning and design of the exterior spaces to encourage these optional activities to happen in and around the building.
_lastly, the social activities, active or passive which results in conjunction with the first two activities.
[Gehl, 1987:p. 11]

"It is also possible to create sensibility by improving the human ability to perceive the environment...One may educate users to attend to their environment, to learn more about it, to order it, to grasp its significance"
[Lynch, K. 1981: p, 147]