ENVIRONMENTAL PLANNING AND LAW CLASS PROJECT

Professional Advice concerning the 'Broadway Road' Project in regards to the discrepancy between the legal definition of, and matter of fact sustainability

1. ***Number of Words: 2273***
2. ***Date of Submission:*** 5th of June, 2009
3. This report has been printed on recycled paper and bound by a single staple

Nicholas Saunders
Student ID – 10594202
05/06/09
Ecological Foot print – 12 Ha

Table of Contents

Introduction

For the sake of this report, the project area has been considered as an island, required to sustain the current and expected future demands of the population living and working in the designated project area. The pros and cons of this decision will be discussed within the report. The 'Broadway Road' project area is defined as the section of Broadway between City road and Harris Street including the road, footpath and the buildings fronting the road, including vacant blocks, residential flats, U.T.S and commercial offices and retail premises (Appendix 1). The project area and falls within the City of Sydney Local Government Area (Appendix 2).

Sustainability as a matter of fact differs from sustainability as a matter of law and is not to be confused; as such, for the purpose of clarity, advice on each issue will be provided separately.

Sustainability as a matter of Law

The legislation currently in place is designed to support and promote the principles of Ecologically Sustainable Development (ESD). Clause 6(2) of the *Protection of the Environment Administration Act* 1991(POEA Act) describes the four principles of ESD which must be considered by local councils, or the Minister of The Department of Planning if a development is proposed that exceeds 50 million dollars, when assessing development applications. This process is designed to mitigate the potential for any development to cause 'serious or irreversible damage to the environment'. The 'business as usual' use of cement, black surfaces such as tar, and the growing, transport and consumption of food within the project would be assessed within this framework.

It is important to note that the *Environmental Planning and Assessment Act* 1979 (EP&A Act) adopts the principles of ESD defined in the POEA Act, so it is to be assumed that when this report references ESD, the EP&A Act is also being referenced.

As the current scope of the law only applies to new developments, one could argue that the 'Broadway Road' project area is already in compliance with the current legislation. The current legislation in N.S.W doesn't require any individual or company to change their situation to achieve sustainability as a matter of law or fact. Once a development is approved the merits of the design of that development are no longer under the scrutiny of the law.

Never-the-less, achieving sustainability as a matter of law is not a clear-cut case. Whilst the law has in essence a defined set of principles which are required to be followed in order to achieve sustainability (as a matter of law), the manner in which these principles are imposed on developments is dependent on several factors. The 'Broadway Road' project area includes residential, commercial, and Local Government Buildings and the University. Developments within each area are subjected to different assessment and regulation under the EP&A Act.

In regards to water and energy usage within the project area, the Building Sustainability Index (BASIX) energy and water reduction targets, which are stipulated in the *State Environmental Planning Policy (SEPP) (Building Sustainability Index: BASIX) 2004* and amended in the *SEPP (Building*

Sustainability Index: BASIX) Amendment Policy 2005, are only applicable to developments listed within *SEPP (BASIX) 2004 Reg 6*, namely residential developments, both single and multi unit, exceeding $50,000.

BASIX energy and water reduction targets are as follows; a 1 – 40% reduction of potable water usage (dependent on the developments location)and an average of 36% reduction of green house gas emissions. (BASIX, 2009)

Commercial developments are not legally required to meet the BASIX water and energy targets. Furthermore, BASIX does not apply to Government activities (*EP&A Act 1979 Pt5*) such as the road and footpaths within the project boundary.

The EP&A act 1979 therefore poses no restriction to the current 'business as usual' approach in relation to the usage of black tar or cement in the creation of foot paths or roads within the project area as these activities are carried out by the Local Government.

A chief principle of the EP&A Act is the precautionary principle, the application of which is triggered by the satisfaction of two conditions. Firstly, the threat of 'serious or irreversible damage to the environment' due to a proposed development, and secondly, scientific uncertainty as to the environmental impacts of that development.

In regards to the 'Broadway Road' project area, and applying the procedure of application of the precautionary principle as outlined in the *Telstra Corporation Limited v Hornsby Shire Council [2006] NSWLEC 133* case; should it be deemed that a proposed development within the project area could pose the threat of 'serious or irreversible damage to the environment' and if there was scientific uncertainty as to the environmental impacts of that development; the burden of proof would fall upon the developer (paragraph 150). That is, the developer would be required to prove that the deemed 'serious or irreversible damage to the environment' does not exist or is negligible. Herein lies the key. Whilst the benefit of doubt is given to environmental protection when scientific proof is lacking, the fact is that application of the precautionary principle does not need to necessarily result in the halt of all development (paragraph 179). Preston CJ Brown of the Land and Environment Court N.S.W is quoted as saying 'some risks are plainly acceptable and others are plainly unacceptable' (paragraph 157). In essence, the proportionality of the response of the law must be on par with the potential threat to the environment that the development poses (paragraph 166).

Whilst the merits of the Minister's decision were not being tested, the *Drake-Brockman v Minister for Planning and Another [2007] NSWLEC 490* case indicates that if it can be proven that the principles of ESD have been considered by the Minister during the approvals process, at least to some degree – no matter how small, a development can be approved without being subject to the assessment process outlined in the *Telstra Corporation Limited v Hornsby Shire Council [2006] NSWLEC* 133 case.

Development applications denied by the Minister however, cannot be reconsidered.

In conclusion, the use of cement, black surfaces such as tar, and the growing, transport and consumption of food within the project will not be controlled or assessed consistently by the EP&A Act. Whilst assessment under EP&A Act clearly aims to reduce environmental degradation which could occur as a result of new developments, due to the fact that;

1. BASIX targets are not required to be met by all genres of new development
2. Developments exceeding $50,000,000 can essentially bypass the typical environmental assessment process
3. The current legislation allows developments which are knowingly harming the environment (albeit out of necessity)(paragraph 157, *Telstra Corporation Limited v Hornsby Shire Council [2006] NSWLEC 133*)
4. End of pipe solutions such as the water tanks in proposed design for the re-vamp of the UTS Blackfriars complex are enough to gain development approval and result in a development essentially being deemed sustainable as a matter of law.
5. There is no restriction to the current 'business as usual' usage of black tar or cement in the creation of foot paths or roads within the project area as these activities are carried out by the Local Government.

It is clear that achieving sustainability as a matter of law in no way achieves sustainable development as defined by Brundtland Report; '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*.'

The impact of the current trends of power and water usage (Appendix 6 & 9), and the effect of a 'business as usual approach" to the use of cement, black surfaces such as tar, and the growing, transport and consumption of food within the project will be discussed in the second part of this document – "Sustainability as a matter of fact".

Sustainability as a matter of fact

Human activity has have increased the concentration of Green House Gases (GHG) in the atmosphere from between 260 and 280 parts per million (ppm) to 380 ppm in recent times; climate change is the result. GHG absorb heat leaving the earth and return some of it, increasing the earth's ambient temperature (Appendix 10). (Dept. Water, 2009)

As a matter of fact, cement production is the third largest single contributor to manmade climate change (Michael Mobbs, 2009). Black tar has a low albedo rating (Appendix 5) and therefore contributes to the green house effect by trapping heat during the day and re radiating it at night, as well as increasing energy usage attributed to indoor climate control. (Dept. Water, 2009)

This increase in temperature has had a drastic effect on the ability for human beings to sustain themselves. It is projected that the world's grain production will fall by 10% by 2030 (Appendix 16) due to the phenomenon that is climate change. The world's current resource consumption levels have surpassed the sustainable yield threshold – a situation which is only being exasperated by climate change and increasing populations. (Bourne, 2009)

When the project area is viewed as an island, it is possible to quantify what it would take to make the area self sustainable in terms of water, food and energy requirements.

In regards to energy, a typical home uses about 7,300 kilowatt hours (KWh) a year (Energy Australia, 2009). Assuming a population of 2500 in the project area, consisting of 1000 households 7,300,000 kWh of energy is required by the residential population annually. Doubling this figure to allow for the university, traffic and street lights as well as commercial premises energy requirement for the project area = 14,600,000 kWh.

On average a 1kW solar power system could generate up to 1,400kWh per year, therefore, with 104289 1kw solar panels, the project area could have energy efficiency. This is obviously not plausible for financial and space limitations. (Energy Australia, 2009)

Following on, in regards to the projects water requirements, If the population of the area is assumed to be 2500 and the average person in the project area consumes 151 litres of water per day (Appendix 7) the project area needs to self supply 137787.5 KL of water annually to be self sufficient. As the annual average stormwater runoff within the project area is assumed to be to 169680KL (estimated project area X average annual rainfall) it is plausible that the project area could provide a sustainable water supply to the local inhabitants if the majority of rainfall was captured and useable (i.e. un contaminated). This is however unlikely without on-site water treatment systems as a large amount of the catchment area on the 'Broadway Project" site is the black tar road; water taken from this source is likely to be polluted.

One must take into consideration however that the project area's population is not static, it is increasing exponentially (Appendix 3 & 4) so the ability for the 'Broadway Road' project area to maintain a sustainable source of water and energy at a current 'business as usual' level of consumption is as such in a constant state of decline.

It must be noted that the environmental impacts that occur in the production and distribution of the goods and services we buy and consume far overshadow our direct household impacts. (ACF, 2007)

That is to say that even if the Broadway project area were able to sustainably supply itself with energy and water, goods such as food (and their transportation) make up a large proportion of the area's ecological footprint, and as such it's environmental impact (Appendix 11). An ecological footprint illustrates the amount of land required to sustain an individual or area. On average Australians have one of the largest ecological footprints in the world at 6.4 ha. (ACF, 2007)

Reduction of the project area's ecological footprint by using combinations of appropriate technologies however, could allow the project area to be considered sustainable as a matter of fact. Examples include:

- Solar Power
- Co and tri generation systems (Appendix 14)
- Water Recycling to reduce potable water requirements
- Roof top gardens for food production

Statistically, these systems are unlikely to be implemented on a large scale due to the financial burden that many of them pose (Appendix 12). Polluter pay policies and regulations would dramatically improve the uptake of these technologies.

Considering the project area as an island is helpful when ascertaining what it would take to make the area sustainable but is also intrinsically erroneous. The fact of the matter is that the 'Broadway Project' area's ability to sustain itself is unfortunately eternally linked with the activities of the rest of the world.

Whilst:

All with varying targets

- The city of Sydney has set targets for GHG and water usage reduction as part of the 2030 vision (Appendix 8)
- UTS has set also reduction aims (Appendix 13)
- residential developments are subject to the BASIX legislation,

Unless targets are consistent and achieved on a global scale sustainability as a matter of fact is an unattainable ideal. An individual's environmental impact is clearly linked to resource use. Resource use is also intrinsically linked to economic growth. As such, as the economies and buying power of individuals (especially in developing nations) inevitably grow and mature so does the potential for further environmental damage on a global scale and an increased greenhouse effect. (Figure 15) (Beder, 1994)

Threat of serious or irreversible environmental damage as a matter of fact but not of law?

The reality is that even if the project is sustainable as a matter of law, it will probably not be sustainable as a matter of fact. The threat of serious or irreversible environmental damage exists simply by not making the project sustainable as a matter of fact. The reality is that our current consumption levels of energy and water already exceed the sustainable yield thresholds for these resources (ACF, 2007)(Appendix 6).

The threat of serious or irreversible environmental damage as a matter of fact but not of law poses no legal obligation for an engineer to reduce the environmental impact of a development. Knowingly causing serious damage to the environment however, could incur future liabilities, both professional and legal. It would be advisable to get legal advice to reduce any future liabilities associated with the environmental damage.

Current social conscience is environmentally concerned, and as such, so too may be some developers. Provide developers with several design options, both to the letter of the law as well as over and above the norm in terms of reducing the ecological footprint of a development. Dependent on the size and nature of developments, environmentally friendly development can be cost effective given good design.

References

- It is assumed that all data taken from fellow students reports is correct. The reports of Abdul Anwari, Giancarlo Papaoanni, Kalyani Patkunarajah and Stanley Phillips were referred to when completing this report.

- Australian Conservation Foundation 2007 (ACF, 2007), ' *Consuming Australia: Main Findings'*, Centre for Integrated Sustainability Analysis at the University of Sydney
  www.acfonline.org.au
  Accessed 3 June 2009

- Australian Conservation Foundation, *'NSW Government fails BASIX test'*
  http://www.acfonline.org.au/news.asp?news_id=819&c=133728
  Accessed 1 June May 2009

- Beder, S. 1994, '*Sustainable Development: Costing the Earth?'*, Engineering and the Environment, 23rd conference – Illawarra Regional Group, Institute of Engineers Australia, Sydney

- Bourne, J. 2009, *'The End of Plenty'*, National Geographic, June 2009, Vol 215, No. 6

- Department of the Environment, Water, Heritage and the Arts, *'Households and Climate Change'*
  http://www.environment.gov.au/settlements/gwci/households.html
  Accessed 27 May 2009
  Referenced in text as (Dept. Water, 2009)

- Energy Australia, *'How much will you save?'*
  http://www.energy.com.au/energy/ea.nsf/Content/NSW+Solar+Energy+Save
  Accessed 1 June May 2009
  Referenced in text as (Energy Australia, 2009)

- The NSW Government Department of Planning, '*Basix – Building Sustainability Index, Basix Fact Sheet'*
  http://www.basix.nsw.gov.au/information/common/pdf/basix_fact_sheet.pdf
  Accessed 2 June May 2009
  Referenced in text as (BASIX, 2009)

- The NSW Government Department of Planning, *'Basix – Building Sustainability Index, Basix multi-unitlooks like'*
  http://www.basix.nsw.gov.au/information/common/pdf/sustainable_feat_multi.pdf
  Accessed 24 May 2009

Appendices

Figure 1 - 'Sustainable Broadway Project' Area

Figure 4 - Population trend in Chippendale

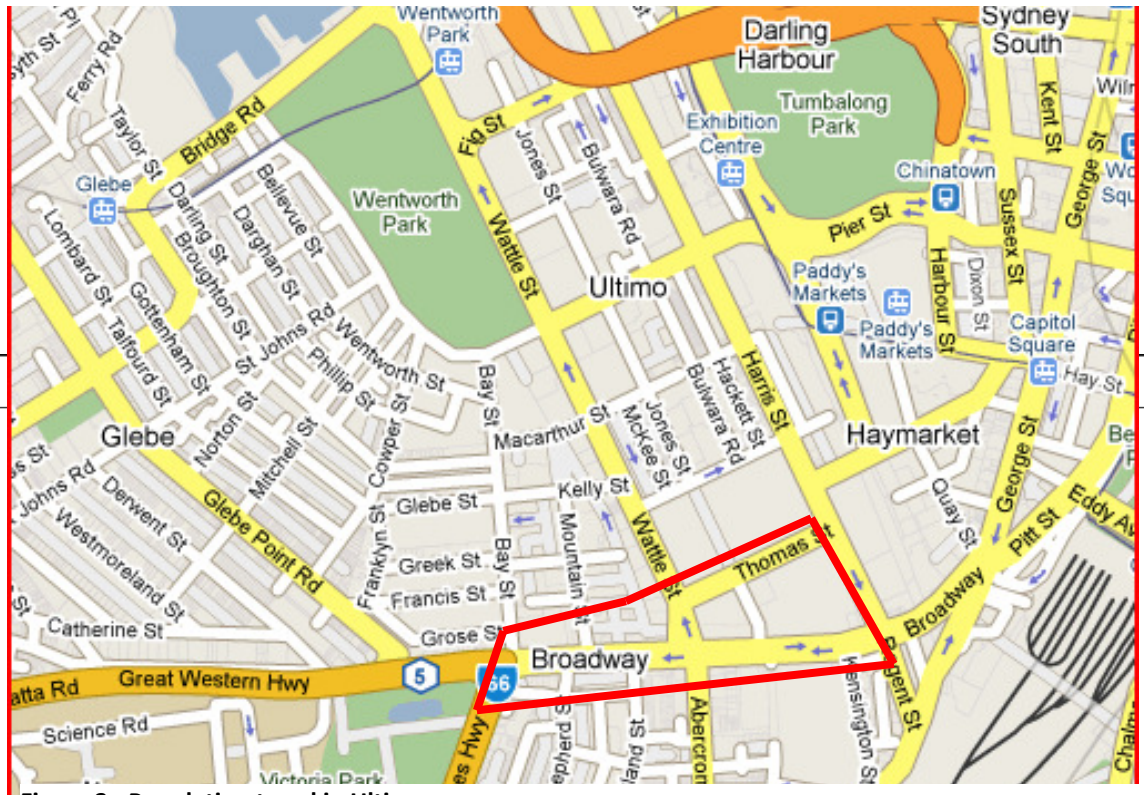

Figure 3 - Population trend in Ultimo

Figure 2 - 'Sustainable Broadway Project' Area overview

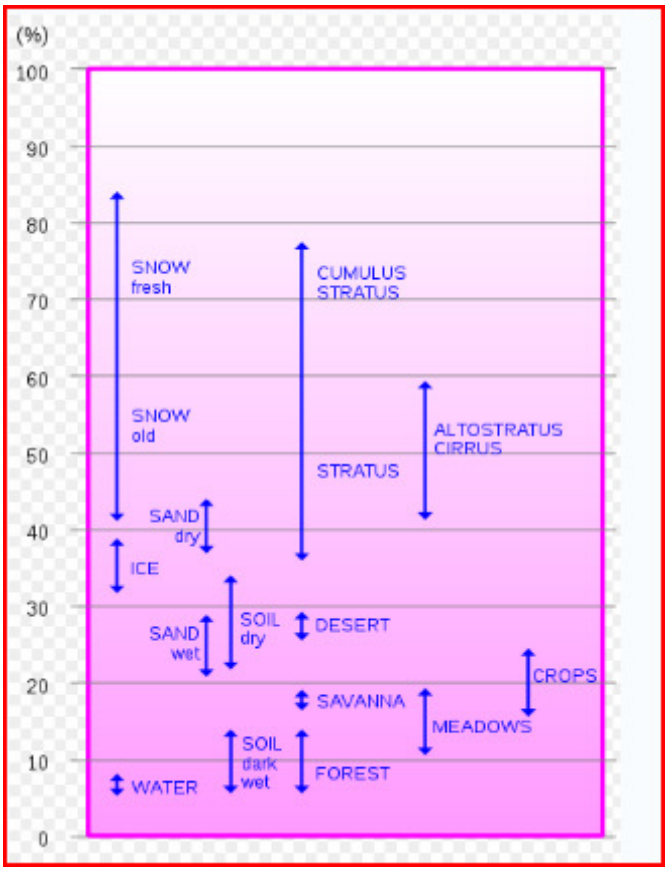

Figure 6 – Albedo % comparison of different materials

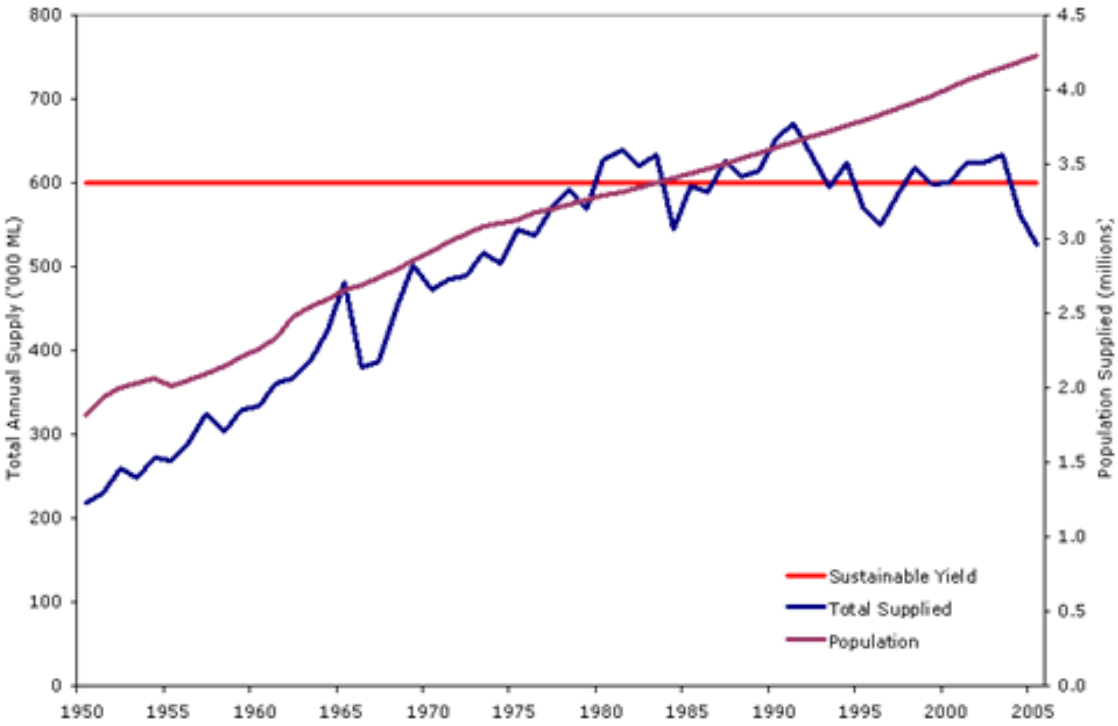

Figure 5- Sydney water consumption trend graph showing sustainable yield

Sustainable Yields and Water Consumption in Australian Cities

City	Current Population [1] (000s)	Current Total Consumption [2] (ML/yr)	Current per Capita Consumption (kL/yr)	Sustainable yield [3] (ML)	Projected Population in 2030 [4] (000s)	Approximate year when consumption exceeds Sustainable Yield [5]	Per Capita Consumption required in 2030 to stay within Sustainable Yield (kL/yr)
Adelaide	1 077	178 380	166	185 000 [6]	1 115	2030	166
Brisbane	905	165 353	183	165 000 [7]	1 326	*2003* [8]	124
Canberra	346	56 148	162	84 000	398	2070	211
Gold Coast	454	57 850	127	62 000 [9]	790 [10]	2007	78
Melbourne	3 470	479 215	138	564 000	4 263	2024	132
Newcastle	489	76 852	157	73 500	580	*2003* [8]	127
Perth	1 426	212 244	149	276 000 [11]	2 060	2026	134
Sydney	4 198	634 742	151	600 000	5 115	*2003* [8]	117

1 The total population receiving water supply services in 2002-03, as reported in WSAAfacts 2003.
2 The total water consumption for residential, commercial, industrial and other uses in 2002-03, as reported in WSAAfacts 2003
3 Information supplied by relevant utility.
4 Base data is from Australian Bureau of Statistics, with the exception of data for Gold Coast, Newcastle and Perth, which was provided by the relevant utility.
5 Assuming consumption levels remain constant at 2003 levels.
6 Due to variability in rainfall, Adelaide currently has a sustainable yield of 50 000-60 000ML. In addition, SA Water has a 5-year rolling allocation of 650 000ML from the Murray River. This equates to an average of 130 000ML a year which provides an overall sustainable yield of approximately 185000ML. It should be noted, however, that the 650 000ML allocation does not need to be divided evenly between the five-year period - for example 174 000ML was used last year - so long as the 650 000ML limit is not exceeded. The potential also exists for SA Water to purchase additional water through trading, so the sustainable yield provided is really only a theoretical figure.
7 The Brisbane Sustainable Yield value equates to the master meter volumes supplied to Brisbane from SEQWater, with a 1% risk of depletion
8 Figures in italics denote areas where consumption has already exceeded the sustainable yield. Exceeding the sustainable yield does not mean that the city has run out of water, but that the security of supply for the city is reduced. This is likely to result in restrictions which are more frequent and of longer duration.
9 The Gold Coast sustainable yield is based on a historical simulation of rainfall from 1889-2003 with no failure (ie 100% reliability) and no restriction being invoked. It should be noted that the bulk supply obtained from SEQWater/Brisbane’s Wivenhoe Dam System will increase in the future.
10 The projected population figure for the Gold Coast is only for the resident population. Water demand is also influenced fairly significantly by the highly fluctuating visitor population which is predicted to be 98 000 in 2030, with significant increases on this experienced at peak periods.
11 The current system yield of the Integrated Water Supply Scheme (supplying Perth, Mandurah, small south west towns and the Goldfields and Agricultural Water Supply Scheme) is estimated at 335 000ML per year. By 2030, the demand on the Integrated Scheme from the areas other than Perth is estimated to rise to 59 000ML per year, leaving a yield of 276 000ML for Perth. This figure may be further derated if the flow regime of the last seven years - where inflows to metropolitan surface water sources have been 30% below the average of the last 29 years - continues and is adopted as a new planning base.

Figure 7 - Sustainable yield and water consumption in Australian cities

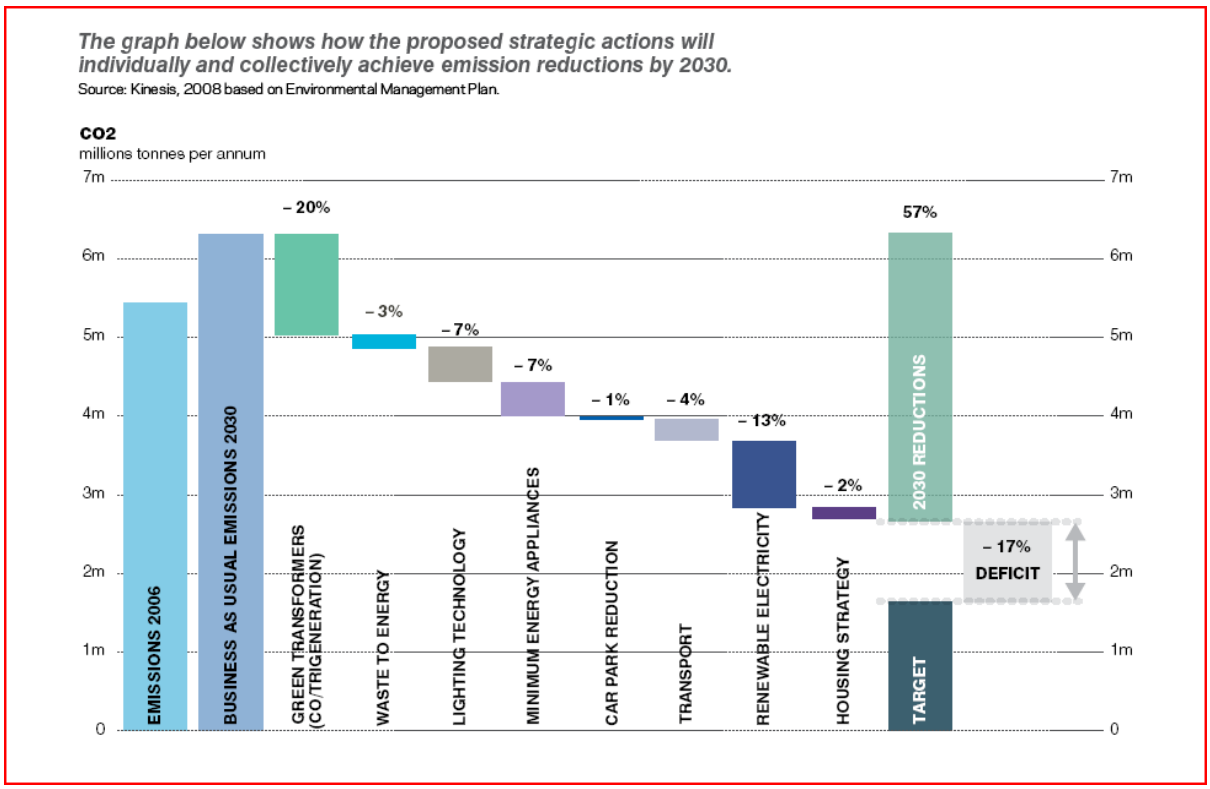

Figure 8 - 2030 vision GHG reduction aims

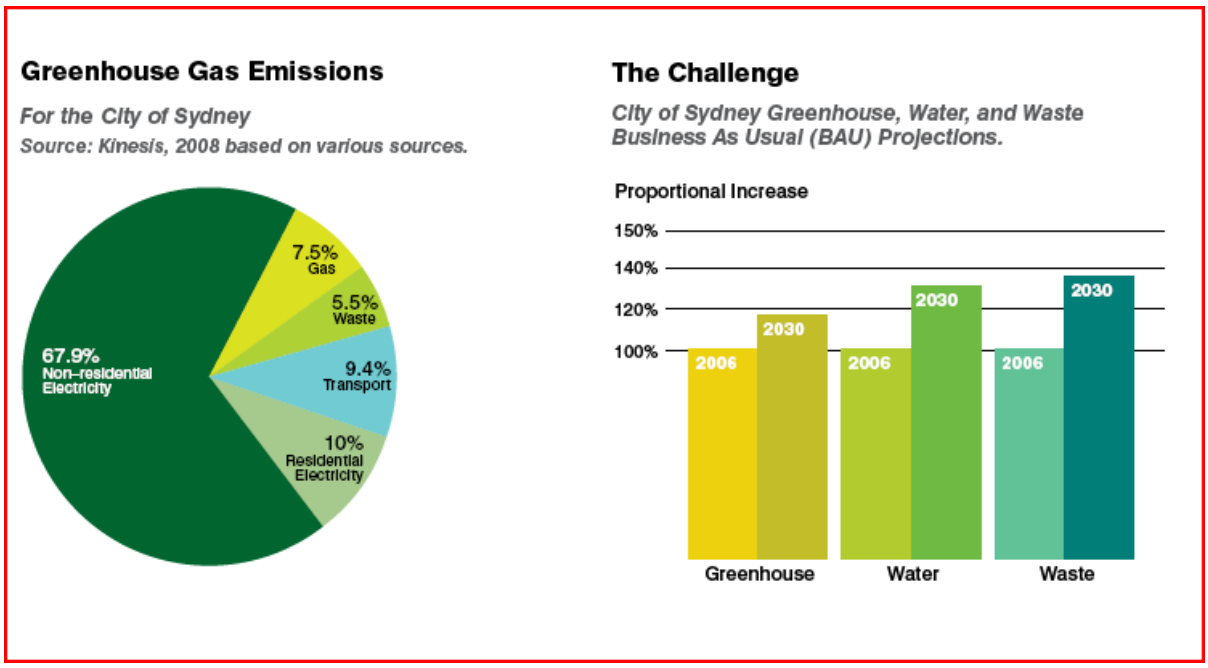

Figure 9 - 2030 'business as usual' projections

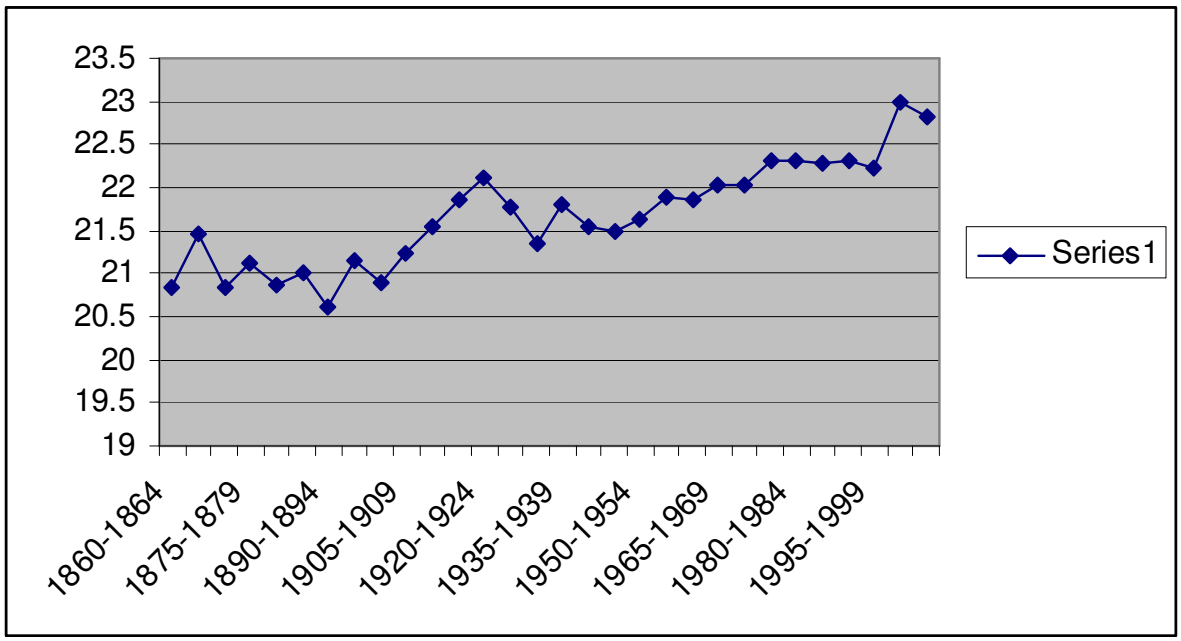

Figure 8 - Temperature Trend Graph

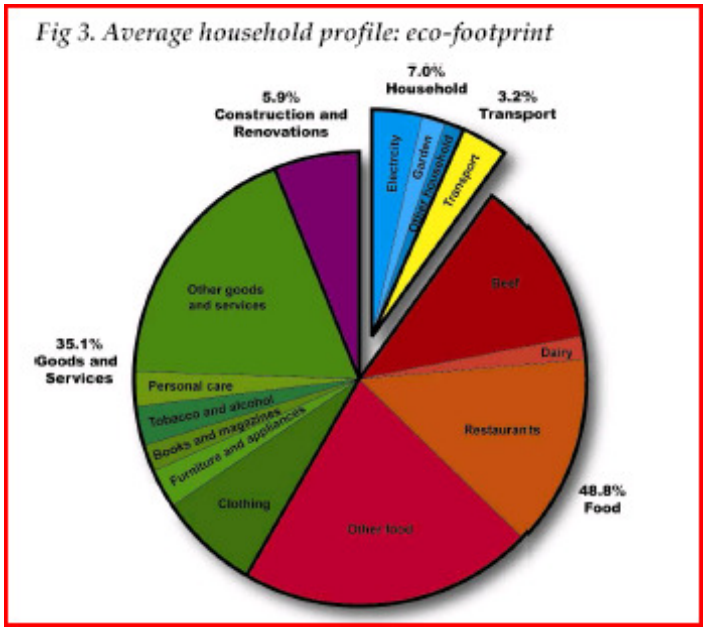

Figure 9 - Average Household Eco Footprint profile

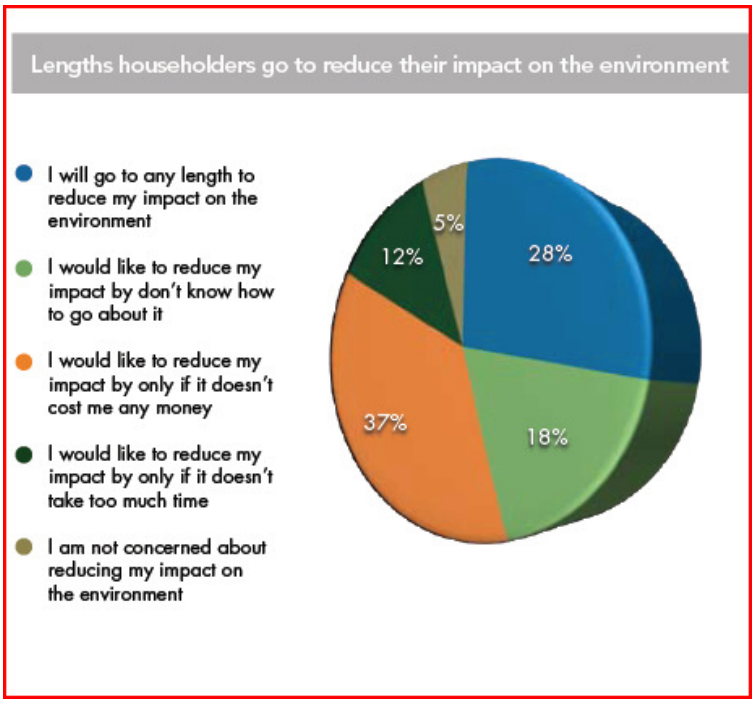

Figure 10 - lengths households go to reduce environmental impact

Category	Reporting indicator	2007 objectives	2007 performance	2008 targets
Energy (EN3)	Direct energy consumption by primary energy source (mejajoules per square metre)	820 MJ/M²	770 MJ/m²	780 MJ/M²
Water (EN8)	Total water withdrawal by source (kilolitres)	To reduce water consumption by 20% by 2010 compared to 2002 baseline (246.6kl)	Have now achieved 18.5% (45.6kl) water reduction from 2002 baseline (246.6kl)	To progress towards reducing water consumption by 20% by 2010 compared to 2002 baseline (246.6kl)
Water (EN10)	Percentage and total volume of water recycled and reused	To investigate water reuse and recyling options	No water recycled as yet; potential water re-use from cooling tower purge system identified	To implement a water reuse project with the potential to save 3% of UTS's general water consumption per annum
Waste (EN16)	Total direct and indirect greenhouse gas emissions by weight (tonnes of carbon dioxide equivalent)	To undertake measurement and documentation of UTS's greenhouse gas emissions	57,076 tCO_2*	–
Waste (EN22)	Total weight of waste by type/disposal method	To investigate options for reducing general waste to landfill and to reduce skip bin waste to landfill	General waste recycling reached 80% in 2007 90% of paper and cardboard sent to recycling was processed (250 tonnes) Skip bin waste recycling increased from 0% to 80% from September 2007, including building materials, furniture, timber and metal	Maintain 80 % recycling of general waste and 90% recycling of paper. Maintain 80% skip bin recycling rate Investigate toner cartridge recyling and mobile phone recycling

Figure 11 - UTS reduction Targets

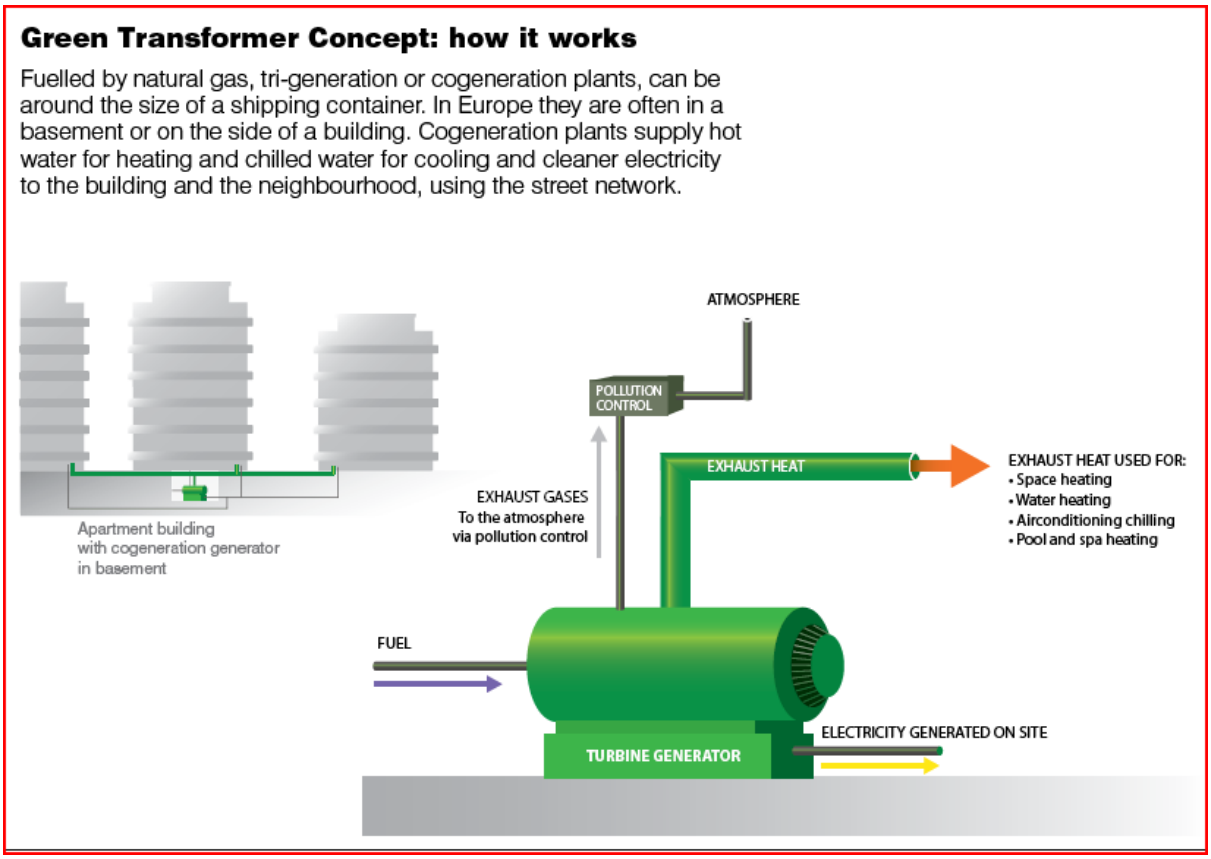

Figure 13 - Green Transformer concept

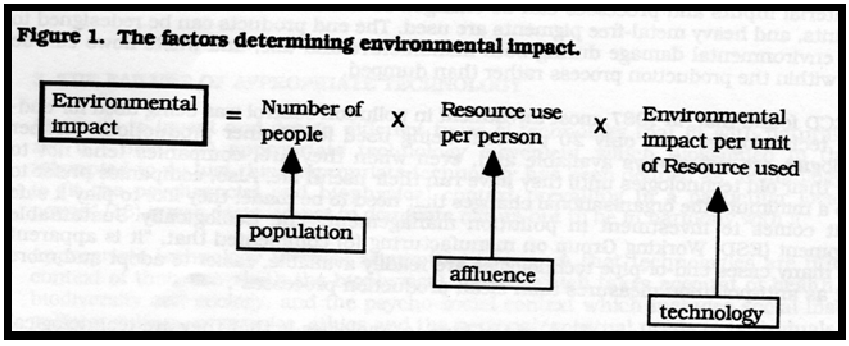

Figure 12 - Environmental impact and affluence relationship formula

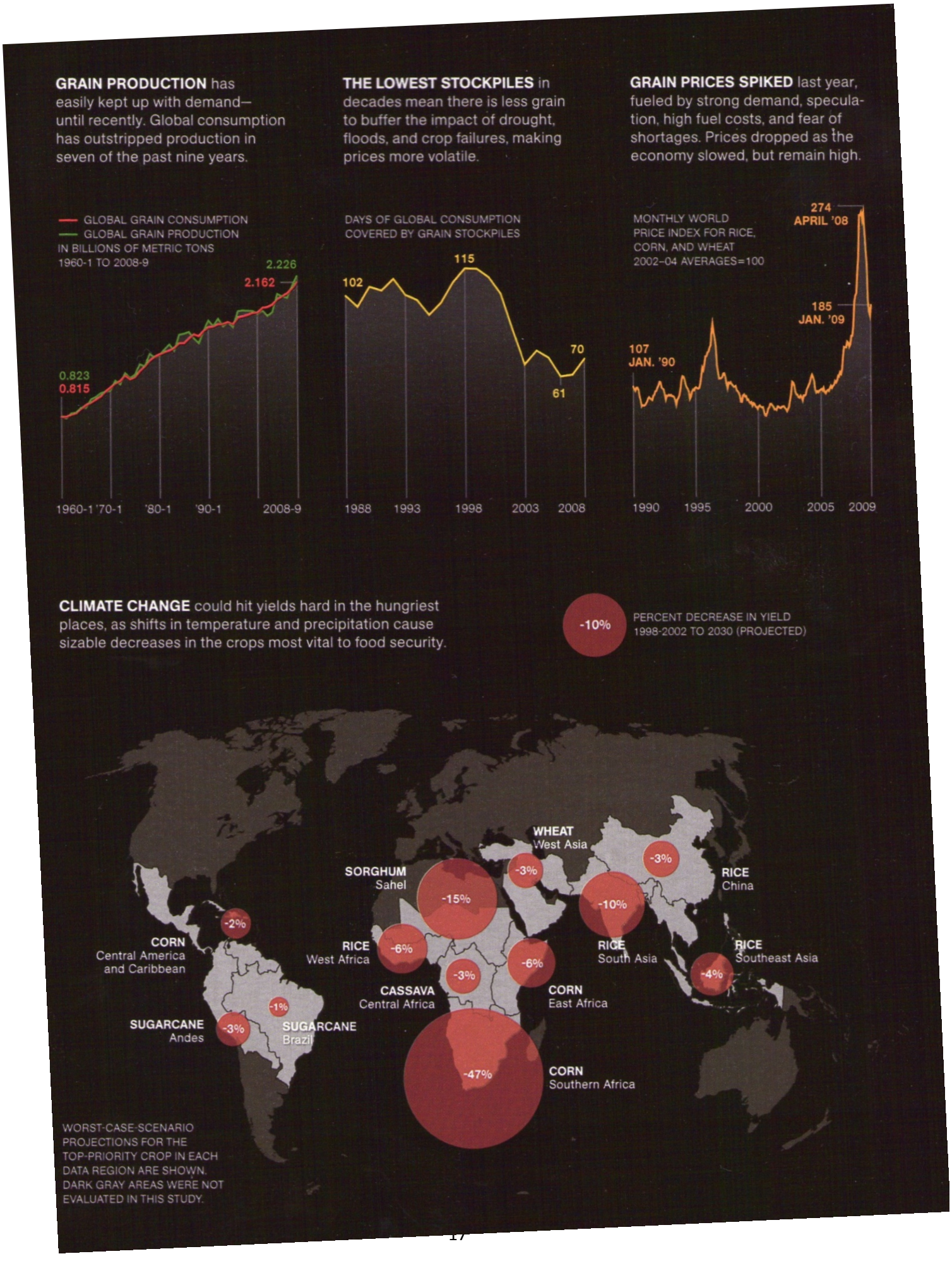

Figure 14 - World grain production and climate change relationship graph