

*James Pitt*

# *Beyond sustainability? The Circular Economy and closed-loop design*

*NAAIDT May 2011*



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# Resource Scarcity

**Some Key resources will be exhausted more quickly if predicted new technologies and the population grows**

ANTIMONY 15-20 years

SILVER 15 - 20 years

PLATINUM 15 years

URANIUM 30-40 years

HAFNIUM ~ 10 years

INDIUM 5-10 years

ZINC 20-30 years



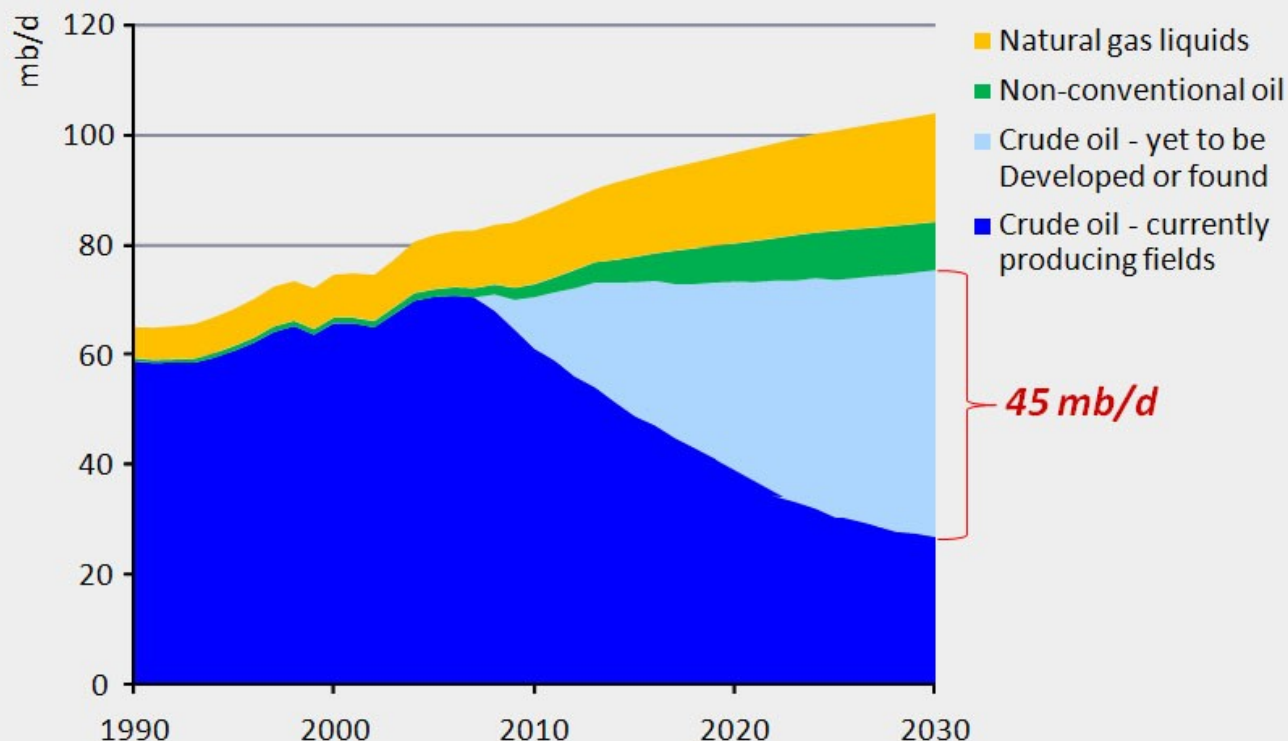
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(From New Scientist - Oct 2008)

# World oil production by source in the Reference Scenario

World  
Energy  
Outlook  
2008



*Even if oil demand was to remain flat to 2030, 45 mb/d of gross capacity – roughly four times the capacity of Saudi Arabia – would be needed just to offset decline from existing fields.*

© OECD/IEA - 2009



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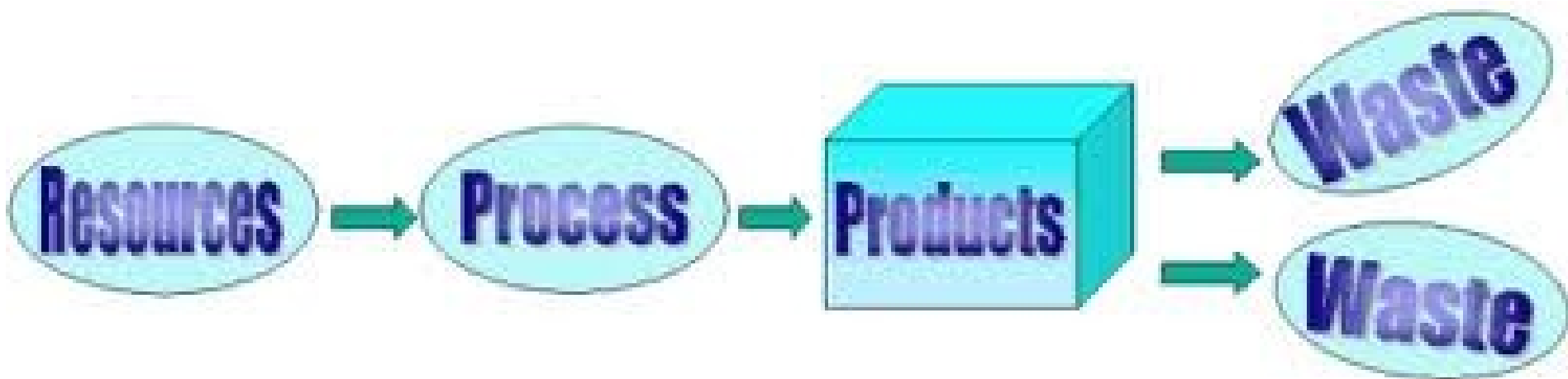
Proton

Liberty

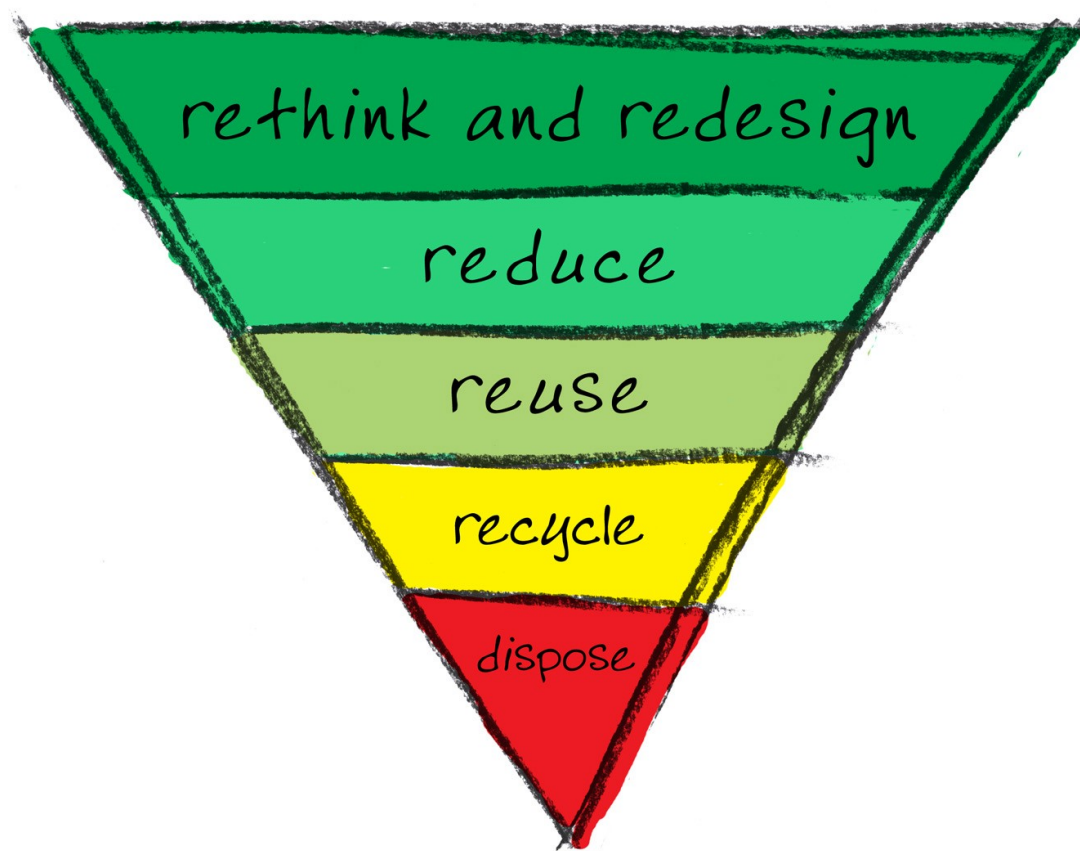




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## 'Linear economy'

Take - Make - Dump

Technical and biological  
nutrients all mixed up



something useful



toxic  
waste

## 'Circular economy'

Technical nutrients

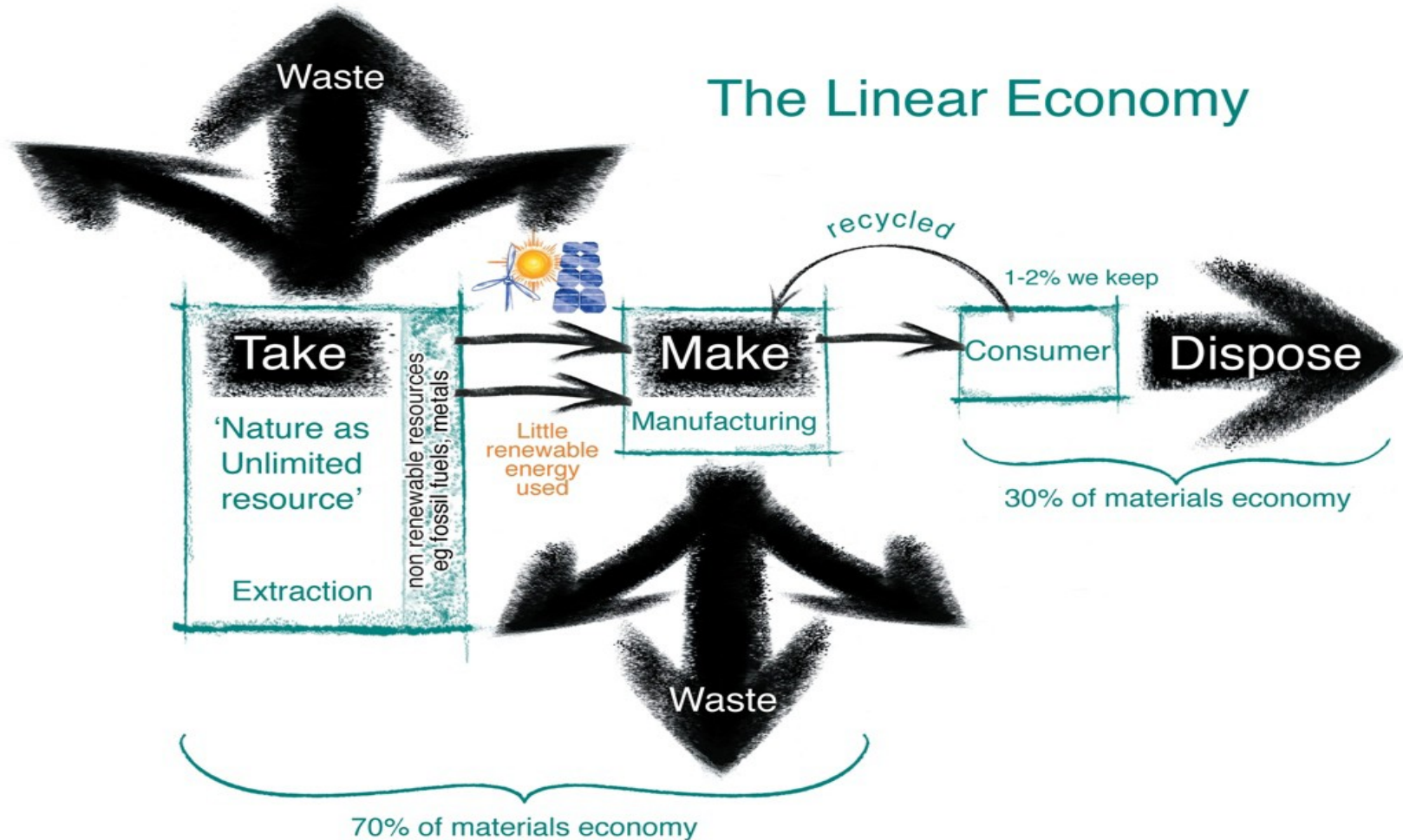
Biological nutrients



Living systems

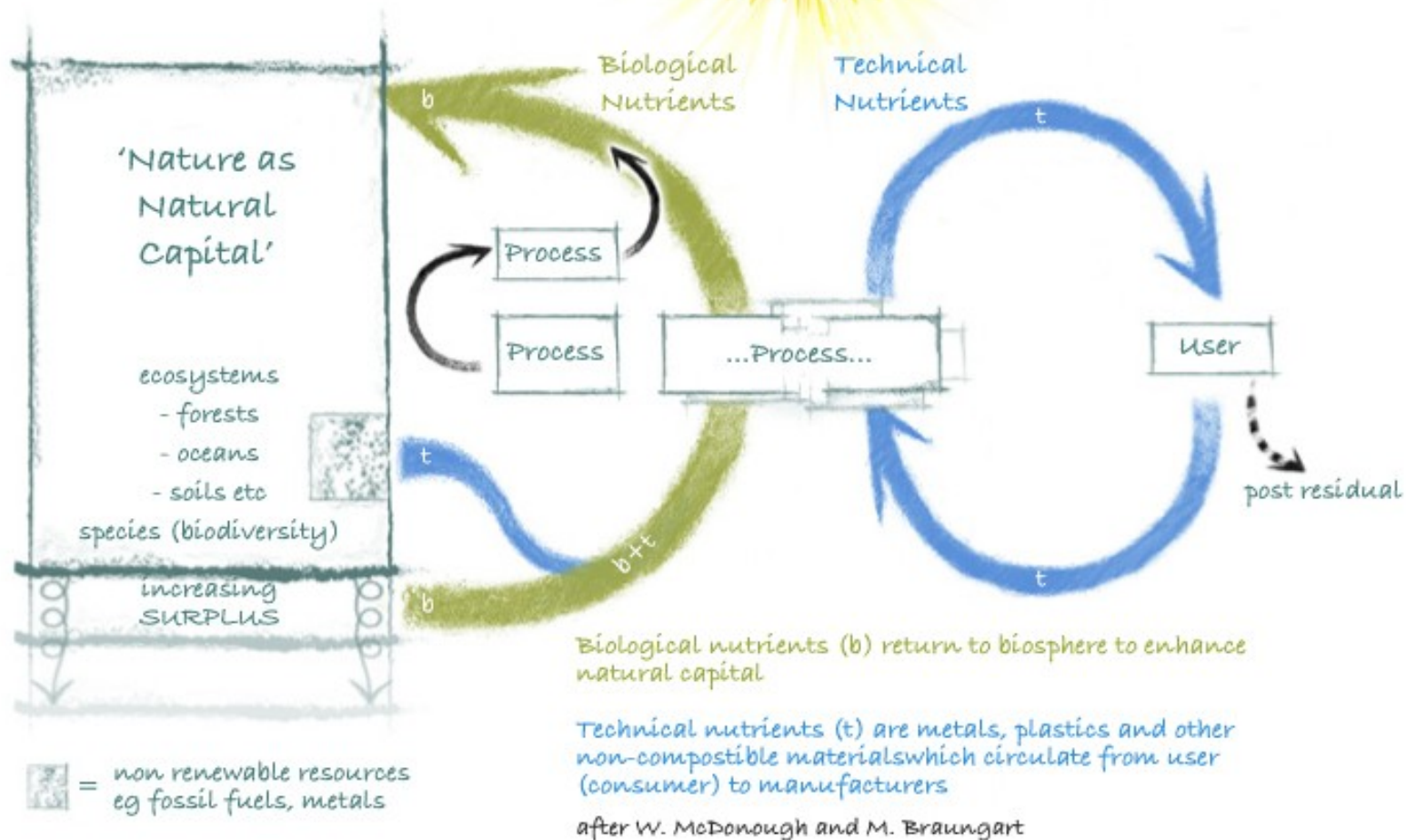
after W. McDonough and M. Braungart

# The Linear Economy





# A Circular Economy (where waste = food)



Source: 'Sense and Sustainability - Educating for a low carbon world',  
Ken Webster and Craig Johnson. TerraPreta, 2008

# Circular economy principles

Waste = Food

Live within current solar income

Celebrate diversity

Prices reflect the true cost (no hidden subsidies)



# The Herman Miller Mirra chair

It is a flexible fit

Great aesthetic appeal with a fresh new look in a wide range of colours

Allows natural movement with distributed pressure and total back support with integrated sacral support. It also provides a balanced ride from the moving spring fulcrum

96% recyclable





# Backhausen Returnity® - The fabric of many lives

100% recyclable flame retardant

Fabrics made of Trevira CS

Based on the Cradle-to-Cradle philosophy

Environmentally friendly production

- no lost raw materials / residues
- no waste
- further use

Avoidance of environmentally polluted materials



# Lewis Centre

The Lewis Centre for Environmental Studies is interesting because it makes more energy that it needs to



Switch 75We  
1100 lumens

100%

**Cradle-to-Cradle**



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# Eco-effectiveness v Eco-efficiency

**Define**

**Increase**

**Support**

**Optimise**

- Reduction
- Avoidance
- Minimisation
- Prevention

***Target is quality***

*Target is zero*

**The GREEN  
economy**

**The BLUE economy**



# Some possible lessons from living systems

Waste = food

Diversity = strength (resilience, adaptability)

Optimises not maximise

Runs on current solar energy

Reduces toxicity over time

Provides multiple benefits

Works creatively within limits

...other...?



# So what are the implications ....

For design education?

For teaching about technologies?

For pedagogy?

For D&T as a subject?

[james@ellenmacarthurfoundation.org](mailto:james@ellenmacarthurfoundation.org)







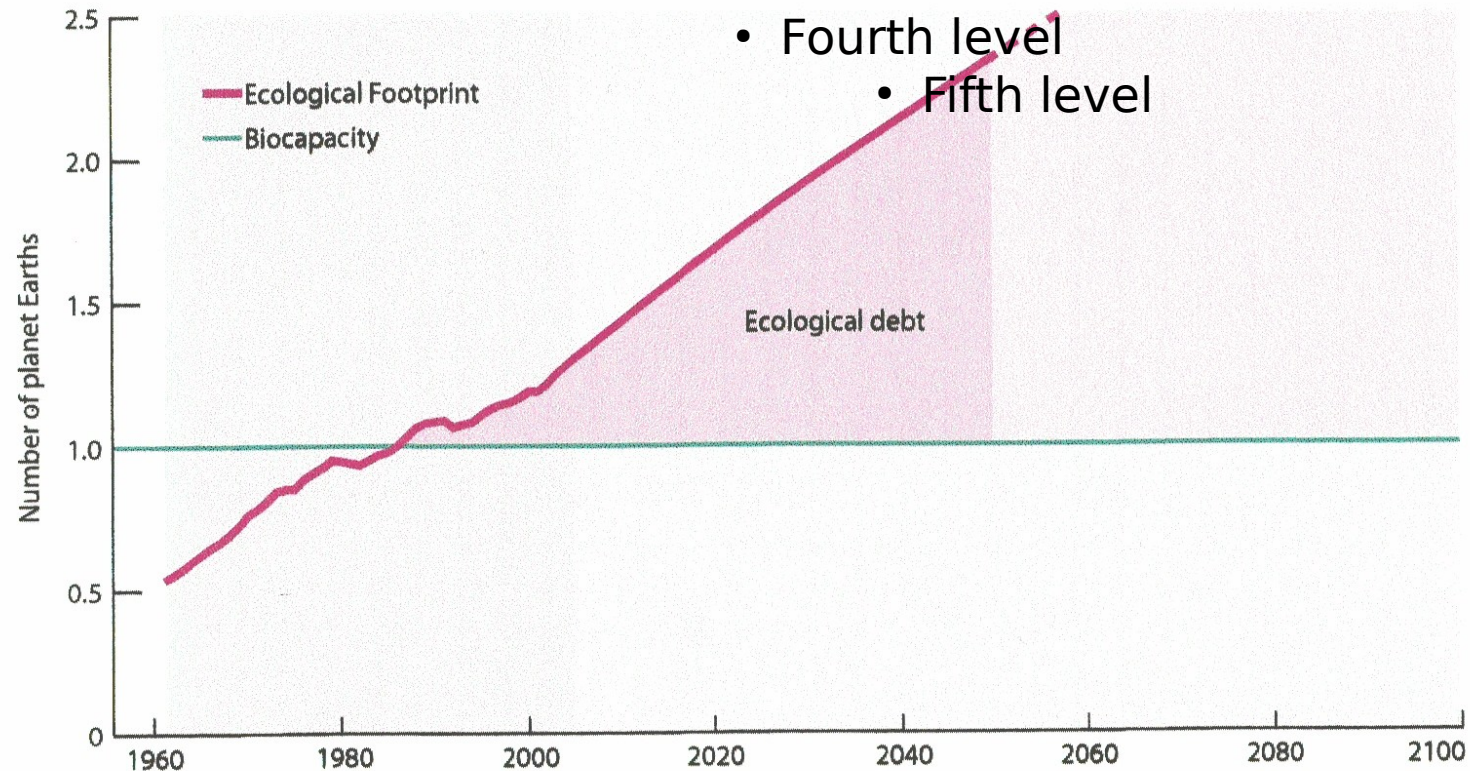
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Photo contributed by Jim Champion



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Second level

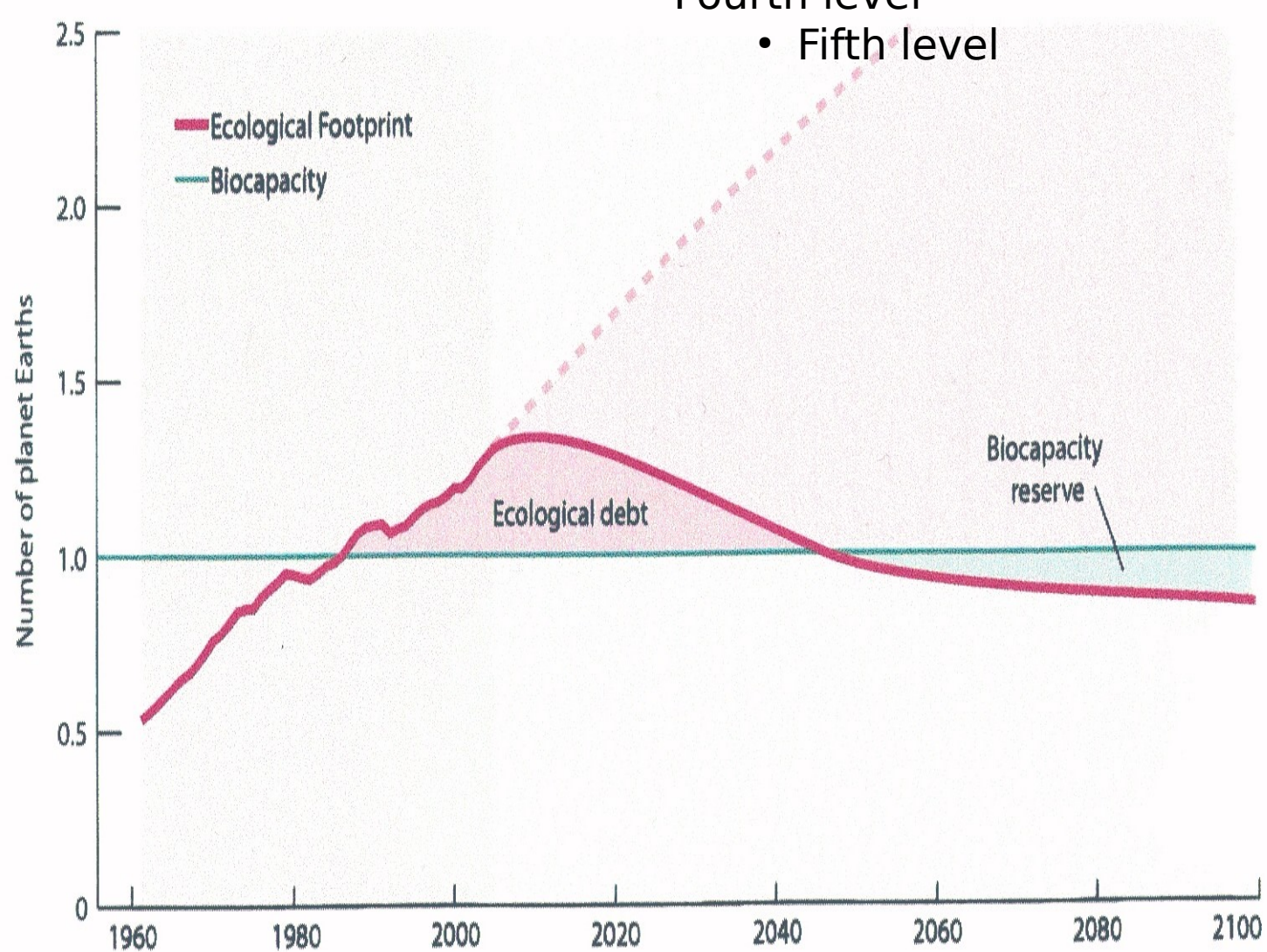
Fig. 31: BUSINESS-AS-USUAL SCENARIO AND ECOLOGICAL DEBT



*Living Planet Report 2008 - WWF*



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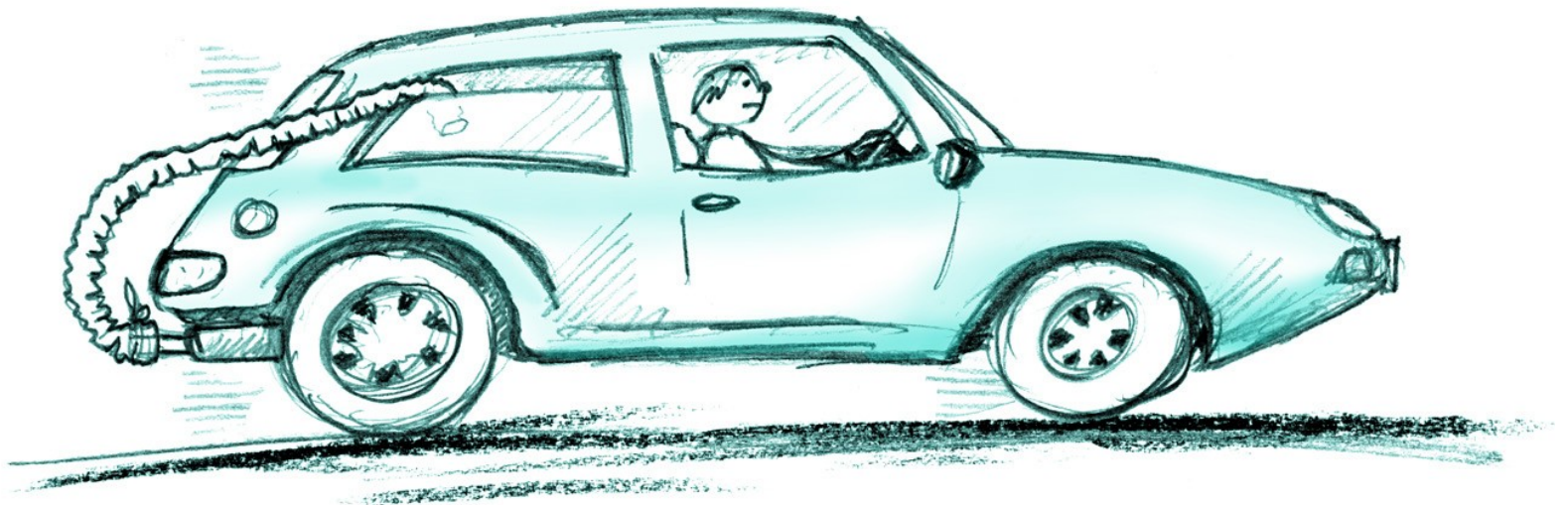


*Living Planet Report 2008 - WWF*



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One way to encourage consumer demand for clean cars :-  
close the loop and provide feedback !

