

Achieving Sustainability in the Built Environment

Education, and Culture Change

TRANSITIONS TO SUSTAINABILITY

THURSDAY, 2 DECEMBER 2010

Professor David A Hood FIEAust CPEng

Chairman, Australian Green Infrastructure Council

National Deputy President, Engineers Australia

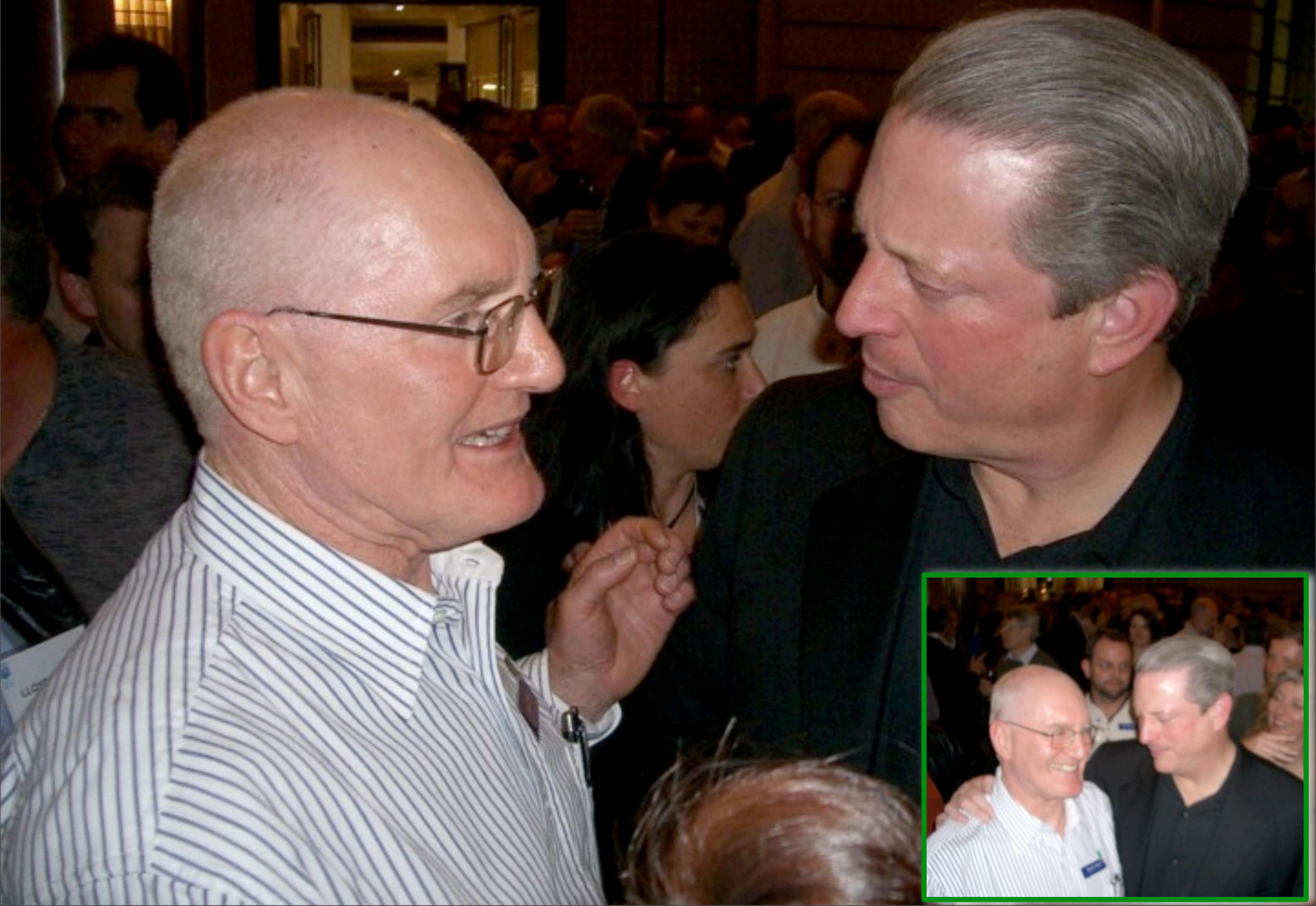
Adjunct Professor, Faculty of Built Environment and Engineering, QUT

Past Chairman Australian College of Environmental Engineers

David A Hood & Associates Pty Ltd



It helps to have good friends...



A CEO's statement to me:

“We don't need that energy efficiency stuff in our building design, because electricity is so cheap here...”

How would you respond?



Photo Copyright TrioLET

AIRLINERS.NET



Photo Copyright Josef P. Willems

AIRLINERS.NET



818m

**818m,
WHY?**





**Magnificent
engineering
structure?**

OR



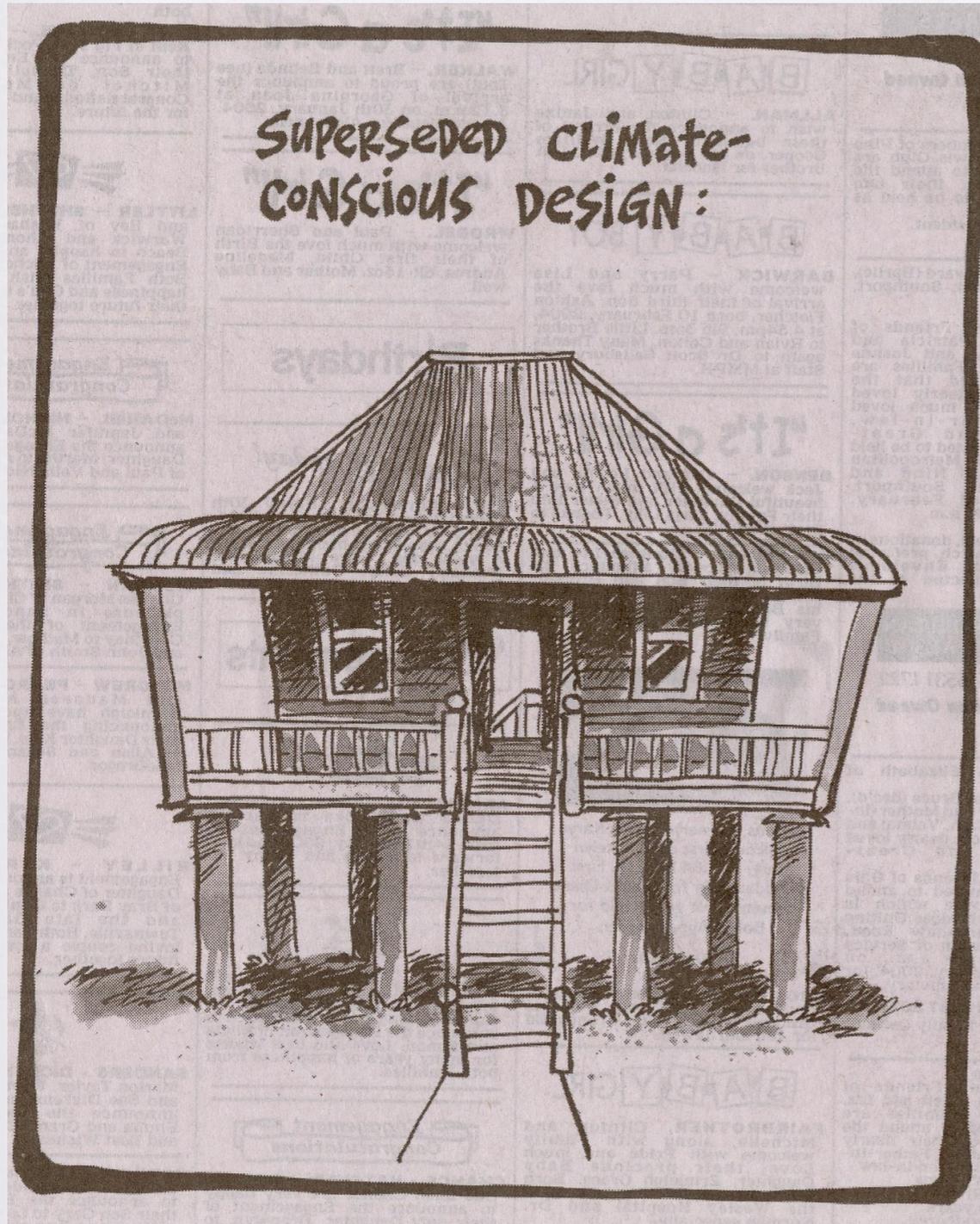
Visual amenity degraded in the name of economic efficiency & progress....

“Any intelligent fool can make things bigger, more complex, and more violent.

It takes a touch of genius -- and a lot of courage -- to move in the opposite direction.”

Albert Einstein

Our Residential Environment



1800 to early 1900s



Today

Impact Disclosure?

Observatory Hill Rotunda Photographed by Ken Middleton

Pack a picnic and head to The Observatory in Fort Street, The Rocks to enjoy great views of Sydney Harbour from Observatory Hill Park – the highest point in the city.

Tomato Kasundi

INGREDIENTS

Tomato (66%), sugar, vinegar, ginger, herbs and spices, canola oil, salt, modified starch (1422), garlic, curry leaves.

Made in a factory that also processes peanuts and tree nuts.

NUTRITION INFORMATION

SERVES PER PACK 1 SERVING SIZE 15g

Average Per Serve	Per 100g
Energy (kJ)	75.3 502
Protein (g)	0.3 2.0
Total Fat (g)	0.72 4.8
- saturated (g)	.006 0.4
Carbohydrate (g)	2.6 17.1
- sugars (g)	2.1 14.0
Sodium (mg)	146.7 978

Breadsticks

INGREDIENTS

Wheat flour, olive oil, liquid malt extract, salt, yeast, pepper.

Made in a factory that also processes peanuts and tree nuts.

NUTRITION INFORMATION

SERVES PER PACK 1 SERVING SIZE 20g

Average Per Serve	Per 100g
Energy (kJ)	391 1860
Protein (g)	2.4 11.4
Total Fat (g)	3.0 14.1
- saturated (g)	0.4 2.0
Carbohydrate (g)	13.8 65.8
- sugars (g)	0.7 3.2
Sodium (mg)	170 812

Spicy Carrot & Lentil Dip

INGREDIENTS

Carrot (30%), water, vegetables, canola oil, lentils (7%), lemon juice, vinegar, salt, coriander, ginger, milk solids, herbs and spices, sugar, garlic, thickener (415).

Made in a factory that also processes peanuts and tree nuts.

NUTRITION INFORMATION

SERVES PER PACK 1 SERVING SIZE 15g

Average Per Serve	Per 100g
Energy (kJ)	100 666
Protein (g)	0.42 2.8
Total Fat (g)	1.9 12.6
- saturated (g)	0.14 0.9
Carbohydrate (g)	1.05 7.0
- sugars (g)	0.5 3.2
Sodium (mg)	77.1 514

THE SYDNEY BISCUIT COMPANY

69 Marrickville Road Marrickville NSW Australia Tel 61 2 9516 5226

Fax 61 2 9516 0966 www.thesydneybiscuitcompany.com.au

Packaging designed by EGG Design Tel 61 2 9438 5988



Nutrition Information		
Servings per package: 4 Serving size: 250mL		
	Average quantity per serving	Average quantity per 100mL
Energy	530 kJ 128 Cal	212 kJ 51 Cal
Protein	9.8 g	3.9 g
Fat - Total	3.5 g	1.4 g
- Saturated	2.3 g	0.9 g
Carbohydrate		
- Total	13.8 g	5.5 g
- Sugars (lactose)	13.8 g	5.5 g
Sodium	143 mg	57 mg
Calcium	(42% RDI*) 335 mg	134 mg
Riboflavin	(28% RDI*) 480 µg	192 µg

RDI* Recommended Dietary Intake

TOTAL FAT 1.4%

INGREDIENTS: SKIM MILK, MILK, CONCENTRATED SKIM MILK OR SKIM MILK POWDER.

NOT SUITABLE AS A COMPLETE MILK FOOD FOR CHILDREN UNDER THE AGE OF TWO YEARS

ULTRA HEAT TREATED HOMOGENISED LOW FAT MILK

Made in Australia™ Registered Trade Mark

In flight biscuit pack - \$2.50

UHT Milk - \$2.00

Impact Disclosure?

**Low GI
Apple & Blueberry
MUFFINS**

NUTRITION INFORMATION

When LOW GI Apple & Blueberry Muffins are prepared according to standard pack directions using polyunsaturated oil.

SERVINGS PER PACKAGE: 12 MUFFINS
SERVING SIZE: 65g PER MUFFIN

	AVERAGE QUANTITY PER 65g SERVING	AVERAGE QUANTITY PER 100g
ENERGY	741kJ (177 Cal)	1140kJ (273 Cal)
PROTEIN	6.8g	10.4g
FAT - TOTAL	7.3g	11.3g
- SATURATED	1.3g	2.0g
CARBOHYDRATES	20.9g	32.1g
- SUGARS	13.0g	20.0g
SODIUM	365mg	562mg

INGREDIENTS

FRUCTOSE, MAIZE STARCH, WHEAT FLOUR, WHEAT GLUTEN, BUTTERMILK POWDER, DRIED APPLE PIECES (6.5%), DRIED [CONTAINS PRESERVATIVE (220)], DRIED BLUEBERRIES (3%) [BLUEBERRIES, SUGAR, VEGETABLE OIL] VEGETABLE FATS & OILS [EMULSIFIERS (471, 477), ANTIOXIDANT (320)], RAISING AGENTS (450), SODIUM BICARBONATE, NATURAL FLAVOURS, SALT, VEGETABLE

Muffin mix - \$3.50

FARFALLE n°65
COTTURA 10 MINUTI

Quantità per porzione	Quantità per porzione	Quantità per 100g
ENERGIA	kJ 1284	kJ 1284
PROTEINE	g 10,2	g 10,2
GRASSI TOTALI	g 7,8	g 7,8
SATURATI	g 0,9	g 0,9
CARBOIDRATI TOTALI	g 21,4	g 21,4
ZUCCHERI	g 0,0	g 0,0
SODIO	mg 2	mg 2

DURUM WHEAT SEMOLINA PASTA - Ingredients: durum wheat semolina - 100g PASTA + 1 LITRE WATER + 10g SALT. - Bring water to a fast boil and add salt. Add pasta and cook for 10 minutes, stirring occasionally. Drain and serve. - For Australia imported by Barilla Australia, Pty Ltd, 9 Deane Street, Burwood, 2134 NSW - For Singapore imported by Dawood Exports Pte Ltd - 8, Pandan Crescent, #02-03, UE Tech Park, Singapore 128464 - Tel.0065-62716500. For UK & Ireland: to contact Barilla: www.barilla.com. Produced in the factory marked with the letter within brackets close to the date. (A) Parma (I) - Via Mantova, 166; (F) Foggia (I) - Via S.S. 126 km 684+300; (E) Marcellise (Caserta - I) - Via S.S. 87 km 20+500; (GG) Tebe (GR) - S.R. Atene - Lania km 75.

PASTA ALIMENTICIA DE SÉMOLA DE TRIGO DURO DE CALIDAD SUPERIOR - Ingredientes: sémola de trigo duro - PESO NETO: 500g PRODUCTO DE ITALIA - 100g PASTA + 1 LITRO de AGUA + 10g de SAL. Echar la sal en el agua hirviendo. Añadir la pasta. Revolver durante el primer minuto de cocción. Dejarla cocinar durante el tiempo recomendado. Escurrirla sin eliminar toda el agua. Importado y distribuido en: Venezuela por: ALFONZO RIVAS & CIA Chuao, Av. La Estancia, EDIF. GRAL. PISO 8, Caracas, Venezuela. Tel.: 800 - 2534696. - Registrado en el M.S.A.S. bajo el No. A-24.253.

PASTA AV DURUMVETE - Ingredienser: durumvete - 100g PASTA - 1L VATTEN - 10g SALT: Tillsätt saltet i det kokande vattnet. Lägg i pastan och rör om. Låt koka i 10 minuter. Häll bort vattnet och servera. - TILLVERKAD I ITALIEN, ADRESS NEDAN. Konsumentkontakt: 020 - 75 80 81.

PASTA AF DURUMHVEDE - Ingredienser: durumhvede - 100gr. pasta - 1L vand - 10gr. salt. Kom salt i det kogende vand. Tilsæt pasta, rør, af og til. Skal koge i 10 min. Si pastaen, men behold lidt af vandet. FREMSTILLET I ITALIEN.

DURUMHVEDEPASTA: Ingredienser: durumhvete - 100 g pasta - 1 liter vann - 10 g salt. Kok opp vann og tilsett salt. Legg i pasta og kok anbefalt tid, rør om av og til. Sil av vannet og server. Opprinnelsesland: Italia.

TESTENINE - Neto težina: 500g. Sestavine: zdrob pšenice durum. Hraniti v hladnem in suhem prostoru. Uporabno najmanj do datuma označenega na embalaži. Čas kuhanja označen na embalaži. Proizvajalec: Barilla G. e R. Fratelli - Società per Azioni - Via Mantova 166, Parma - Italija.

TJESTENINA. Neto težina: 500g. Sastav: krupica durum pšenice. Čuvati na hladnom i suhom mjestu. Upotrebljivo najmanje do datuma otisnutog na pakiranju. Vrijeme kuhanja otisnuto na pakiranju. Proizvođač/Zemlja porijekla: Barilla G. e R. Fratelli - Società per Azioni - Via Mantova 166, Parma - Italija. Uvoznik za HR: AIWT International doo, Slavenska avenija bb, Zagreb. Za BiH: Violeta d.o.o., Tomislavgrad. Za SR: Tradeky, Novi Beograd. Za CG: Expo Commerce, Kotor.

PASTE ALIMENTARE - Ingrediente: grâu din grâu dur - Mod de preparare (pentru 100 gr. de paste): se pune la fier 1 litru de apa cu 10 gr. de sare. Când apa fierbe, se pun pastele și se amestecă de câteva ori. Se strecoară și se servește cu diverse sosuri și Parmigiano Reggiano. Timp de fierbere: 10 minute. - Importat din Italia de ROMCO s.r.l. - telefon: 02102101455 - Calea Mășilor 235 - Bloc 43 Apt.23 - București.

DURUMVEHNÄSTÄ VALMISTETTU PASTA - Ainekset: durumvehnä jauho - VALMISTETTU ITALIASSA, OSOITE ALAREUNASSA 100G pastaa, 1L vettä, 10G suolaa. Lisää suola ja pastaa kiehuvaan veteen, sekoita. Keitä pastaa 10 minuuttia. Kaada vesi pois. Valmis tarjottavaksi.

ΖΥΜΑΡΙΚΑ ΑΠΟ ΣΙΜΙΓΔΑΛΙ ΙΚΑΝΗΡΟΥ ΣΙΤΑΡΙΟΥ. Ύψιστος: σιμιγδάλι σιτηρού σιταριού. Παρασκευάζεται με Ε.Ε. από την Barilla G. e R. Fratelli - Società per Azioni, Via Mantova 166, Parma - Italy. Για αναμειγμένα ή ψημένα προϊόντα τηλεφωνώστε στο 2105197800.

סוגים פירולה. אסורות מכלים מומלצים דורים. זמן בישול: 10 דקות. למוצר במקום קריר והבט
אין יוצר אסולה וכיבוד מכלים מומלצים דורים. זמן בישול: 10 דקות. למוצר במקום קריר והבט
סוגים פירולה. אסורות מכלים מומלצים דורים. זמן בישול: 10 דקות. למוצר במקום קריר והבט
אין יוצר אסולה וכיבוד מכלים מומלצים דורים. זמן בישול: 10 דקות. למוצר במקום קריר והבט

MASSA DE SÉMOLA DE TRIGO DURO - Ingredientes: sémola de trigo durum. CONTEM GLUTEN - Produto fabricado na Itália por: Barilla G. e R. Fratelli - Società per Azioni - Via Mantova 166, Parma - Itália. Peso líquido: 500g.

www.barilla.com

Barilla G. e R. Fratelli - Società per Azioni - Via Mantova 166, Parma - Italy.

Even in 12 languages.....

Impact Disclosure?



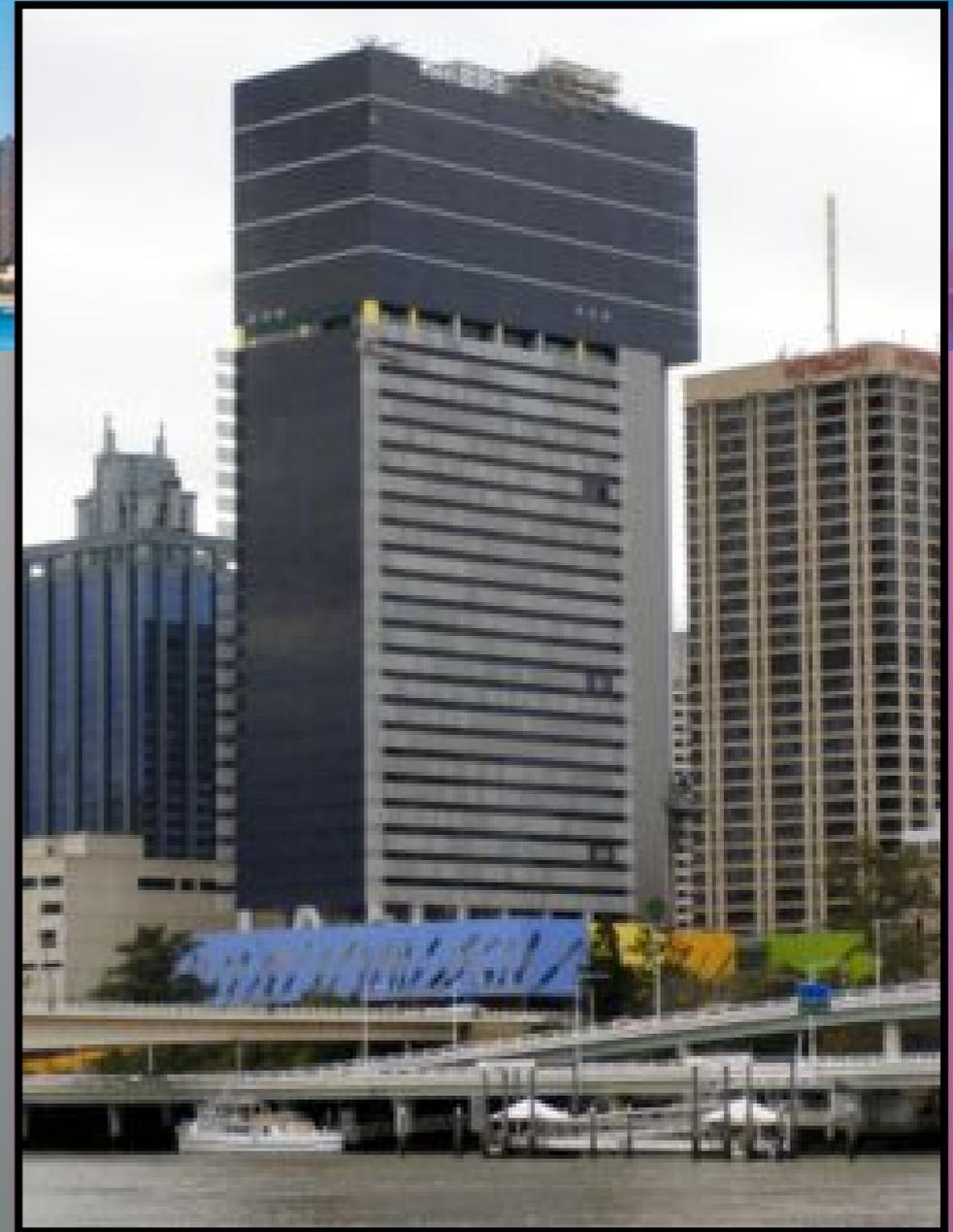
Buildings for 1000s of people - cost: \$1,000m +

Disclosure: Nothing!

Impact Disclosure?



Some
change.



Rating tools are assisting

Green Star, NABERS

“Green Star” Rating

Green Star - Office Design evaluates the environmental **potential** of the design of commercial office buildings (base building construction or refurbishment).

Green Star - Office as Built

assesses the same design initiatives as Green Star - Office Design but the validation documentation differs in that it is retrospective and therefore evaluates those initiatives that are relevant to the construction of the building and are the responsibility of the contractor.



Green Buildings Council of Australia



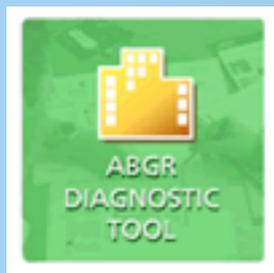
Australian Building Greenhouse Rating

- **Provided market recognition and a competitive advantage for low greenhouse emitters and energy efficient buildings;**
- **Encouraged best practice in the design, operation and maintenance of commercial buildings to minimise greenhouse emissions**

NOW NABERS Energy



Administered nationally by NSW and locally by state greenhouse agencies, the ABGR scheme rates buildings from one to five stars with five stars representing exceptional greenhouse performance.



Key features of ABGR:

- It's voluntary – a rating can be initiated by a building owner, manager or tenant;
- It rates a building according to its actual performance, using 12 months' energy data;
- It can be used for the base building (central services), whole building or individual tenancies;
- It allows developers to "badge" the greenhouse performance of their new office development from the outset on the proviso that DEUS will rate its actual operational performance and advise the tenants;
- It's available now for all Australian office buildings.

National Australian Built Environment Rating System



NABERS is a performance-based rating system that measures an existing building's overall environmental performance during operation.



NABERS rates a building on the basis of its measured operational impacts

(energy, refrigerants (greenhouse and ozone depletion potential), water, storm-water runoff and pollution, sewage, landscape diversity, transport, indoor air quality, occupant satisfaction, waste and toxic materials, etc).

NABERS - developed by Commonwealth, commercialised by NSW DECCW



UDIA

Enviro-development

- Enviro-development is a market-driven incentive-based framework to encourage more sustainable developments.
- It is designed as a partnership between local government, state government, developers (through UDIA) and other stakeholders.
- Enviro-development is designed to be applicable to a range of situations including greenfield and infill sites, detached housing, high-rises and industrial developments.

Other tools:

Whole developments or projects:

- SA;
- BASIX;
- Matrix;
- PSM;
- M4i;
- CEEQUAL

Individual buildings:

- LEED;
- BREEAM;
- GB Tool;
- NATHERS;
- WERS;
- BERS;
- AccuRate;
- FirstRate....

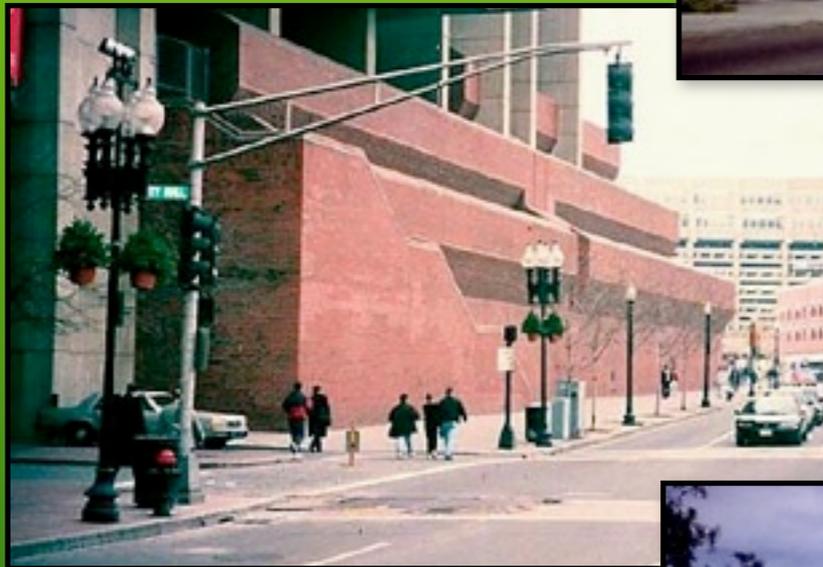
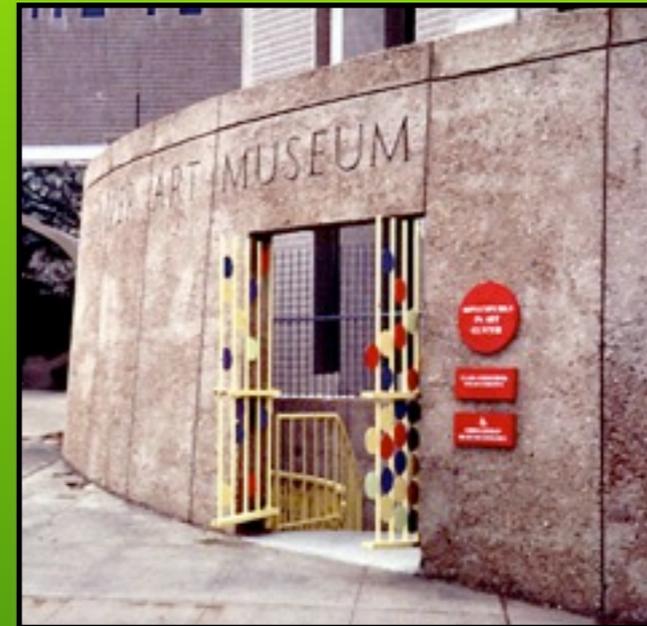
Are these “rating tools” enough?

It's pretty simple arithmetic: We cannot ever achieve sustainability without a dramatic change in built environment design, delivery and operation.



WE NEED Net Positive Development

(Development that reverses environmental impacts, and increases natural, social and economic capital)



*Find the
life form..*



at a net return on investment.

Business can save the planet at a profit... but not the way we currently design development.

Why aren't sustainable living options even on the market?

- **Despite greater efficiency, the scale of degradation and depletion is growing and total resource flows are increasing.**
 - **The built environment is half our problem (energy and material consumption, greenhouse gas and toxins);**
 - **Time is running out.....**

Are current "green" buildings enough?

At present, there are no examples of net positive development.

ESD only tries to mitigate impacts relative to conventional (unhealthy, resource-guzzling) buildings..... yet

Buildings that restore environmental and human health are feasible now with simple eco-technologies.....



How can buildings restore the living environment?

Low-cost natural systems can fix problems created by dumb design in cities and buildings!

'Living Machines': tanks full of ecosystems that learn to eat specific wastes and toxins, are converting sewage into healthy fish, plants and other products.



There are magic mushrooms can erase toxins and still be safe to eat.

How will this happen?

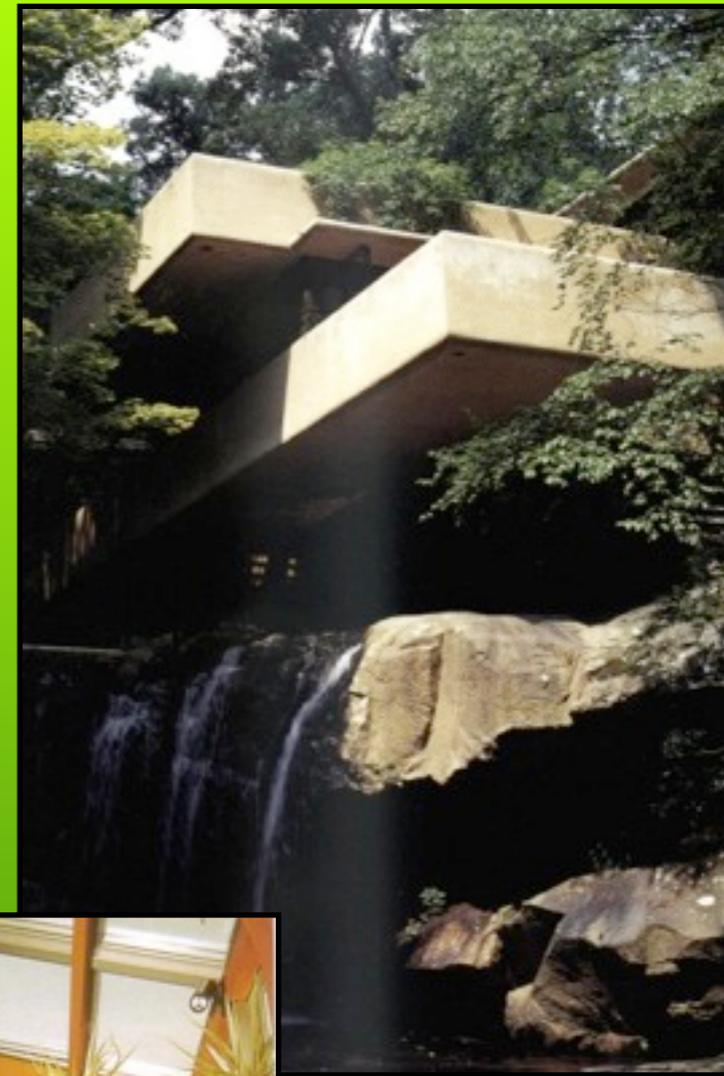
**We need to demonstrate a new paradigm:
'Design for Ecosystem Services'**

'Ecosystem services' generate energy, treat sewage, provide healthy air, water, soil and many other essential functions for free.



Buildings can become 'living machines' or bioconversion facilities.

'Vertical wetlands', roof gardens and planting walls can cleanse water and air and create exciting spaces and sculptural forms for living, working and learning.



'Multi-functional'
use of space



Eco-development 'decouples' economic growth from environmental impacts: we can make money while cleaning up the problems caused by dumb design.

Eco-design technologies for new and existing buildings can pay for themselves in energy savings.

Investments in energy efficiency, increased day-lighting and natural ventilation bring a better financial return than most stocks and bonds.

Eco-design pays financial dividends through increased worker productivity and morale, lower absenteeism and compensation claims.

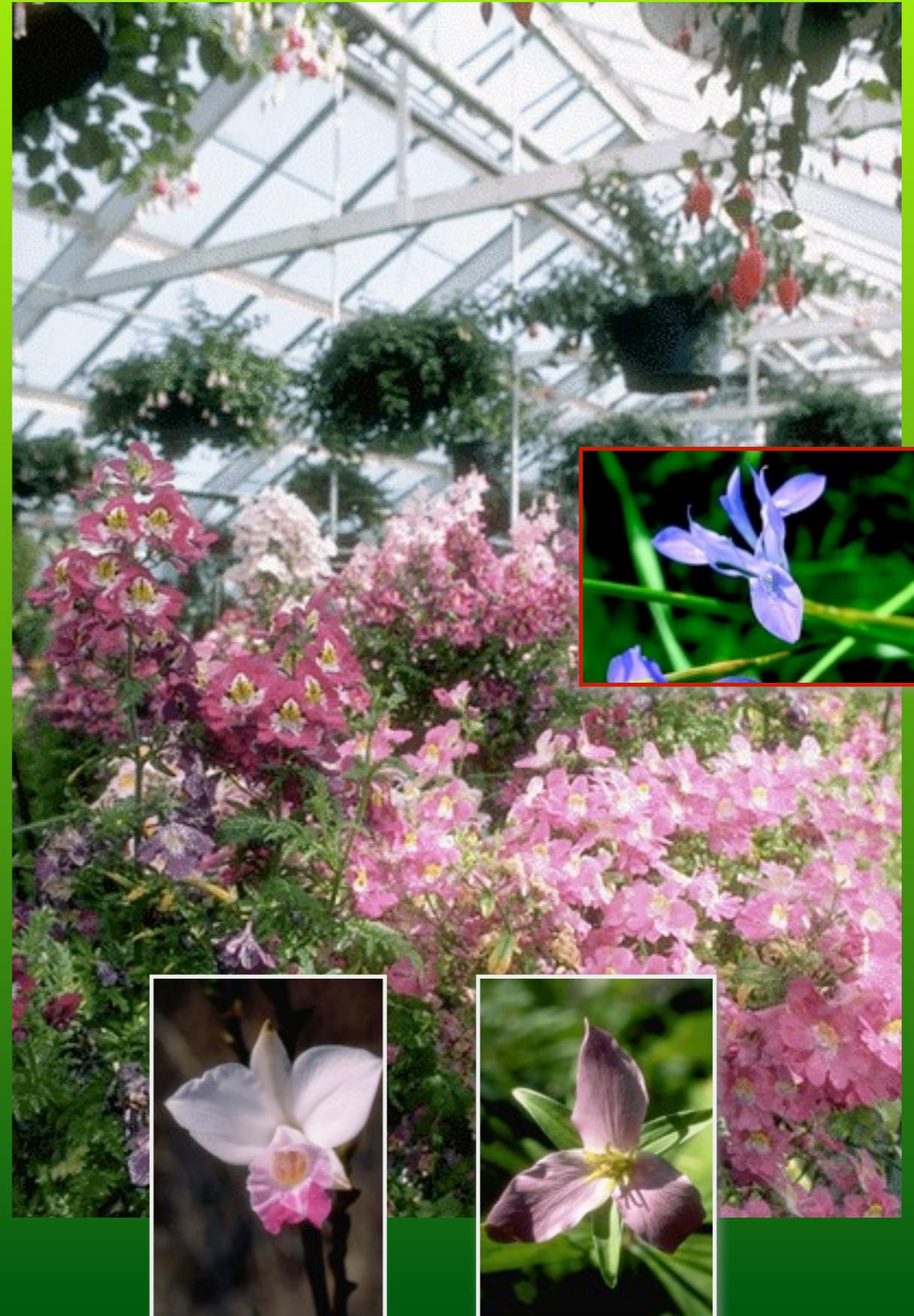


Can we afford not to redesign the built environment?

The costs of business as usual buildings are staggering (sick buildings cost Australia \$12 billion per year).

1/3rd of new buildings cause Sick Building Syndrome, yet there is no health warnings on buildings.

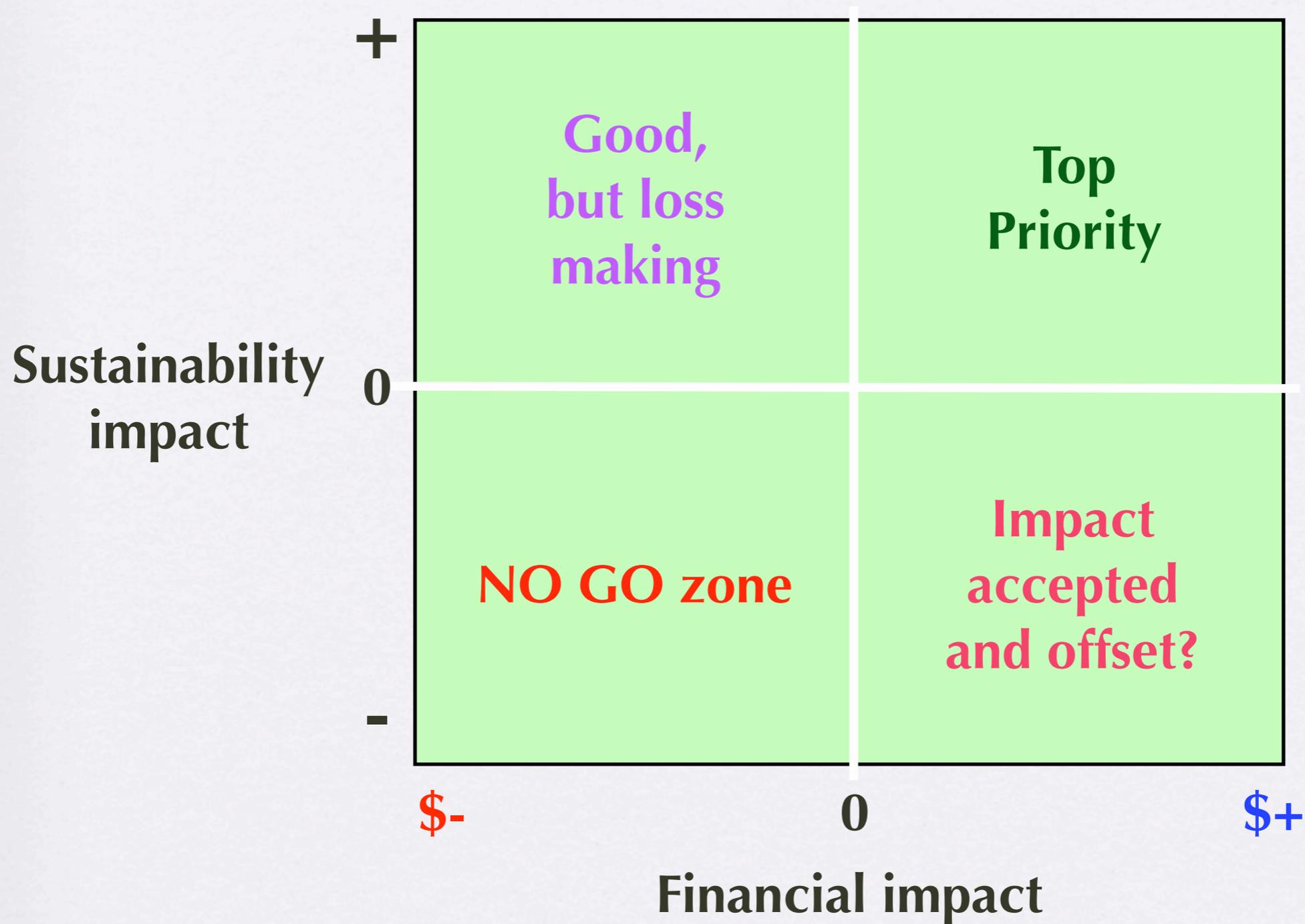
Hospital patients recover more quickly when they have views of nature or can spend time in gardens.



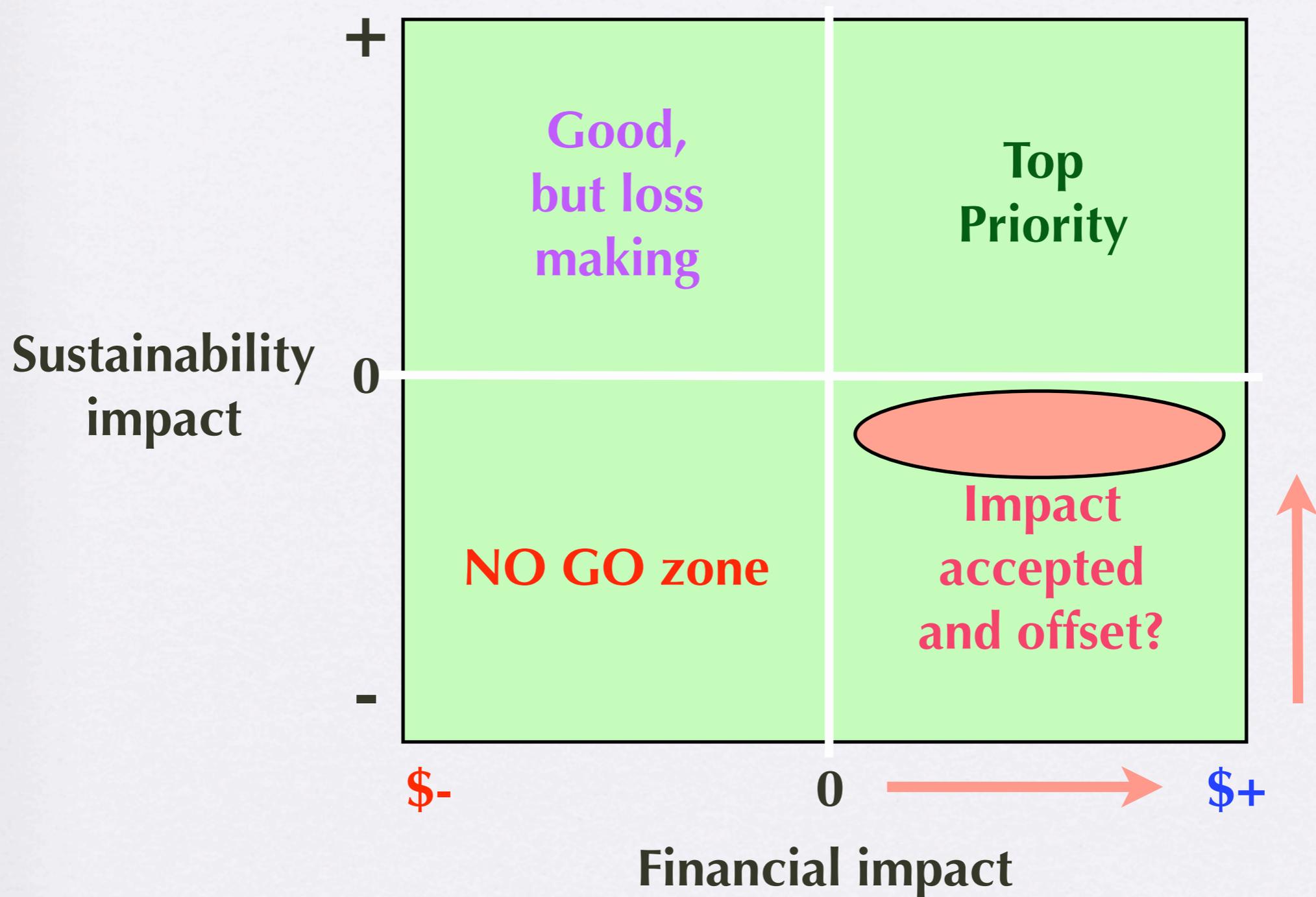
**“The definition of madness
is doing the same thing
over and over again, and
expecting to achieve
different results.”**

Albert Einstein

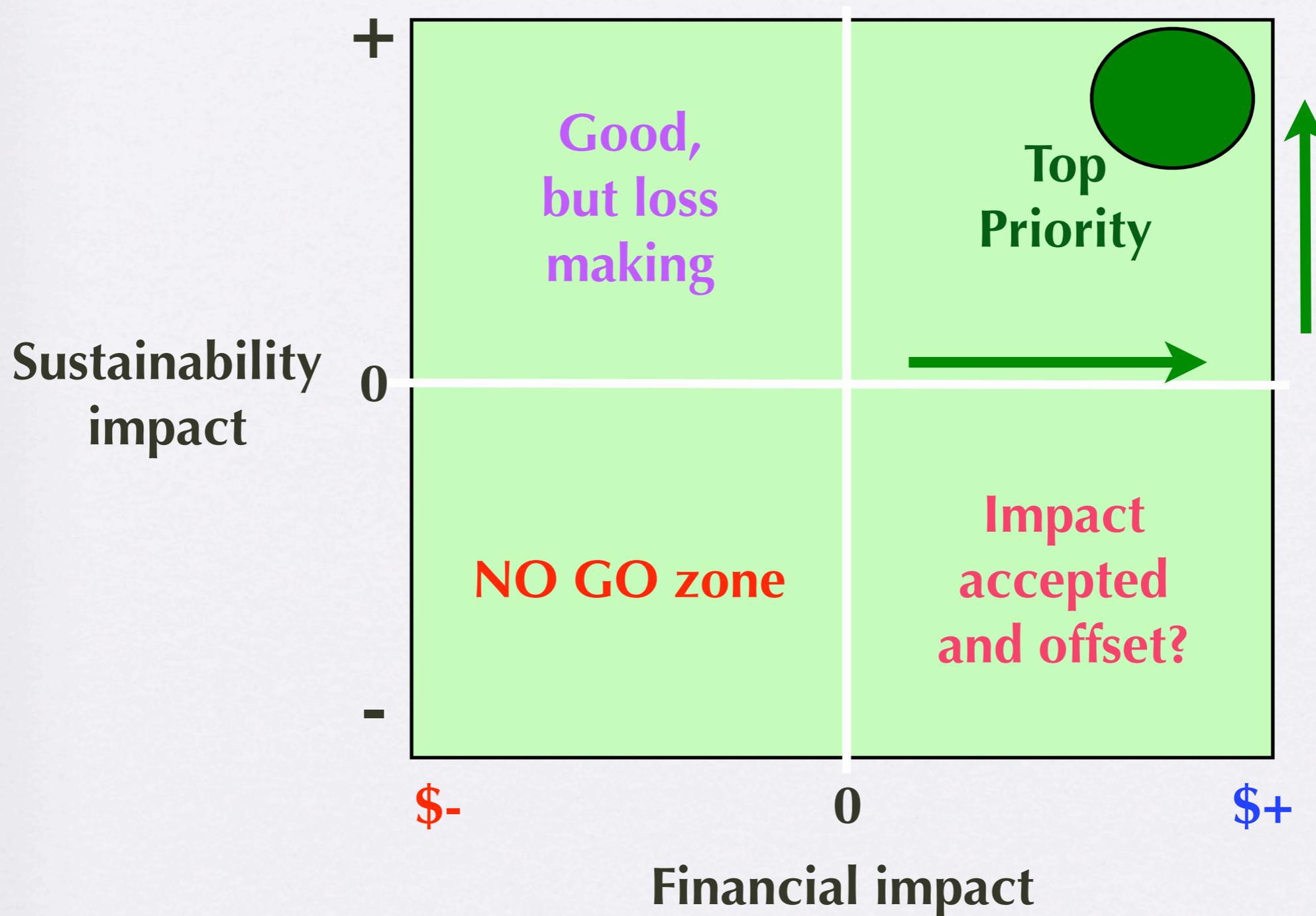
What should our engineering education be aiming for?



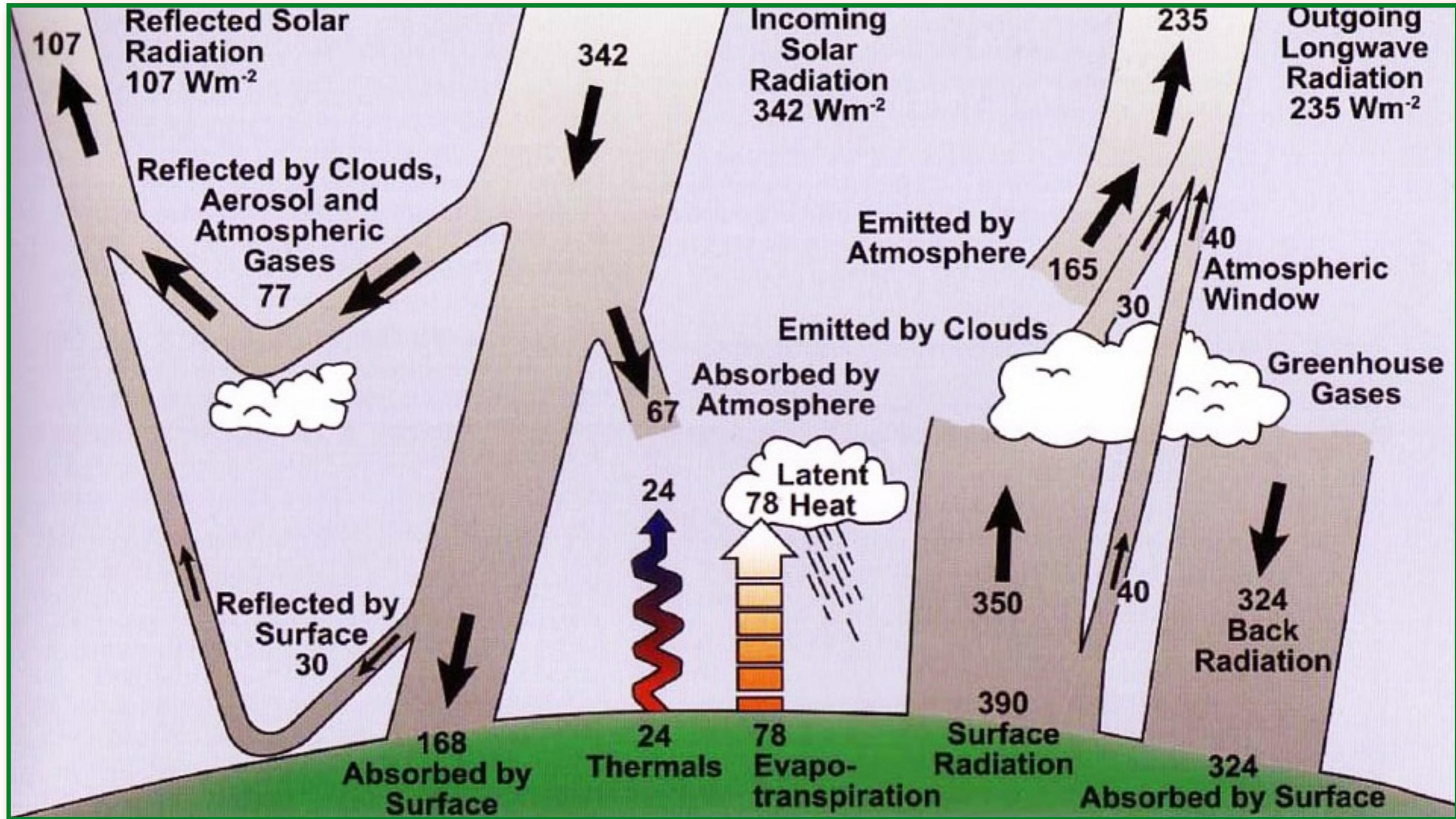
What should our engineering education be aiming for?



What should our engineering education be aiming for?



Solar/earth radiation energy balance

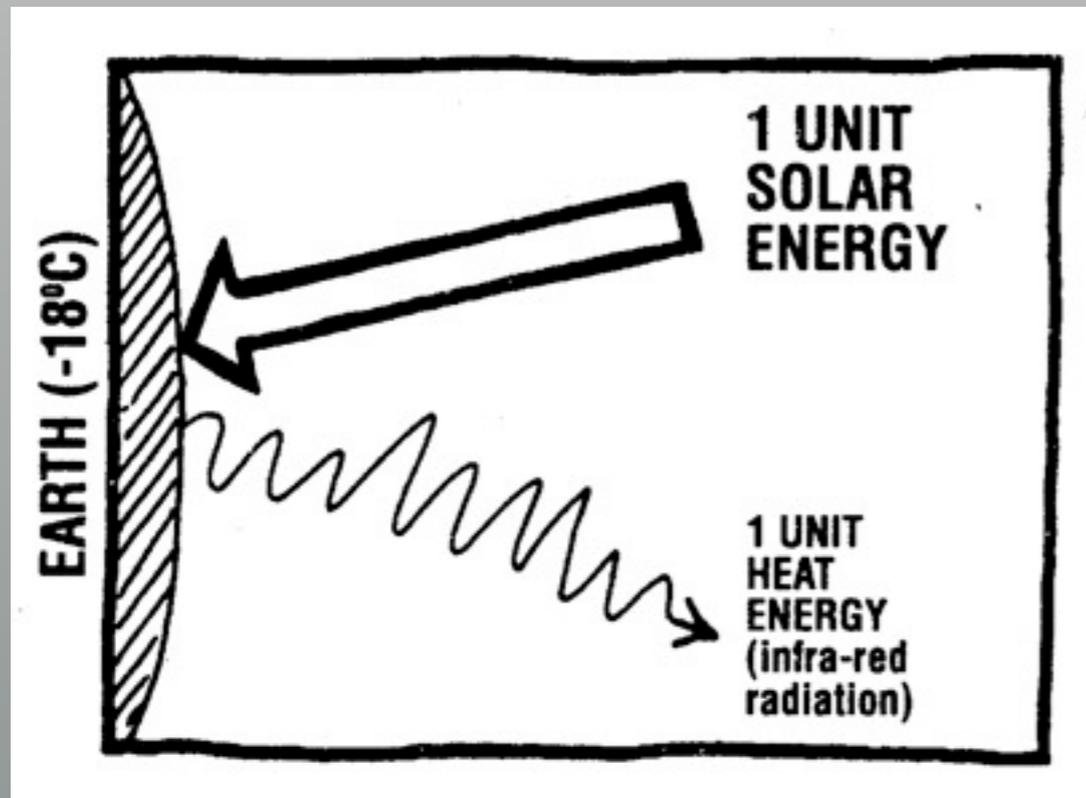


Source: Keith & Trenberth 1997

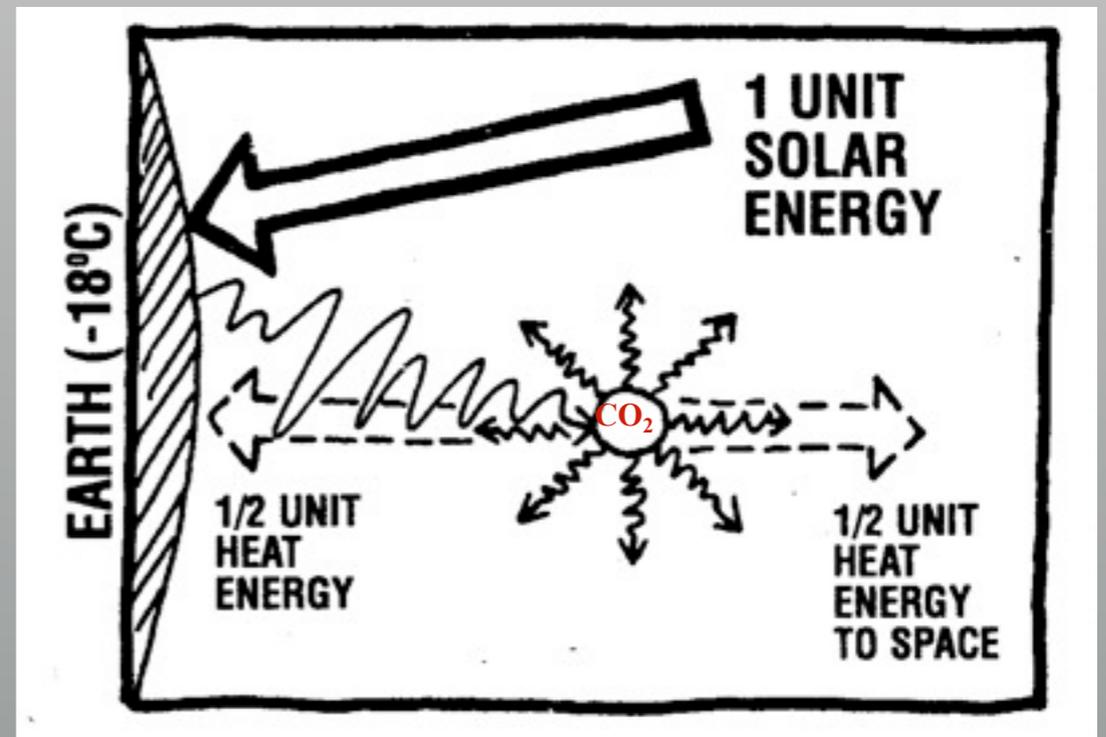
Radiation balance of earth/ocean/atmosphere system

A little easy science:

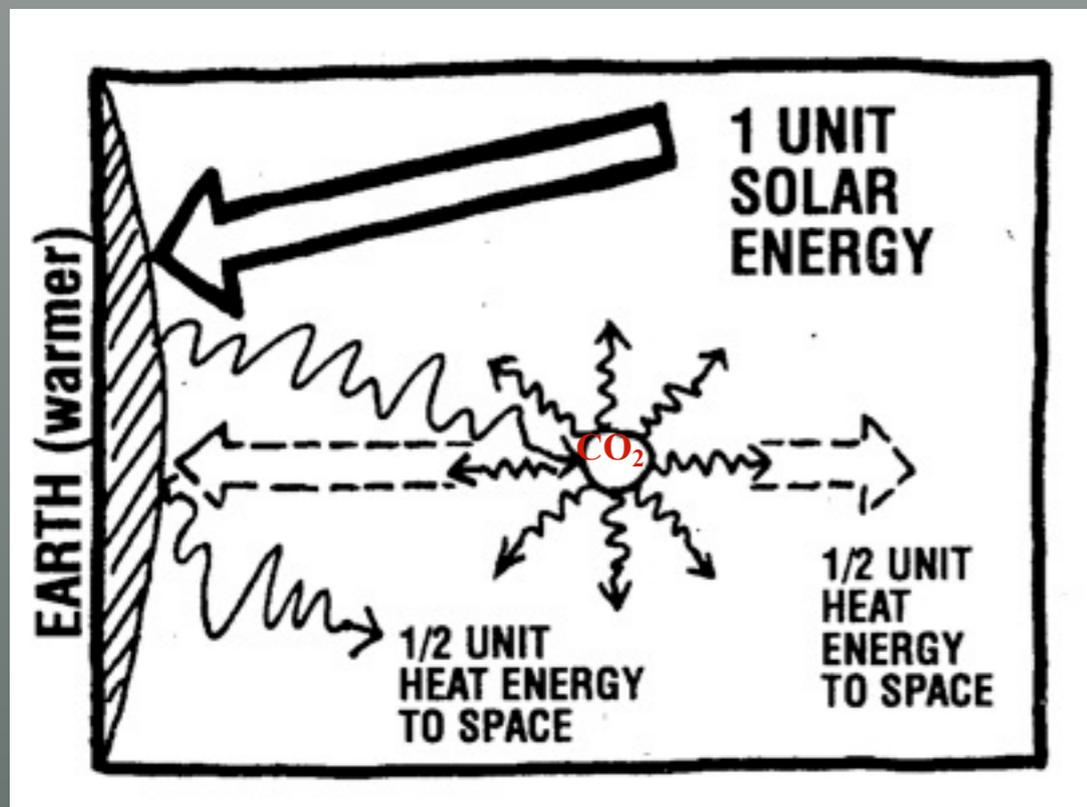
1.



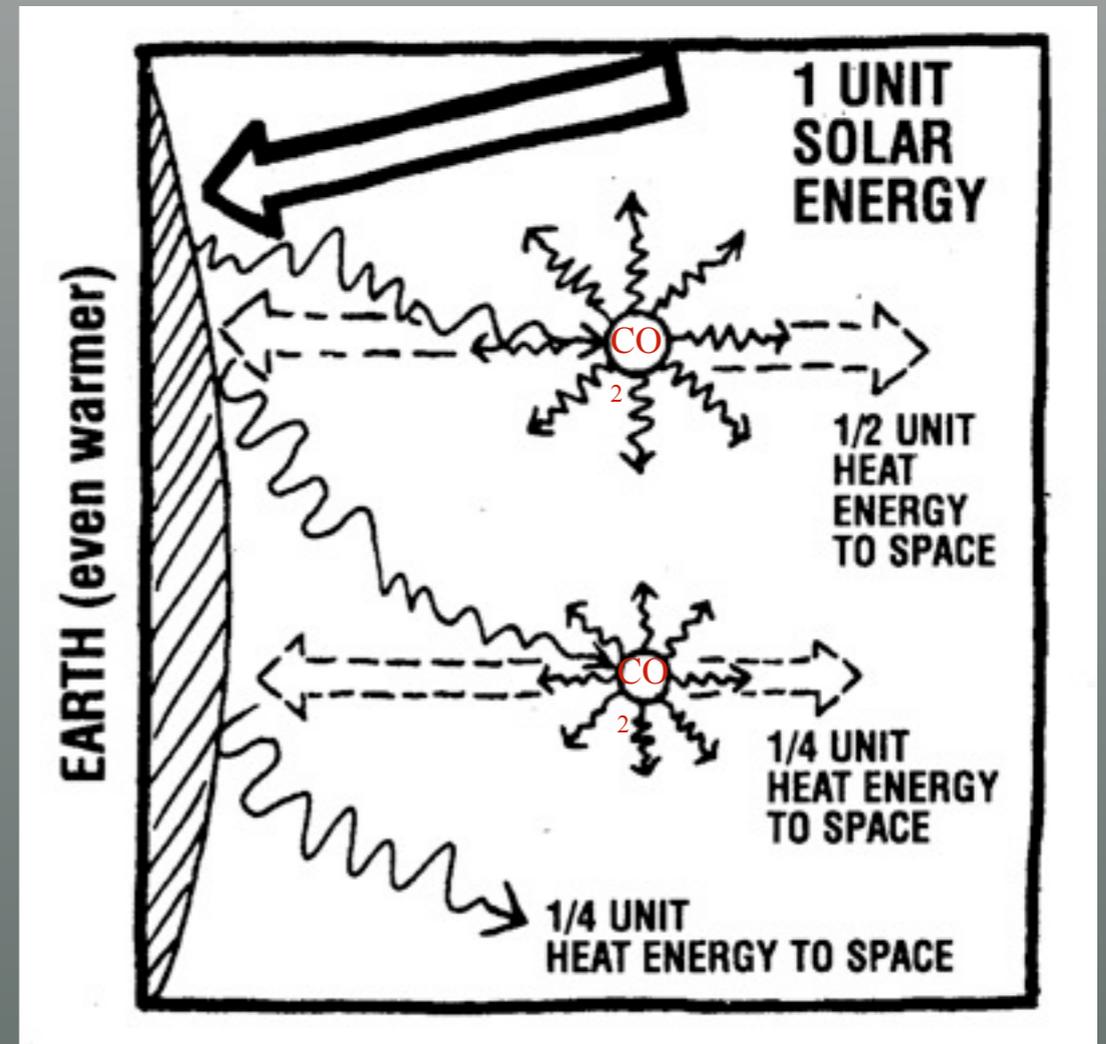
2.



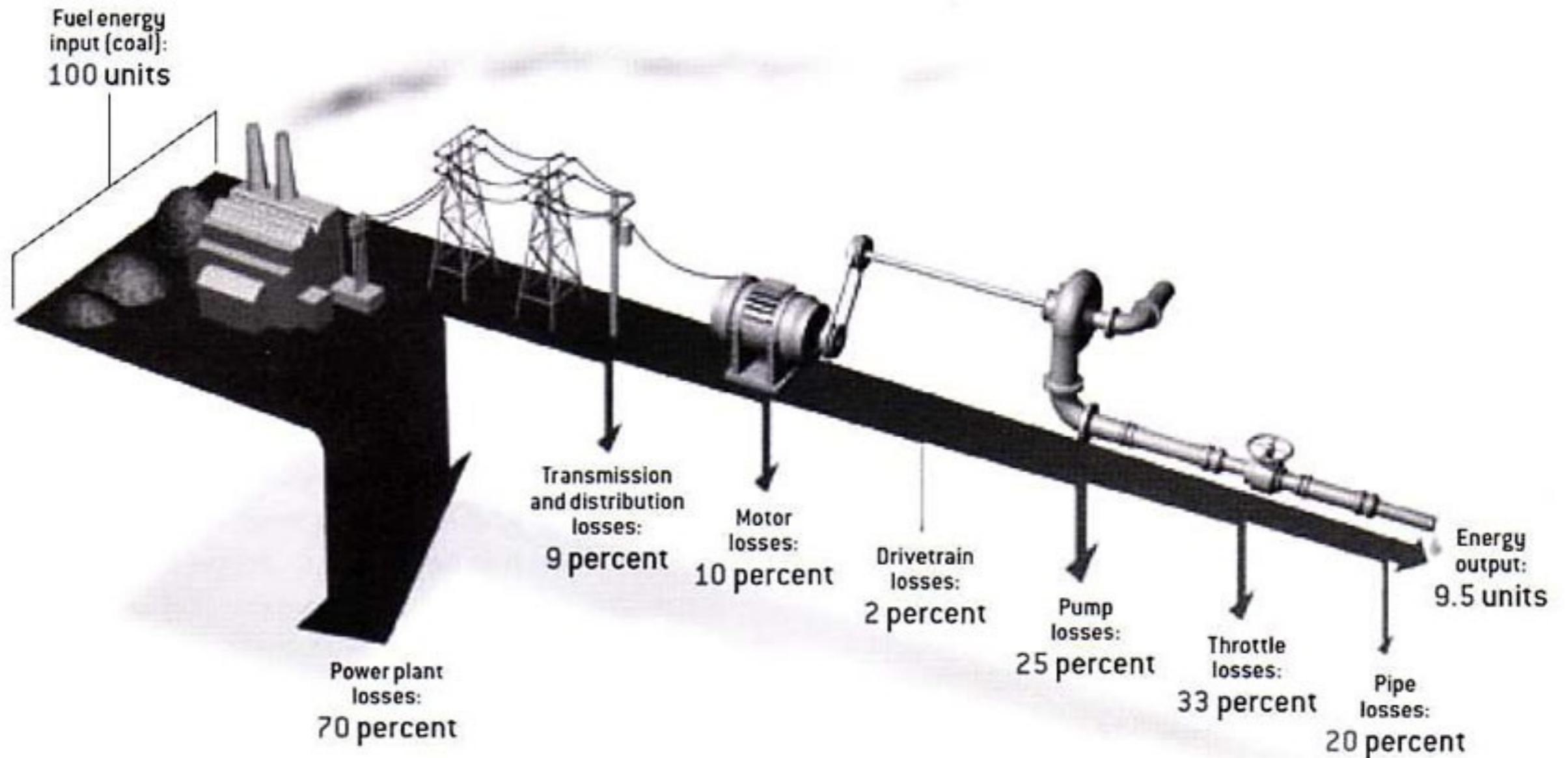
3.



4.



Efficient Use of Nat Capital?



Source: Lovins (2005)³

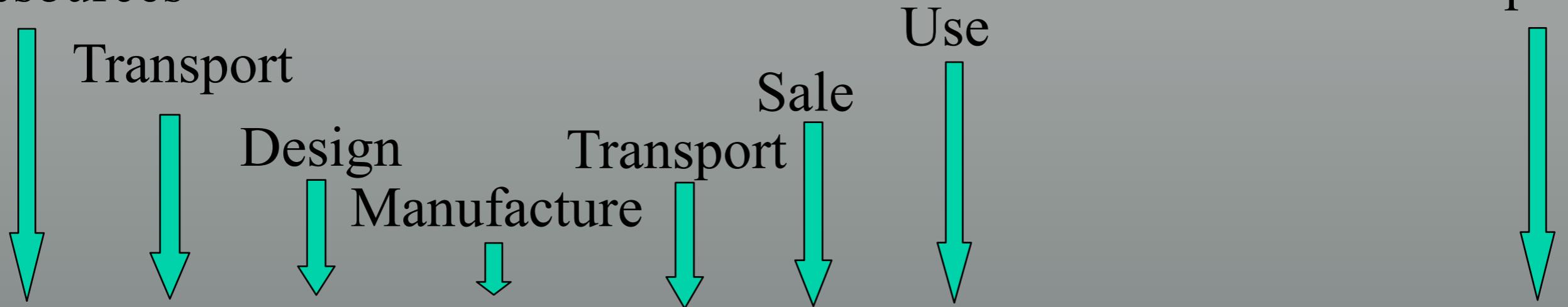
More than 90% of the energy is lost -
warming the planet for no purpose to us.

Linear Thinking

PRODUCT

Resources

Disposal



Engineering input



Start

Stop



Systems Thinking

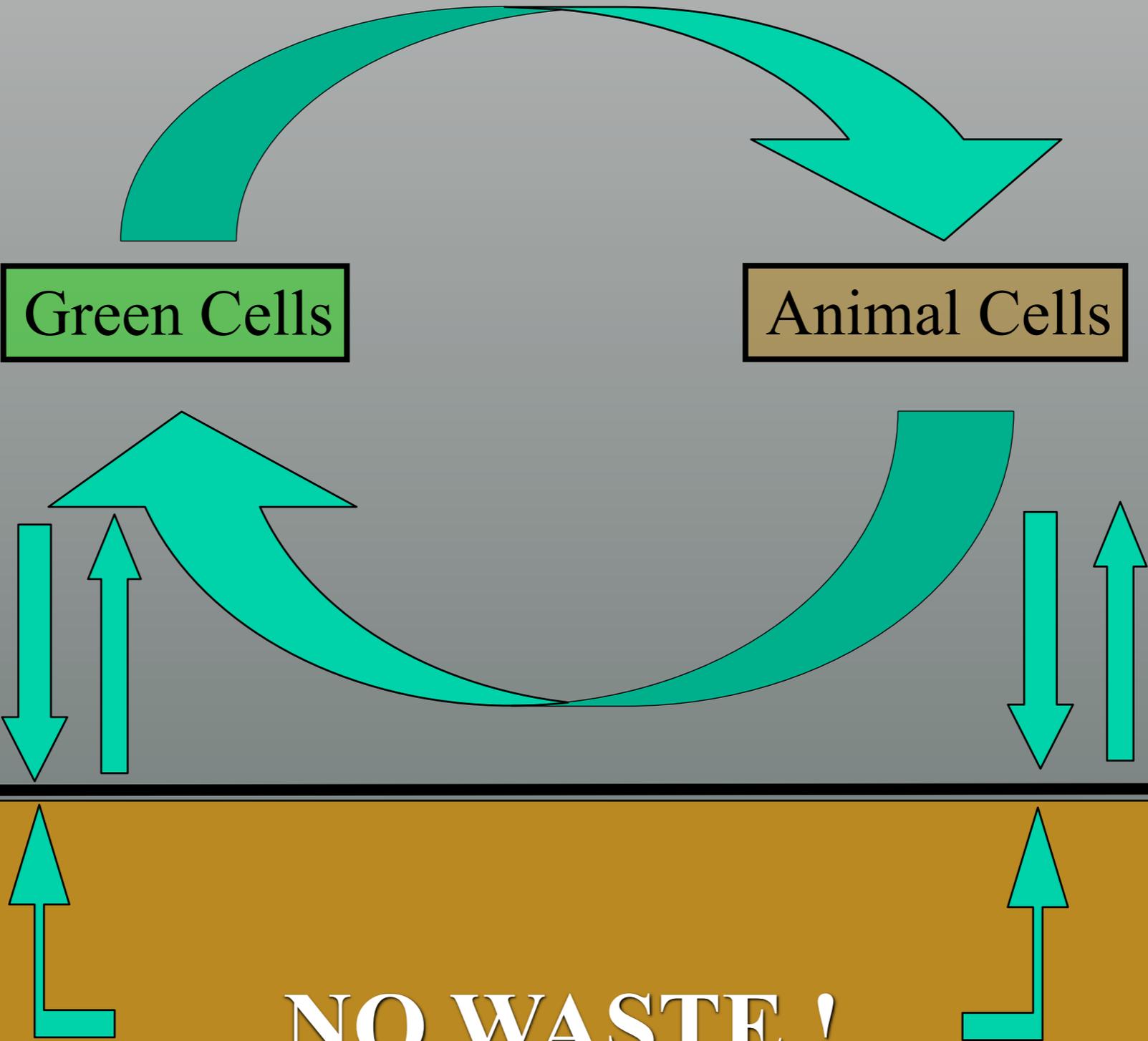
Nature does not show us a series of isolated building blocks, but rather a complex web of relationships all working together as a unified whole.

Every part depends upon, and supports every other part of the system....

Capra



Nature



PRODUCT

The PARADIGM Change

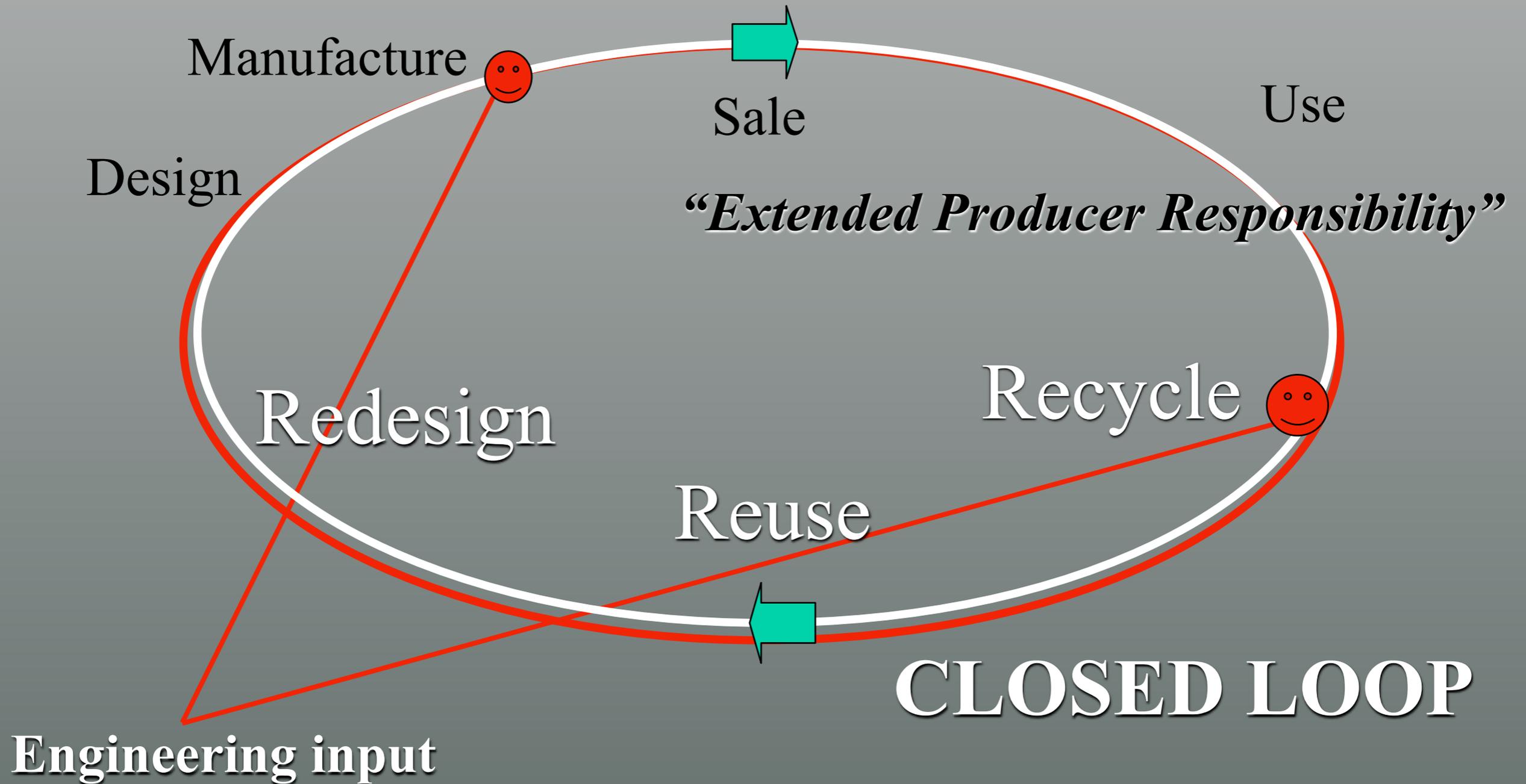
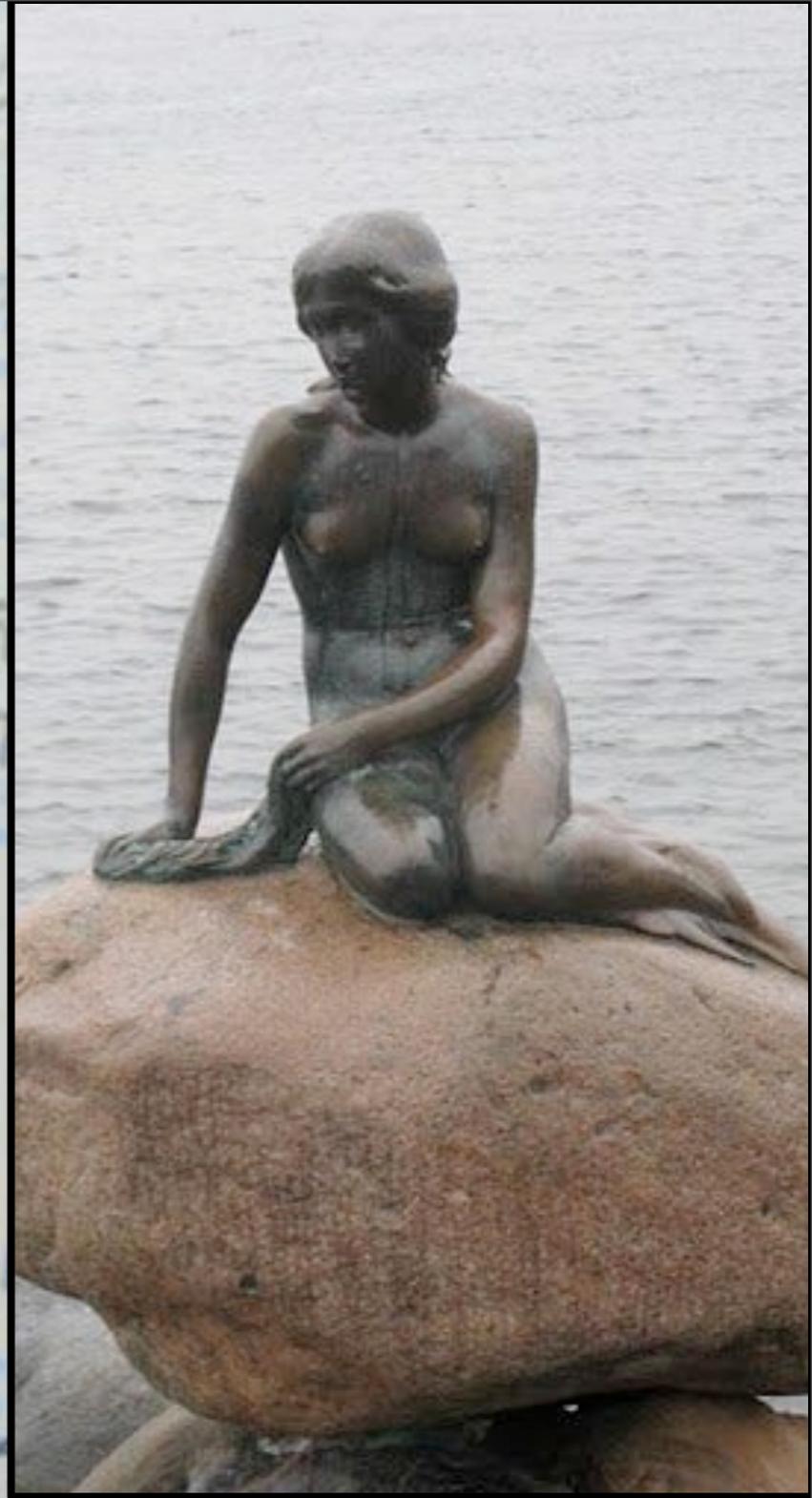
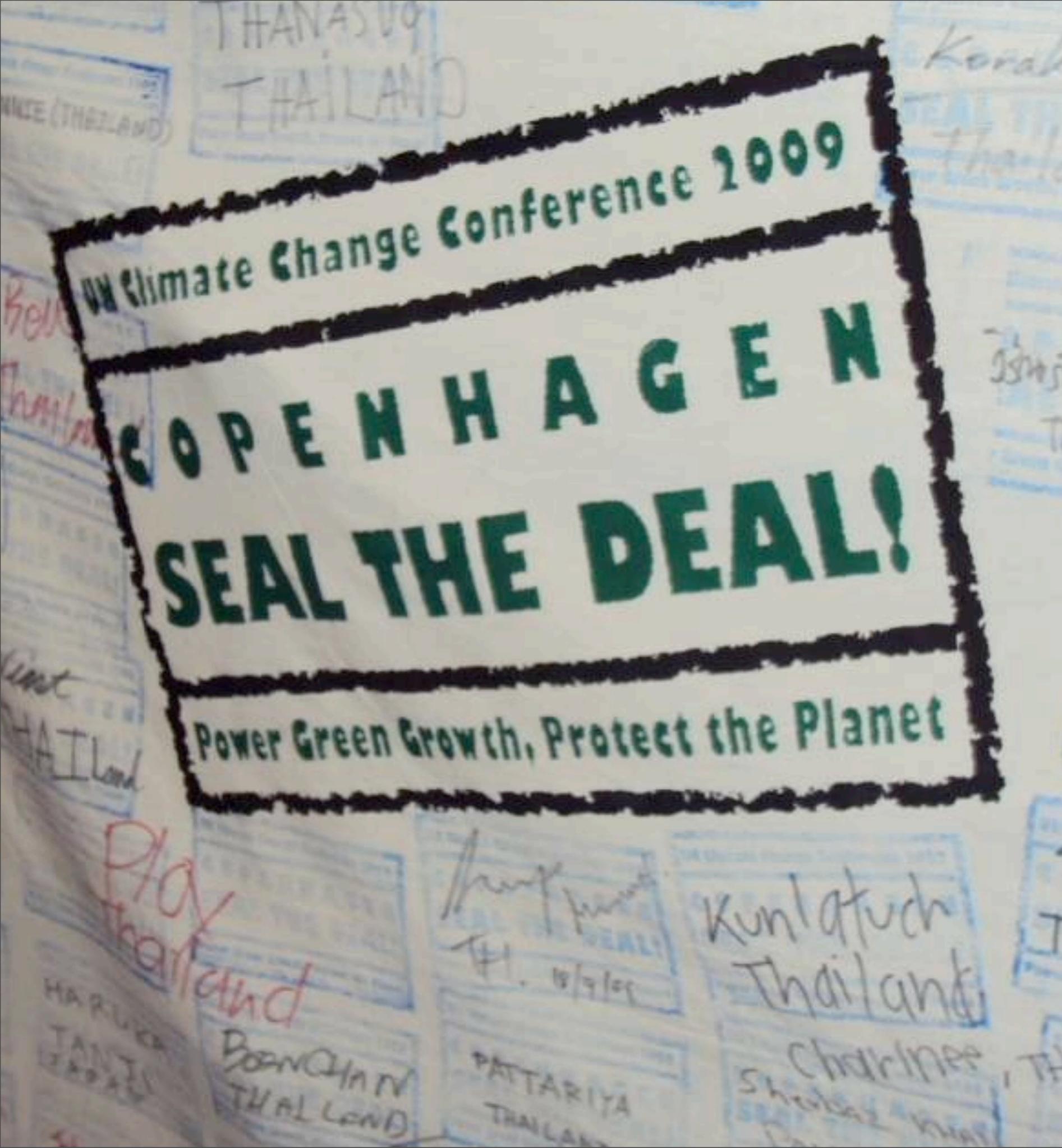




Photo: NASA

Friday, 3 December 2010





Sceptics think they had a win.....

Big polluters emboldened

Opposition delighted – justified in defeating CPRS

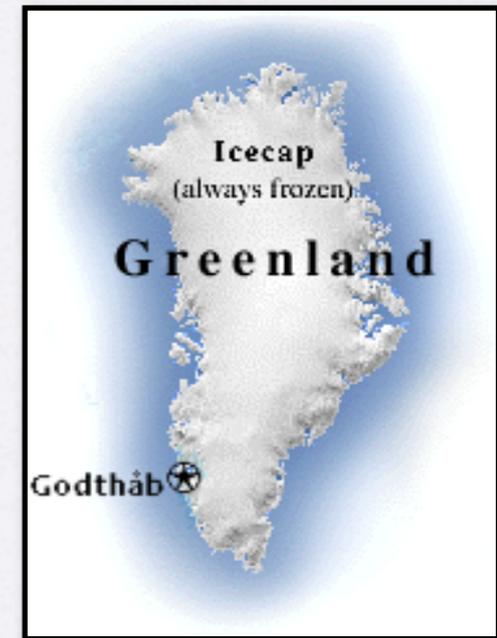


Friday, 3 December 2010



The Greenland ice cap

- Land ice on Greenland
= 1,833,900 sq.km
- or 85% of Greenland.



- 3 km thick = 4,587,750 cubic kms of ice currently out of water
- * (= 8% of the world's fresh-water).
- As it melts water shrinks by 8%, so volume of water going into the oceans would be 4,220,730 cubic kms.

The Greenland ice cap

- Surface area of the earth = 510,065,600 sqkm
- 70% is sea = 361,126,400 sqkm.
- Simple formula:

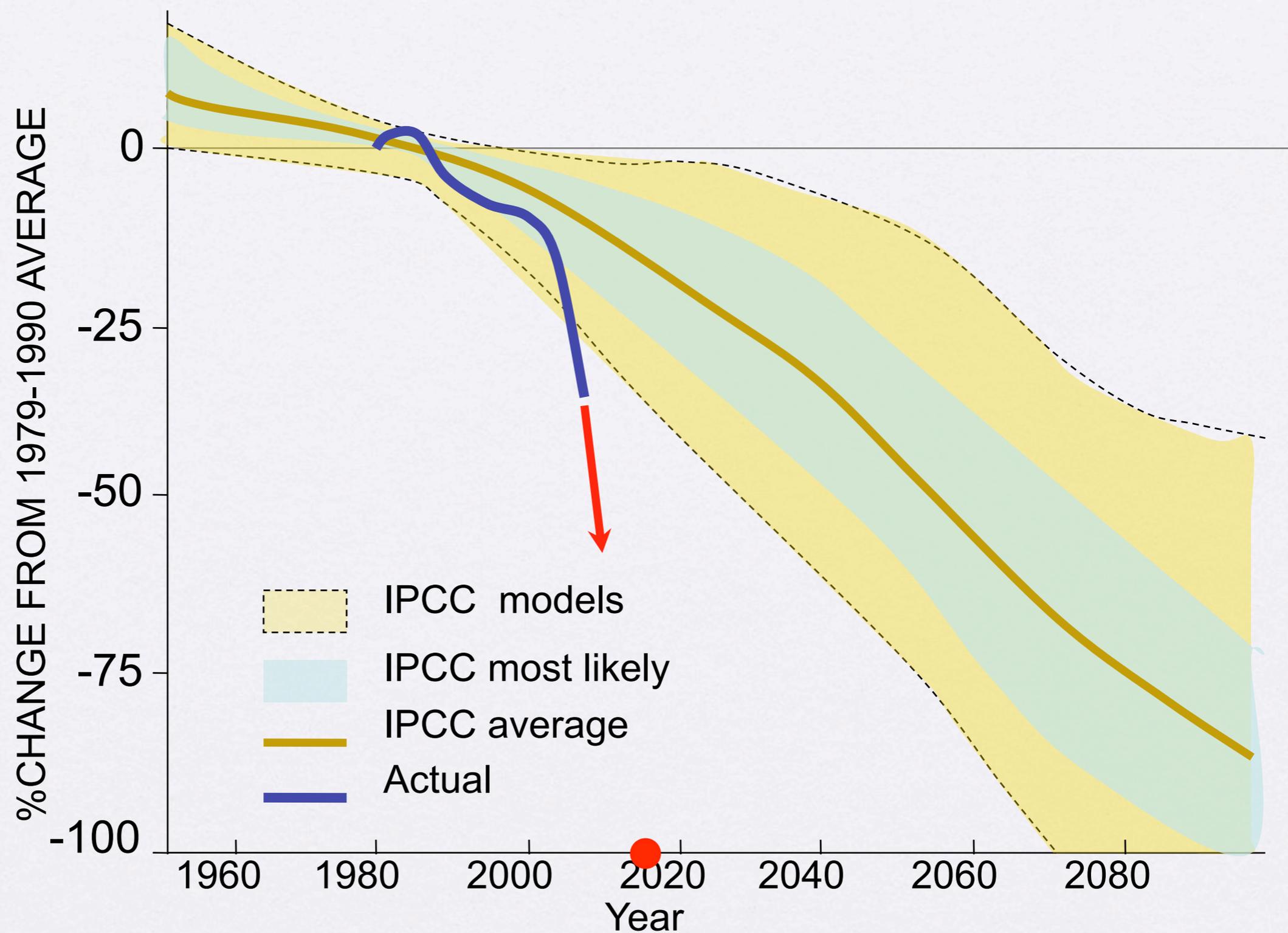
$$361,126,400 * x = 4,220,730$$

- giving $x = 0.0116876$ Km, or **11.687m** of (vertical sided) sea level rise.

As much of this rise would flood land and increase the earth's surface water area expect the sea level rise to be somewhat less,

say about 7m rise
from a total Greenland ice melt.

ARCTIC SEA ICE LOSS



Reality is much worse than the IPCC's worst prediction.

Compounding Storm events with sea level rise.....



Melbourne CBD



Photo: Fairfax photos

**SO,
WHY ARE WE
NOT
GETTING
TRACTION?**

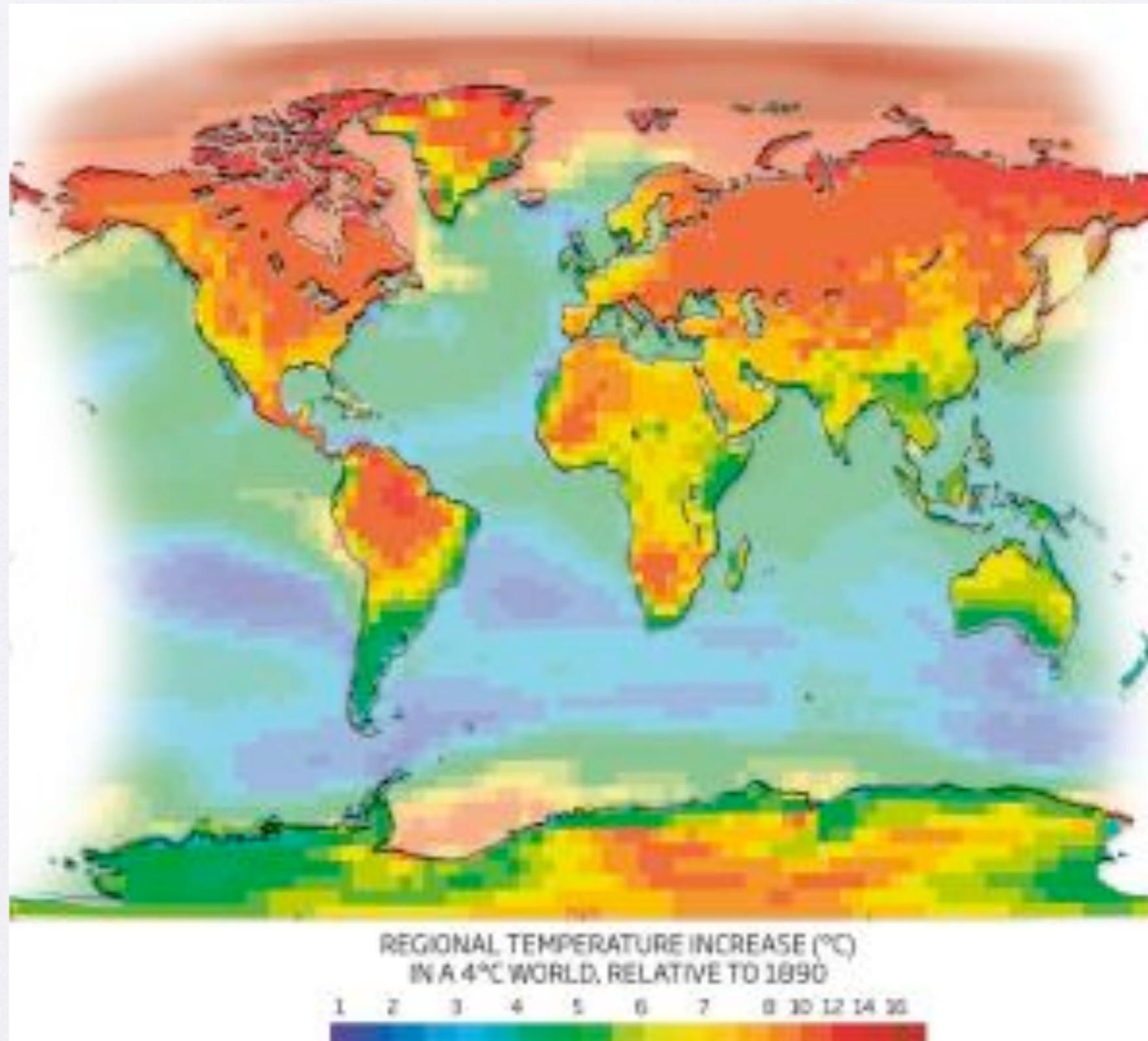
- **We're too small to make a difference;**
- **Task is just too big;**
- **We are all too comfortable;**
- **Cognitive Dissonance;**
- **Fear of political blame for increasing costs; and**
- **Disconnected from nature.**

**So what's all this got to do
with our
Built Environments?**

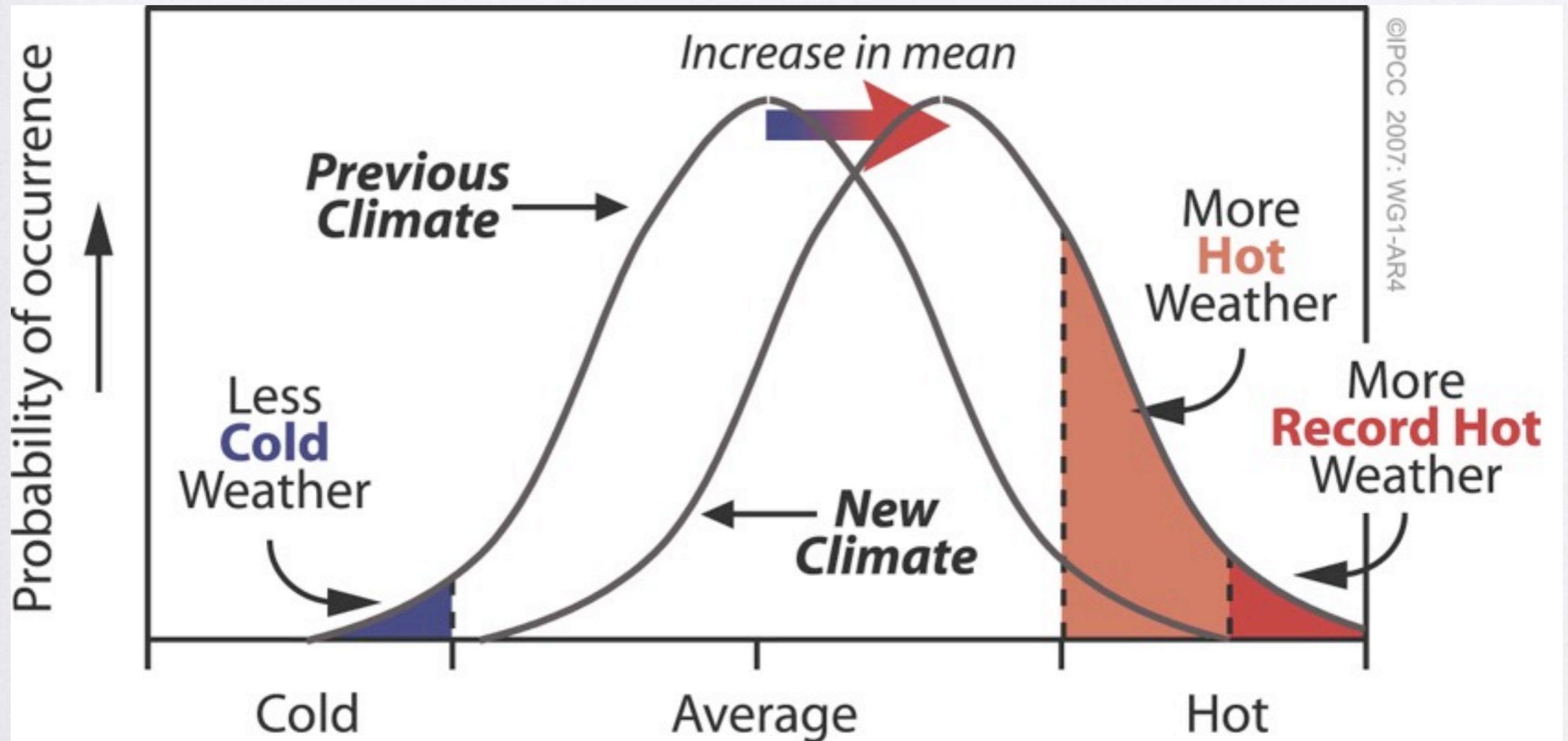
What's all this got to do with built environments?

- ***Increasing temperatures;***
- ***Increased frequency of weather events;***
- ***Increased intensity of storm events;***
- ***Increased streamflow;***
- ***Emergency access impacted;***
- ***Sea level rise;***
- ***Salt water intrusion;***
- ***Ocean acidification; and***
- ***Insurance coverage diminished***

IPCC Forecast temperatures with 4°C average global rise



2 Degree rise in global average - so what? That, and more, happens every day?

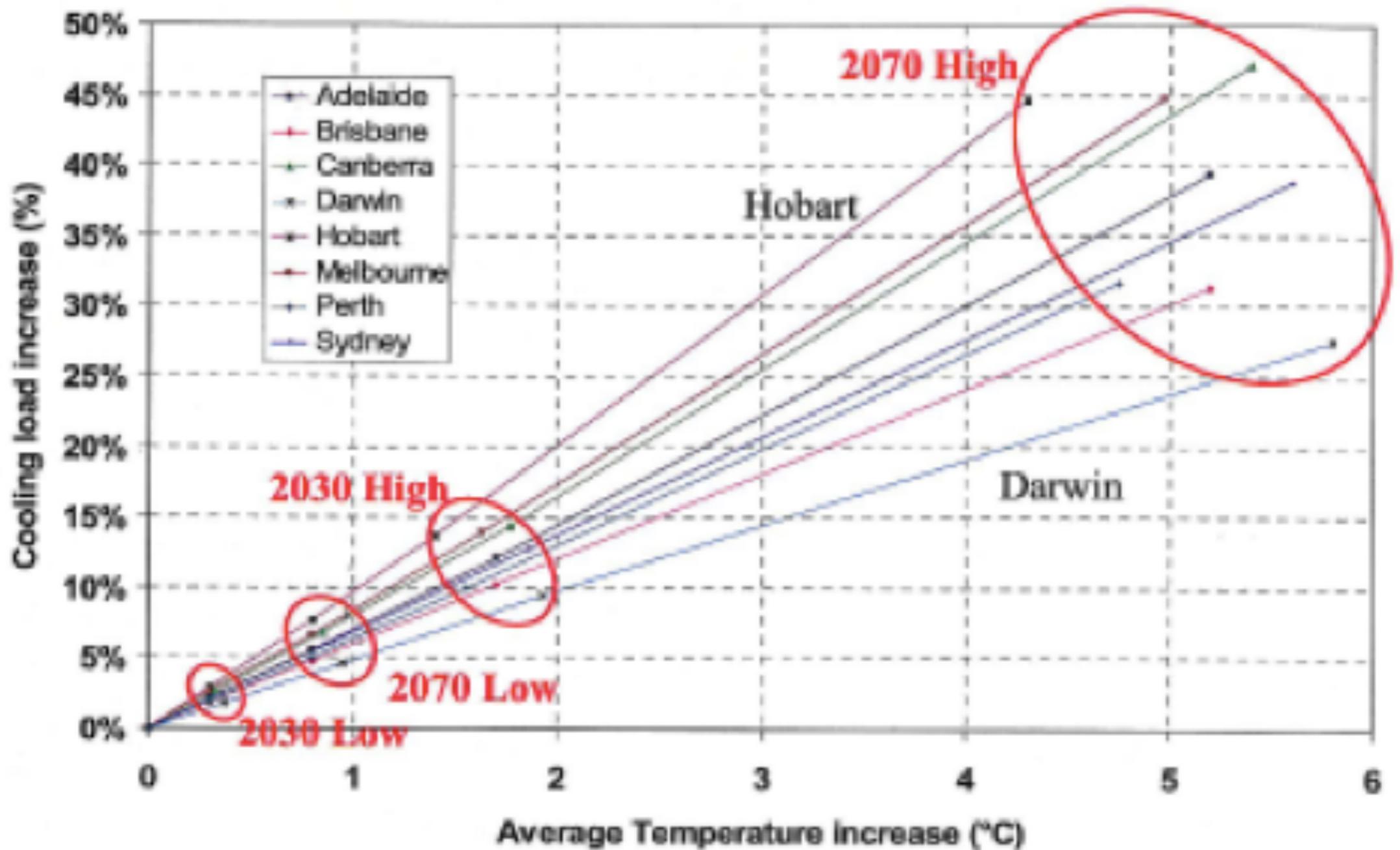


A small change in the average of a variable can have a disproportionate influence on the frequency of extreme events of that variable.

2°C shift results in a 26% increase severe discomfort

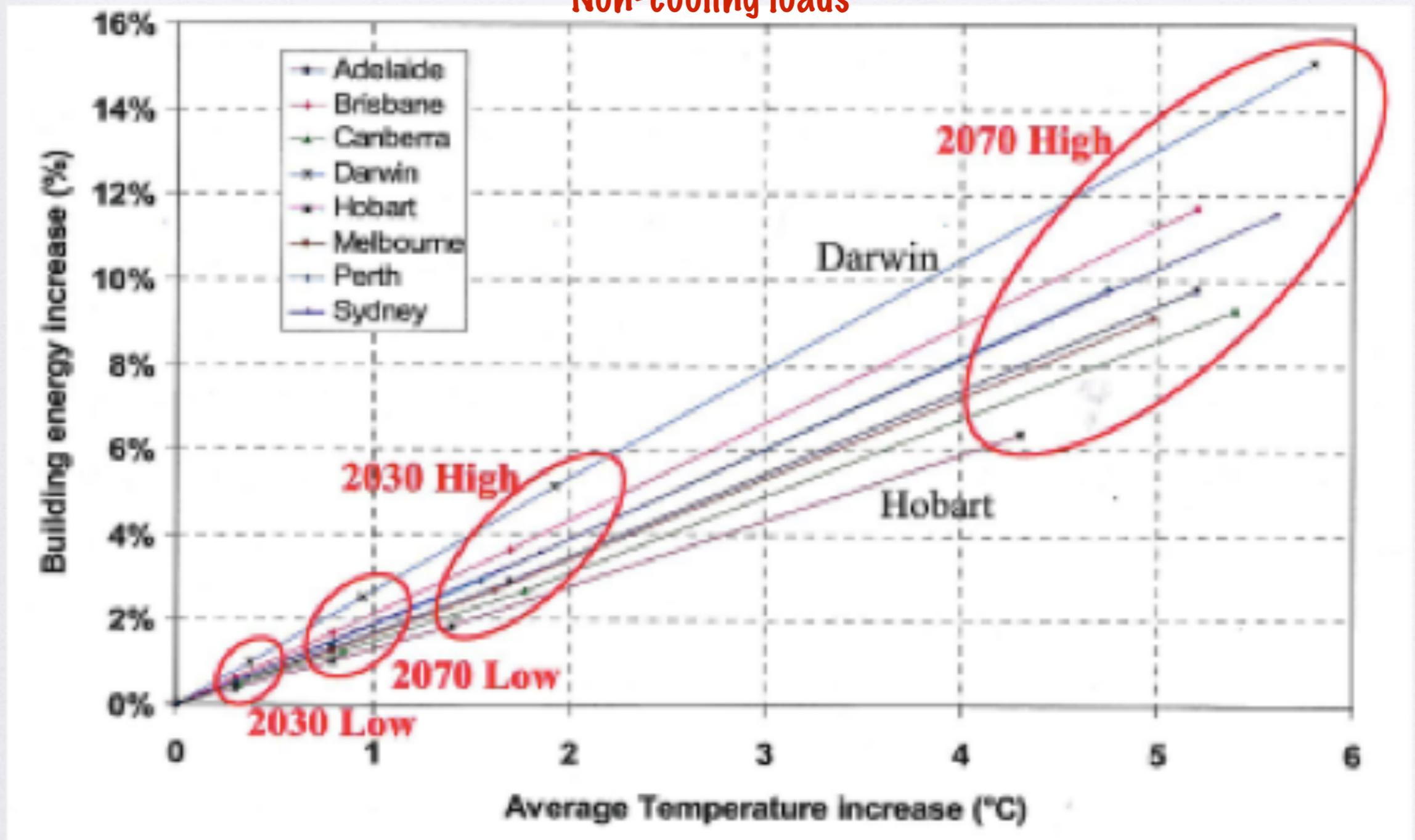
Future temperature increases will increase energy consumption

Cooling loads



Future temperature increases will increase energy consumption

Non-cooling loads



**“You cannot solve a
problem with the same
thinking that created
that problem.”**

Albert Einstein

How do you see this?

Mechanical Engineer

- Moving parts of tree
- Vibrations of branches
- Fluid analysis of sap

Environmental Engineer

Resource

Erosion control

Shelter

Chemical Engineer

- Numerous chemical process
- Photosynthesis process
- Energy source

Aesthetic value

Soil recondition & humus

producer

Carbon sink & oxygen source

Component of unique ecosystem

Civil & Structural Engineer

- Land rehabilitator
- Electrical Engineer material
- Lighting conductor
- Strength of the material
- Copying photosynthesis process to electricity
- Beams/column/girders
- Water pollution control (biominicry)
- Static from wind

Land rehabilitator

Earth stabilisation

Water pollution control

(biominicry)

- Static from wind

Historical or social significance

Environmental Scientist

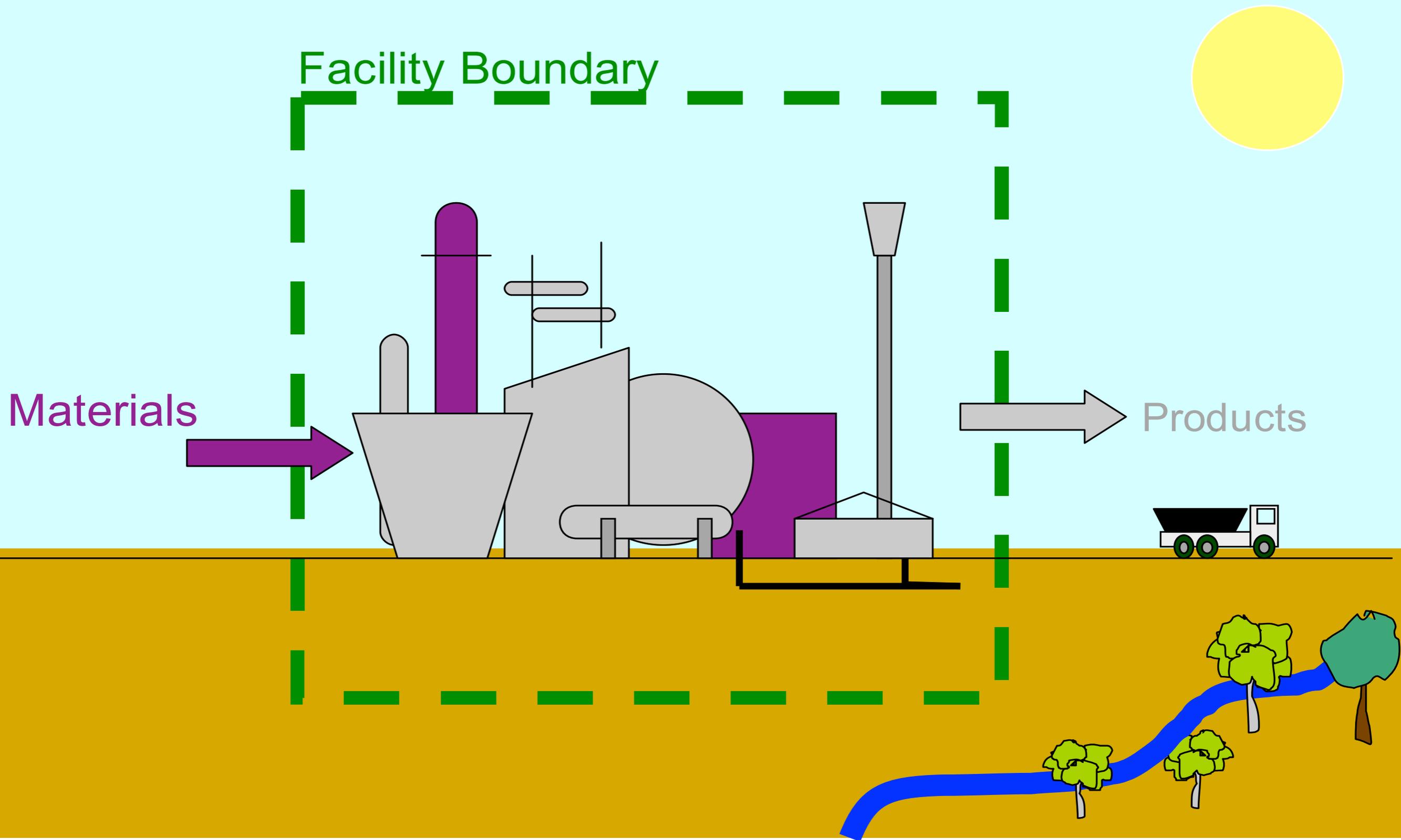
- Natural habitat cleanser
- Aesthetics
- Historical value

Air and water

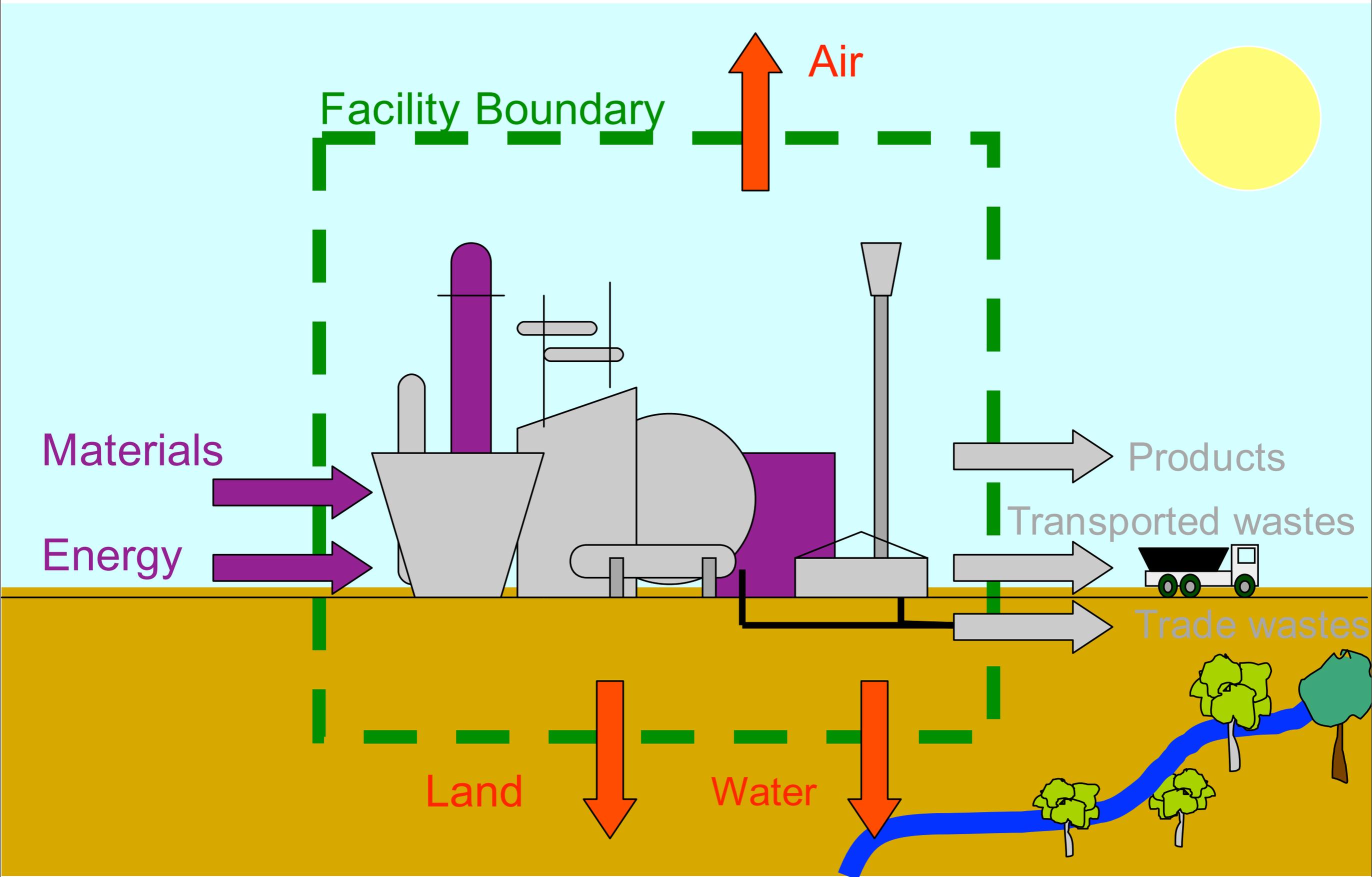
cleanser



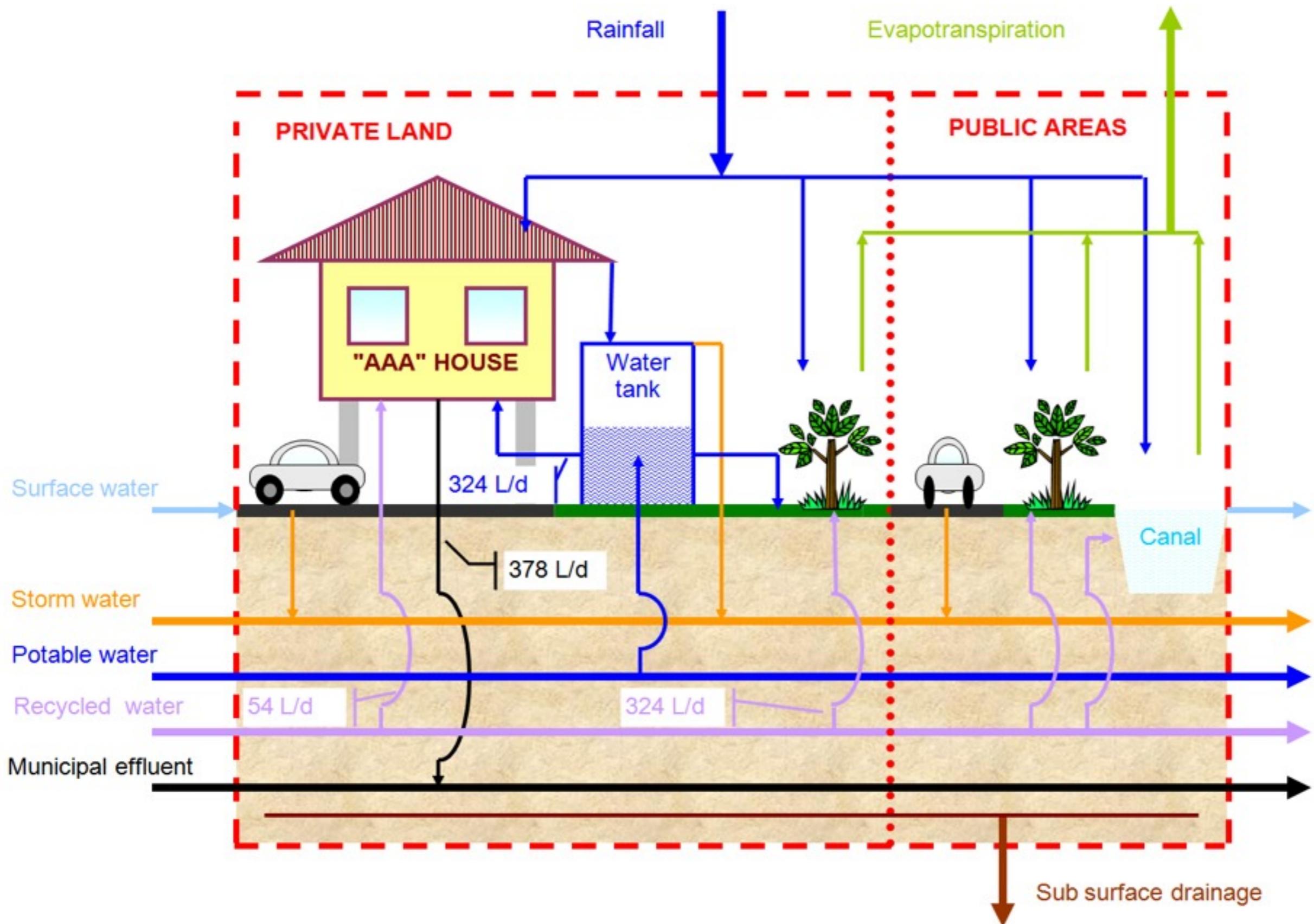
Facilities “typical” operations perspective



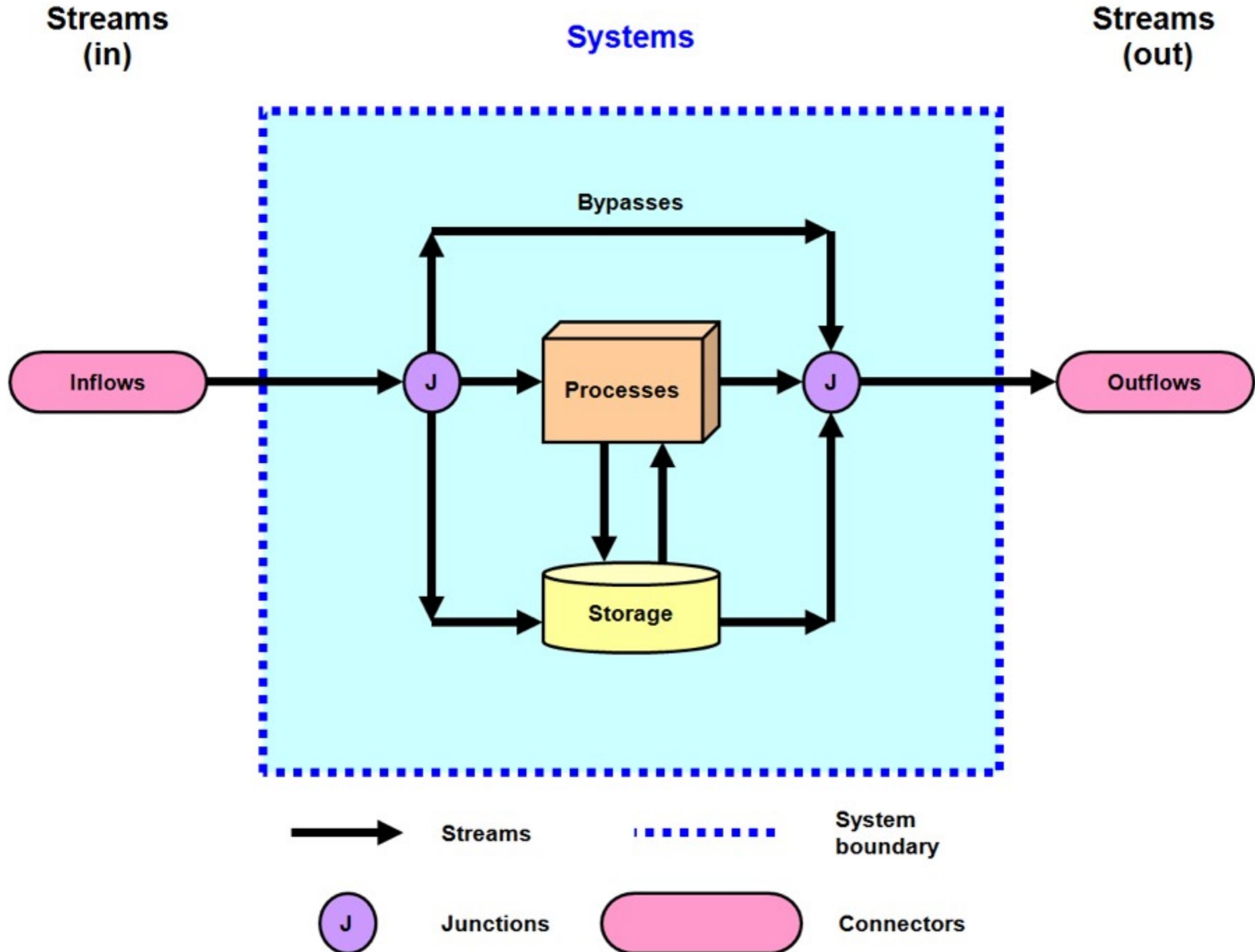
Facilities an environmental perspective



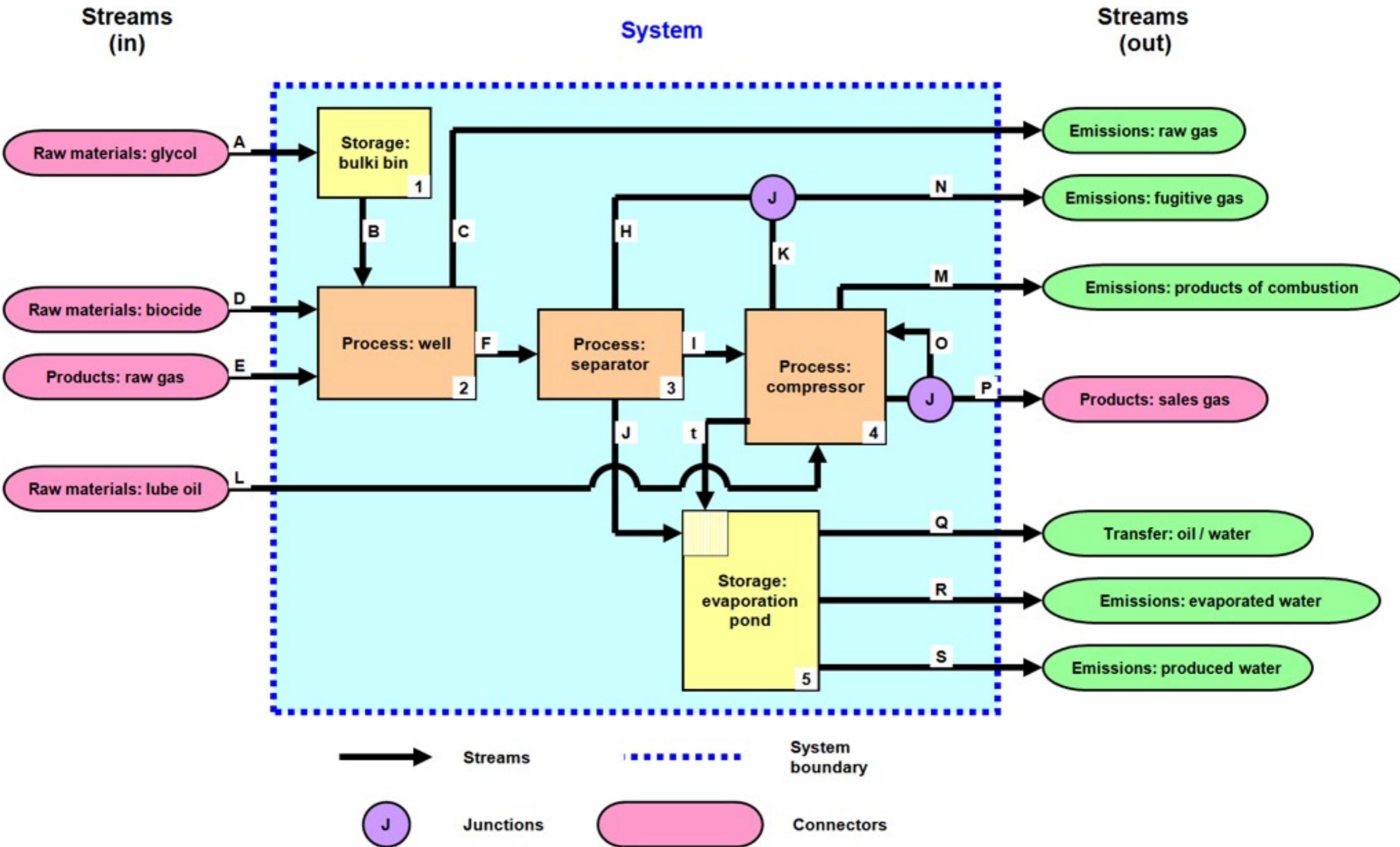
Suburban water recycling (water saving options)



Engineering Systems - an engineering tool

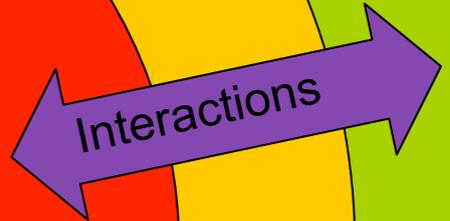
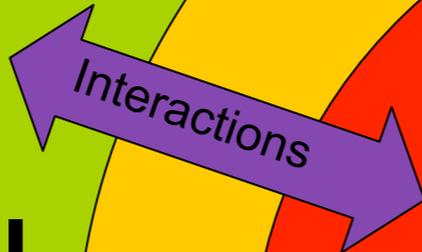


Plant scale engineering systems analysis

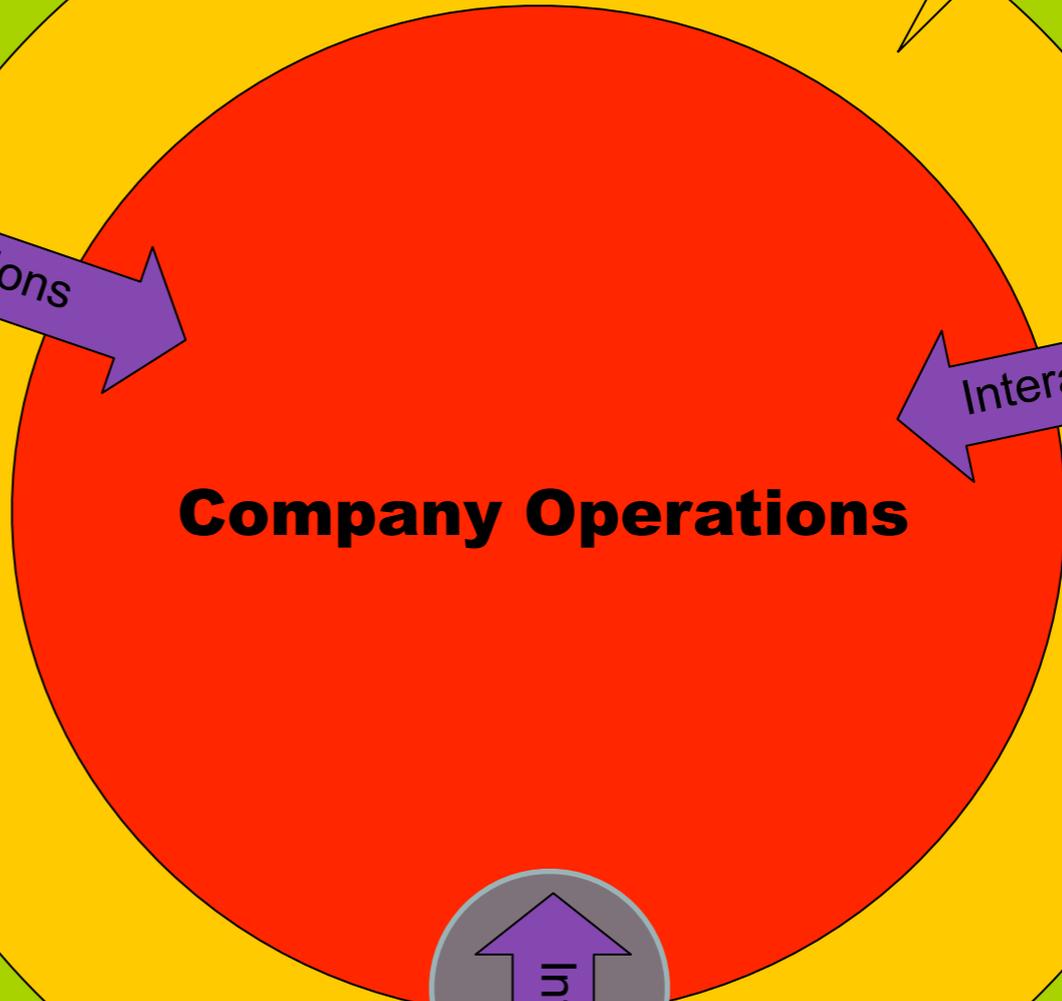


Global Environmental Management

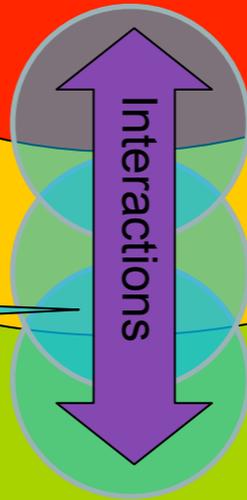
Local Environment & Community



Environmental Management & Engineering

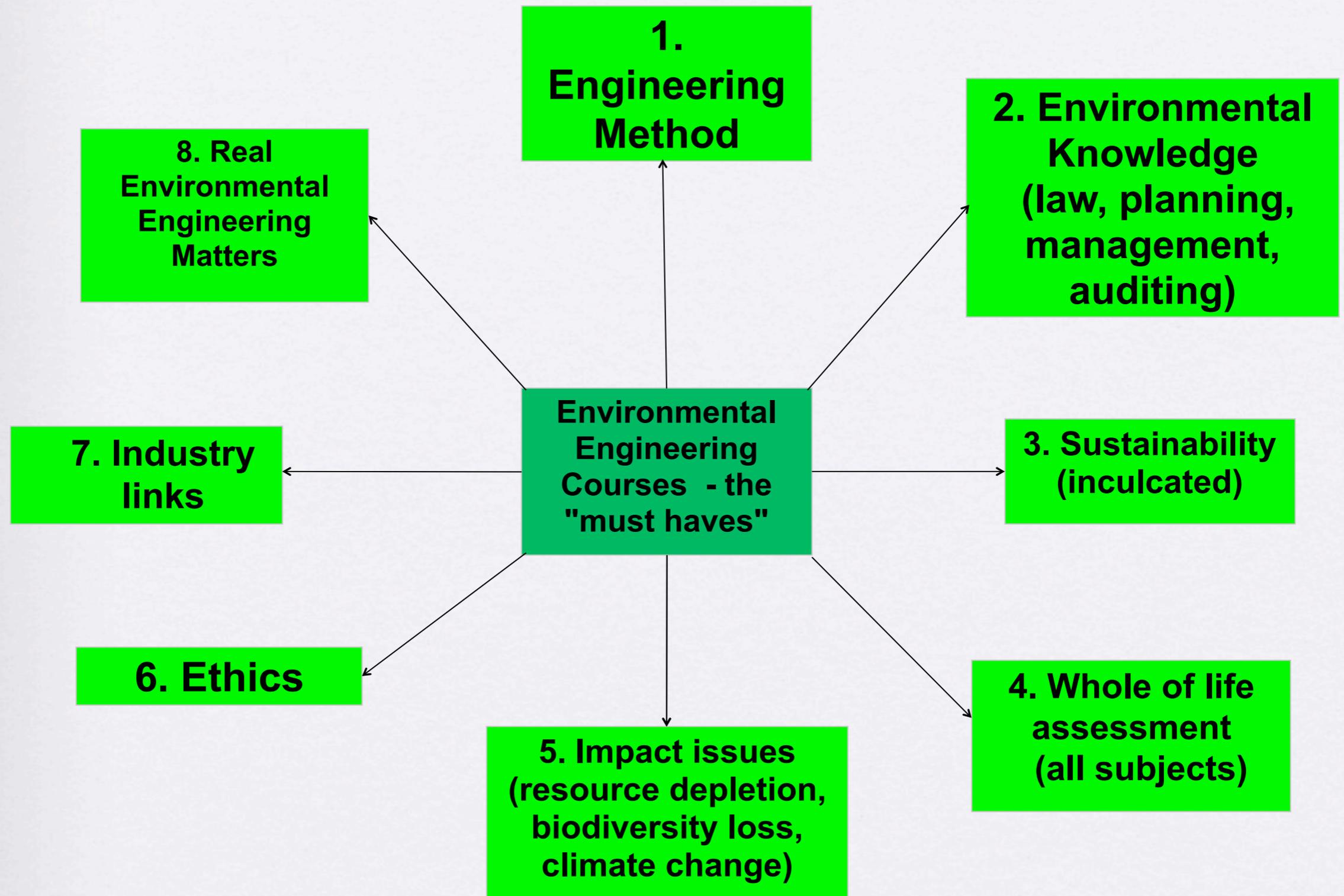


Environmental managers work and facilitate at the interface between human activity, the community and the environment.



Environmental Engineering

“Must Haves”



Practice Competency Standards

Why are enthusiastic young people not getting to leadership positions.....

EA has this thing called **Chartered Engineering Executive:**

- 200 competency elements - 22 on finance skills
- one on environmental management - compliance
- One on social and it's elective.....

All **CPEng** and **CEngExec** are required to undertake CPD (audited)

- Risk studies
- Management studies

Welcome to the
Australian Green Infrastructure Council



A Sustainability Rating Scheme for Infrastructure in Australia



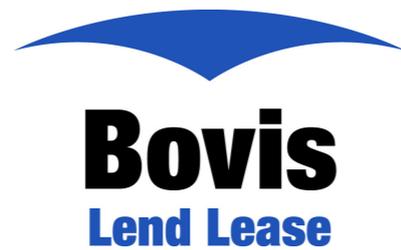
Foundation Members



CLIENTS | PEOPLE | PERFORMANCE



Dedicated to a better Brisbane



Organisational Members



Organisational Members



AUSTRALIAN STEEL INSTITUTE



BAULDERSTONE



PLUS - xxx, xxx, xxx, xxx in past month.



Objectives of AGIC

- Be Australia's principal coalition of leaders in promoting sustainable infrastructure
- Develop and encourage dissemination and development of knowledge
- Act as lead partner in research into sustainable infrastructure and evaluation metrics
- Support, encourage and assist in the development of Education and research
- Participate in public debate on sustainability issues with infrastructure
- Be a successful organisation



Scheme Objectives

- Develop and operate a scheme to:
- Establish sustainability performance benchmarks (environmental, social and economic) for Australian conditions
- Raise the standards of sustainability in design, construction and operation of infrastructure
- Verify and reward projects and their stakeholders for high achievements and outcomes
- Provide a training and reference **tool** for industry



Development Timeline



Infrastructure Types

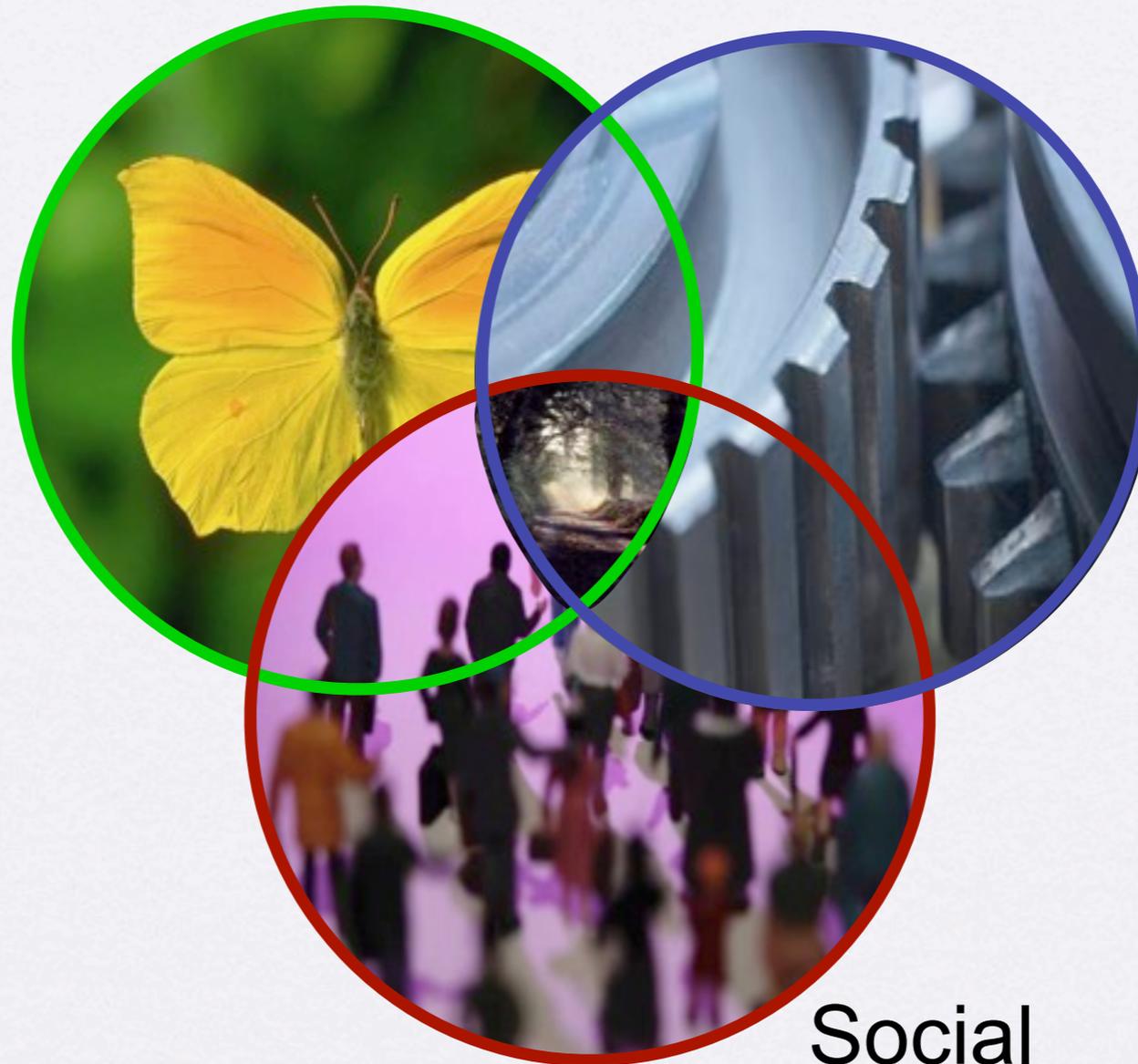


- Roads and tunnels
- Railways and bridges
- Airports
- Ports and marinas
- Cycle and pedestrian pathways
- Telecommunication infrastructure
- Water collection, distribution and treatment infrastructure
- Distribution grids (poles, wires, pipes)
- Other civil engineering headworks

NOT BUILDINGS — AGIC and GBCA have agreement, and MoU.

Full Sustainability Coverage

Natural
Capital



Economic
Capital

Social
Capital

MAUNSELL | AECOM

Assessment Themes

1. **Project Management & Governance.**
2. **Economic Performance.**
3. **Using Resources.**
4. **Emissions, Pollution & Waste.**
5. **Biodiversity.**
6. **People & Place.**
7. **Workforce.**



A total of 27 categories within the 7 themes above were developed through industry engagement and AGIC working groups.

Scheme Coverage

Master Planning

Environmental
Impact Assessment

Project Approval

Design

Construction

**Operation &
Maintenance**

AGIC Rating Scheme

Award Stages



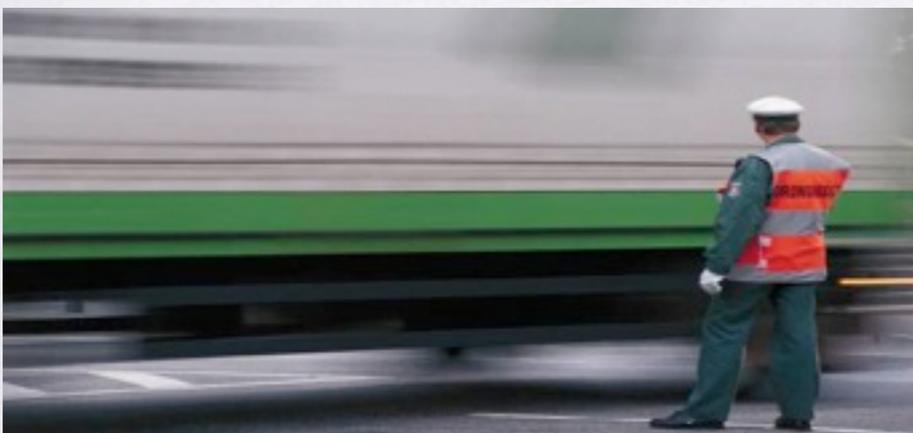
● Design

Interim Project Rating



● Construct

Project Rating

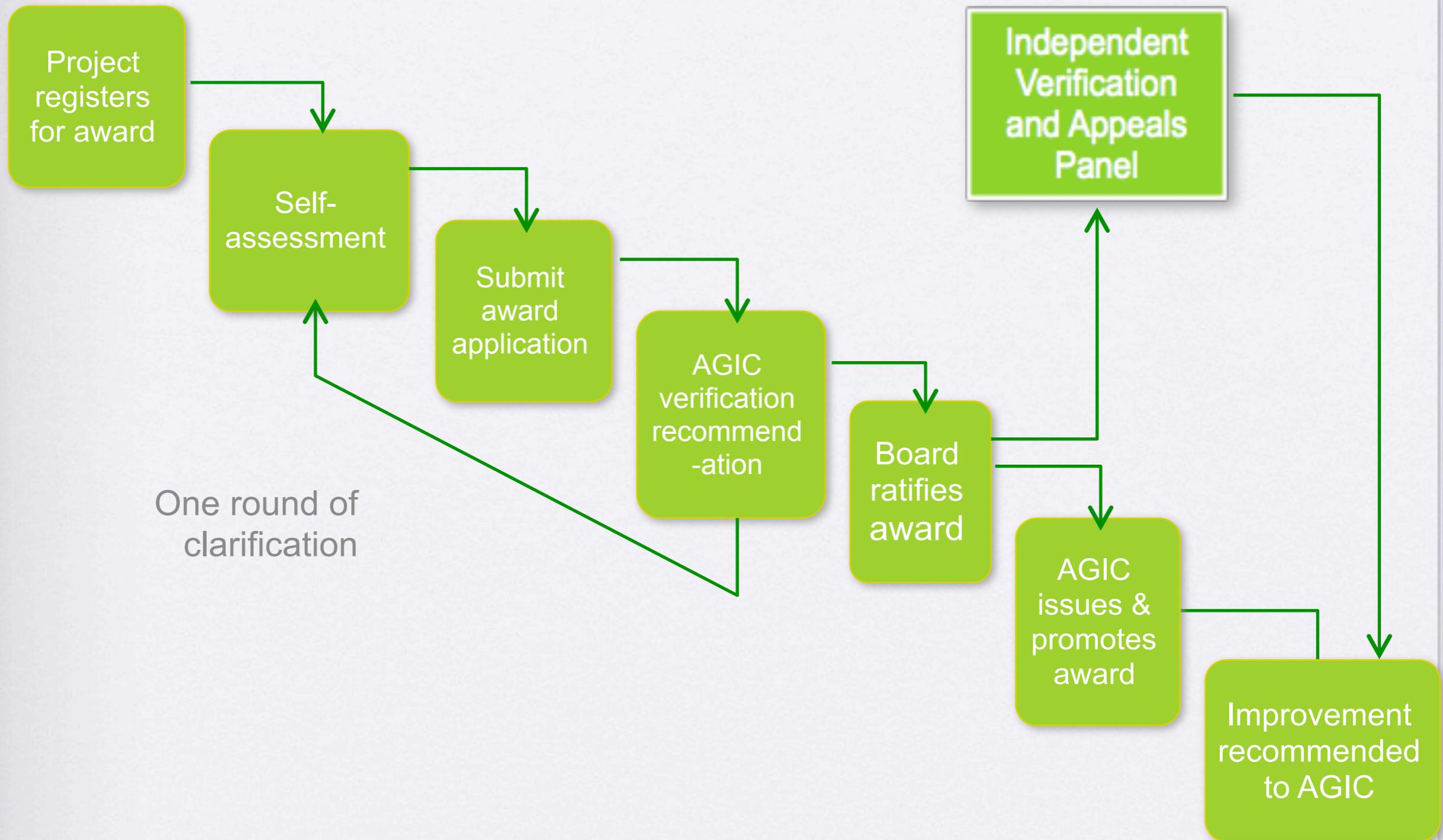


● Operate and Maintain

Infrastructure Rating

(Badging yet to be decided)

Assessment Concept



Welcome to the
Australian Green Infrastructure Council



www.agic.net.au



Thank You

