Design For Sustainability



Dr. Marcel Crul
Design for Sustainability program
Industrial Design Engineering
Delft University of Technology

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The faculty of Industrial Design Engineering

Integrating 4 disciplines

The faculty of Industrial Design Engineering

- Founded in 1969
- Largest university-based product design course worldwide
- 2000 students
- 3600 alumni
- 200 scientific staff
- 20 professors in various disciplines
- 3 departments
- 1 BSc program
- 3 MSc programs

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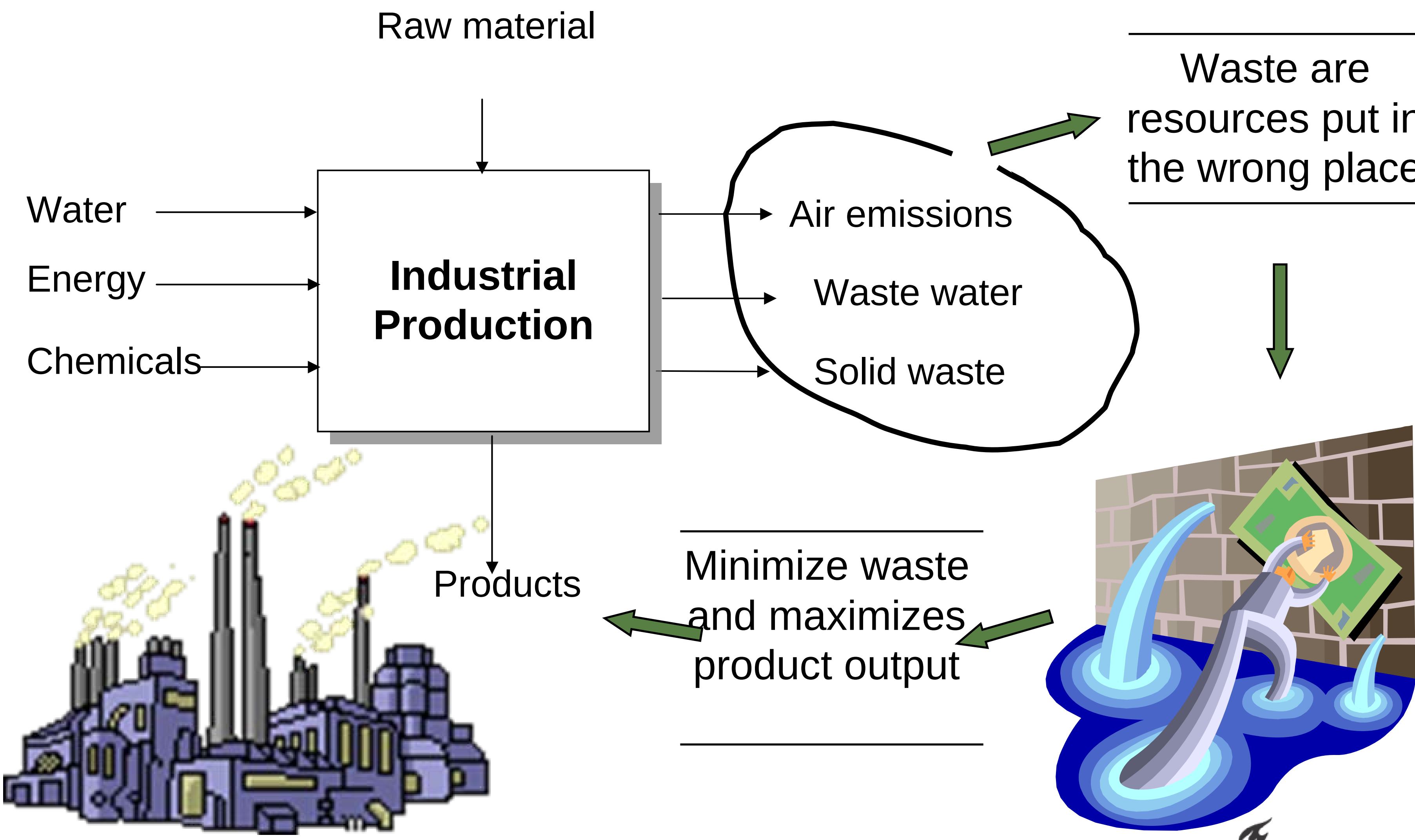
- What is Design for Sustainability
- Practical approach
- Further developments

Why product focus?



D4S is focused on improving products:

Development and production of (new) products that are

Better for people and society,

Have less impact on the environment

Are profitable for industry and community

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People: Social and cultural aspects

- Health and safety
- Human resource management
- Equity and justice
- Local economic growth
- Community development
- Regional development
- Corporate social responsibility

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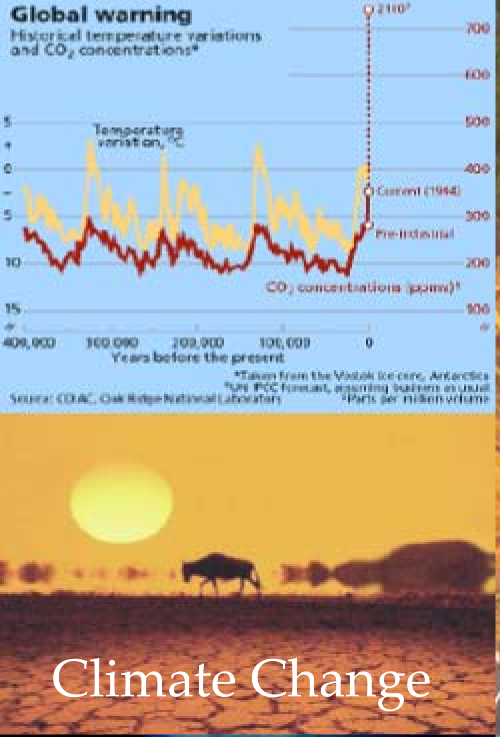
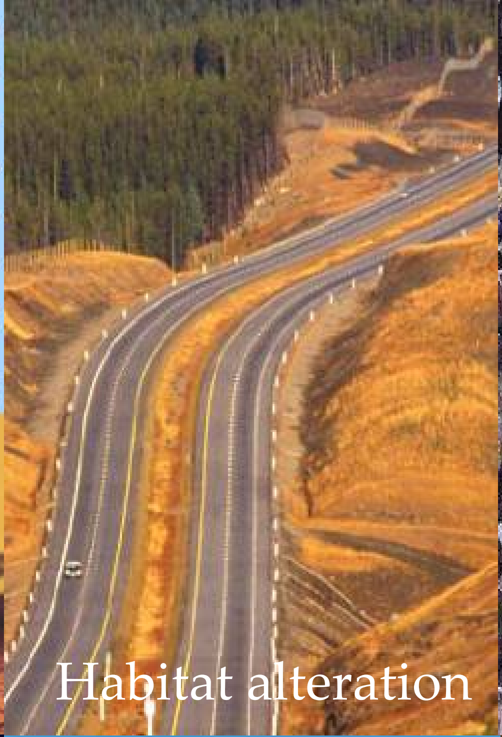
Planet: Improve environmental performance of your product

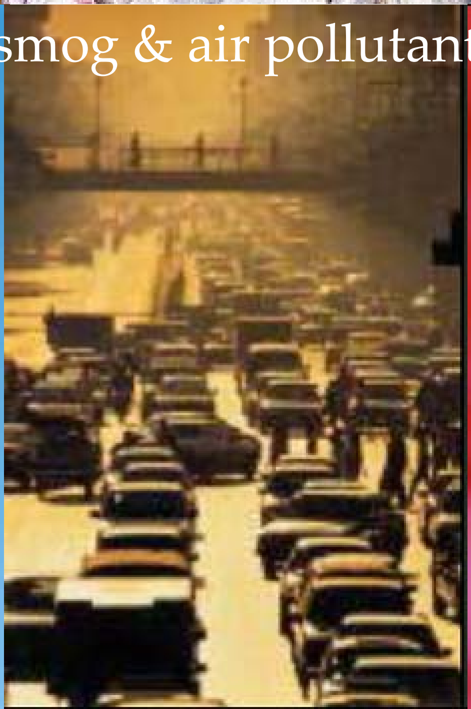
- Reduce ecological effects; human health effects; resource depletion
- Life cycle approach


Global warming
Historical temperature variations and CO_2 concentrations*
Temperature variation, °C
CO_2 concentrations (ppm)
Years before the present
Climate Change

Habitat alteration

Waste

Water eutrofication

Ozone depletion

Water shortage

smog & air pollutants

Fossil fuels

Profit

- Profitability for local, national and multinational industry
- Local and regional economic growth
- Value creation for customers
- Partnerships and co-operation
- Market position and competitiveness
- Long term business development

Demands for Sustainability

We pay a lot for the sustainability attributes (good blends), e.g.

- **Bottled water 50x more expensive than tapwater**
- **City gardens 100x more than rural**
- **‘Health’ food fastest growing food**
- **Billions for wellness, “slow” leisure**
- **National Parks up to € 150/visitor**
- **Ecotourism**
- **Discovery channel**

Why industry does D4S

- Cost reduction (in production, for the customer)
- Increase market share (new or existing markets)
- Improve image
- Quality improvement
- Customers demand
- Regulation (existing or new legislation
- Pressure environmental/social groups
- Competitive advantage – ready for the future
- Innovation and creativity

- Not just doing things better
  – but Doing the right thing !

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Current projects of D4S in Europe:

- Mobility
- Materials
- Energy
- Water
- Housing

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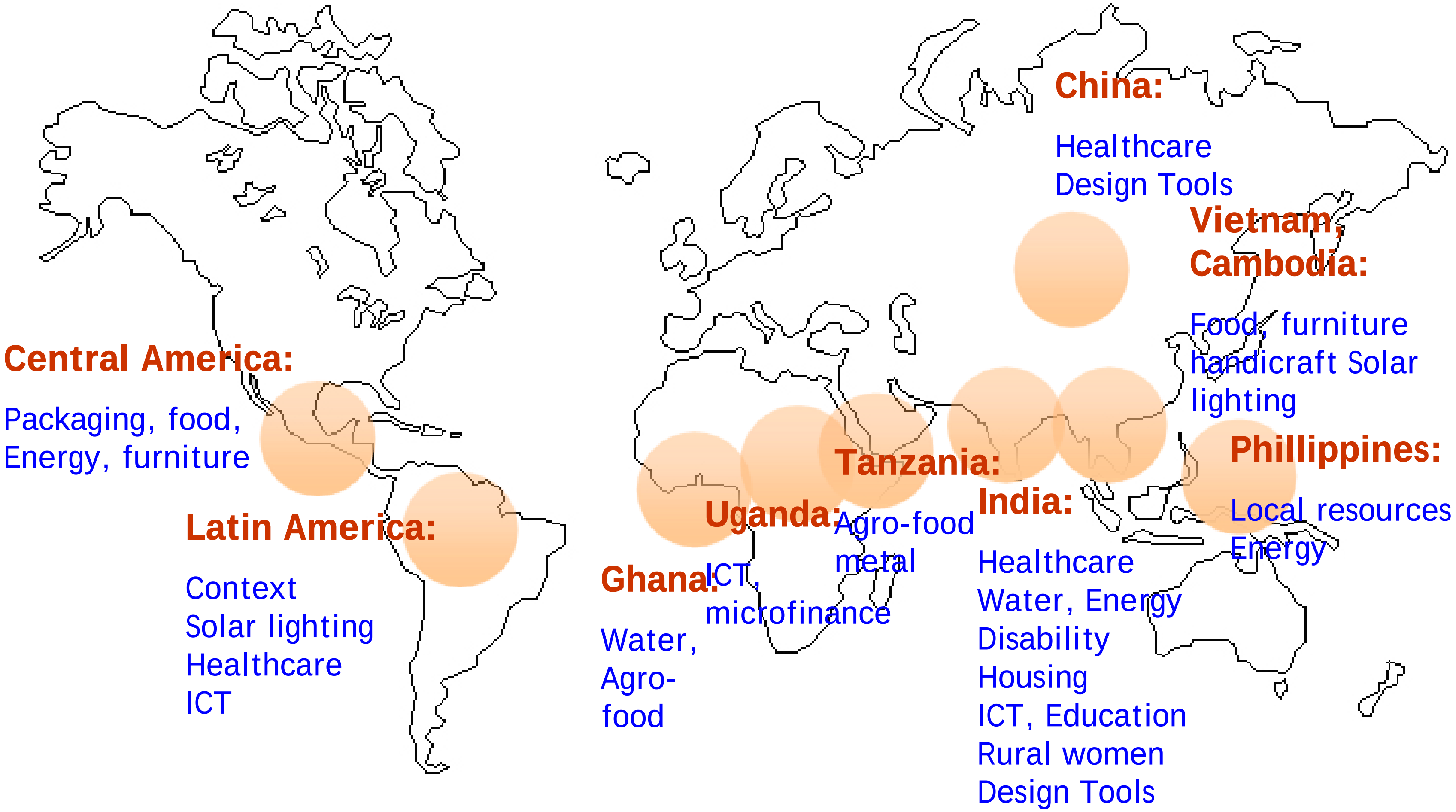
Projects Delft D4S outside Europe, 2000-2010



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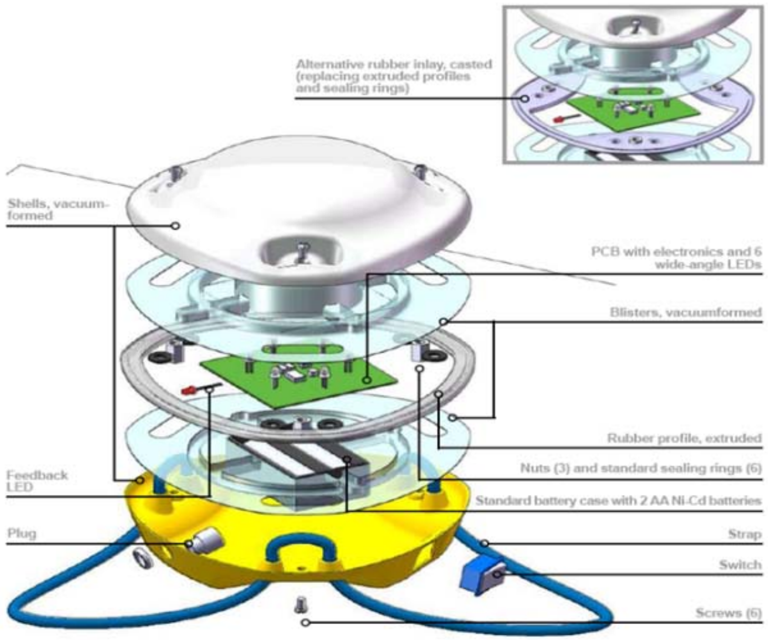

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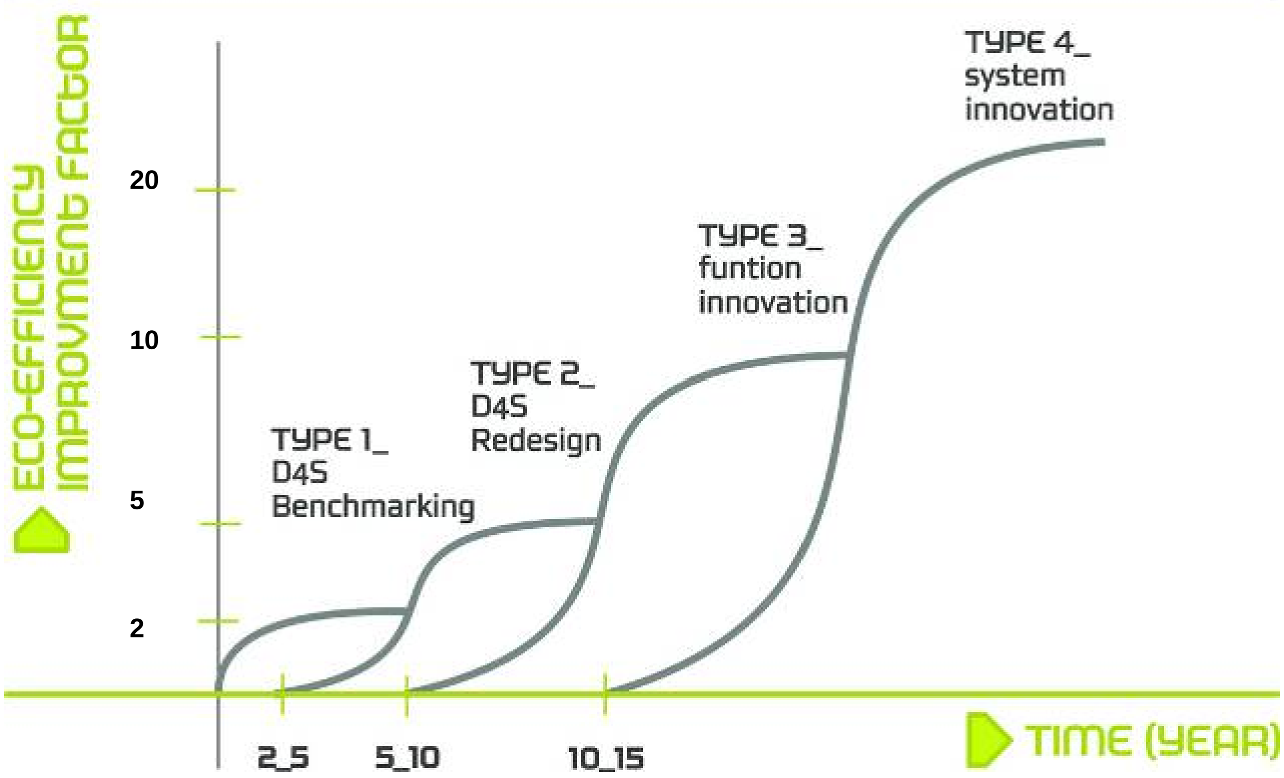
D4S: A Practical Approach

How much do we need to improve?

- 11 billion people in 2050
- 2 times as rich, use much more products
- Reduce global environmental impact:
- Factor 20 reduction of env. impact per product necessary



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UNEP D4S Guide (www.d4s-de.org)

Moving beyond D4S redesign

- *Radical Product Innovation*
- *Product-Service systems*
- *System innovation*
- UNEP resource book + site Nov 2009

  www.d4s-sbs.org

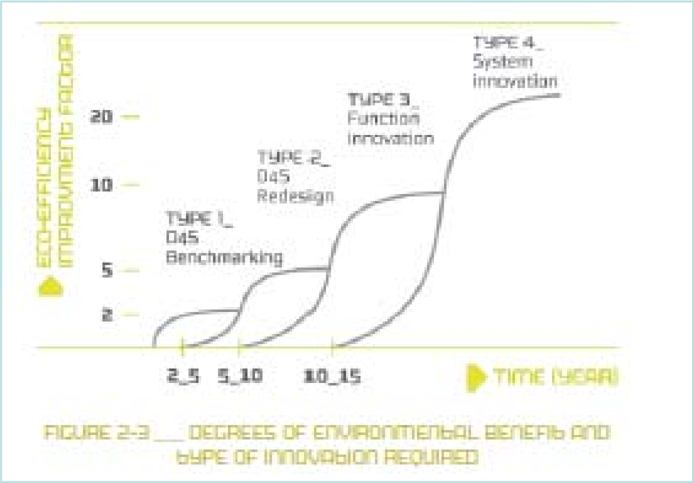

FIGURE 2-3 __ DEGREES OF ENVIRONMENTAL BENEFIT AND TYPE OF INNOVATION REQUIRED

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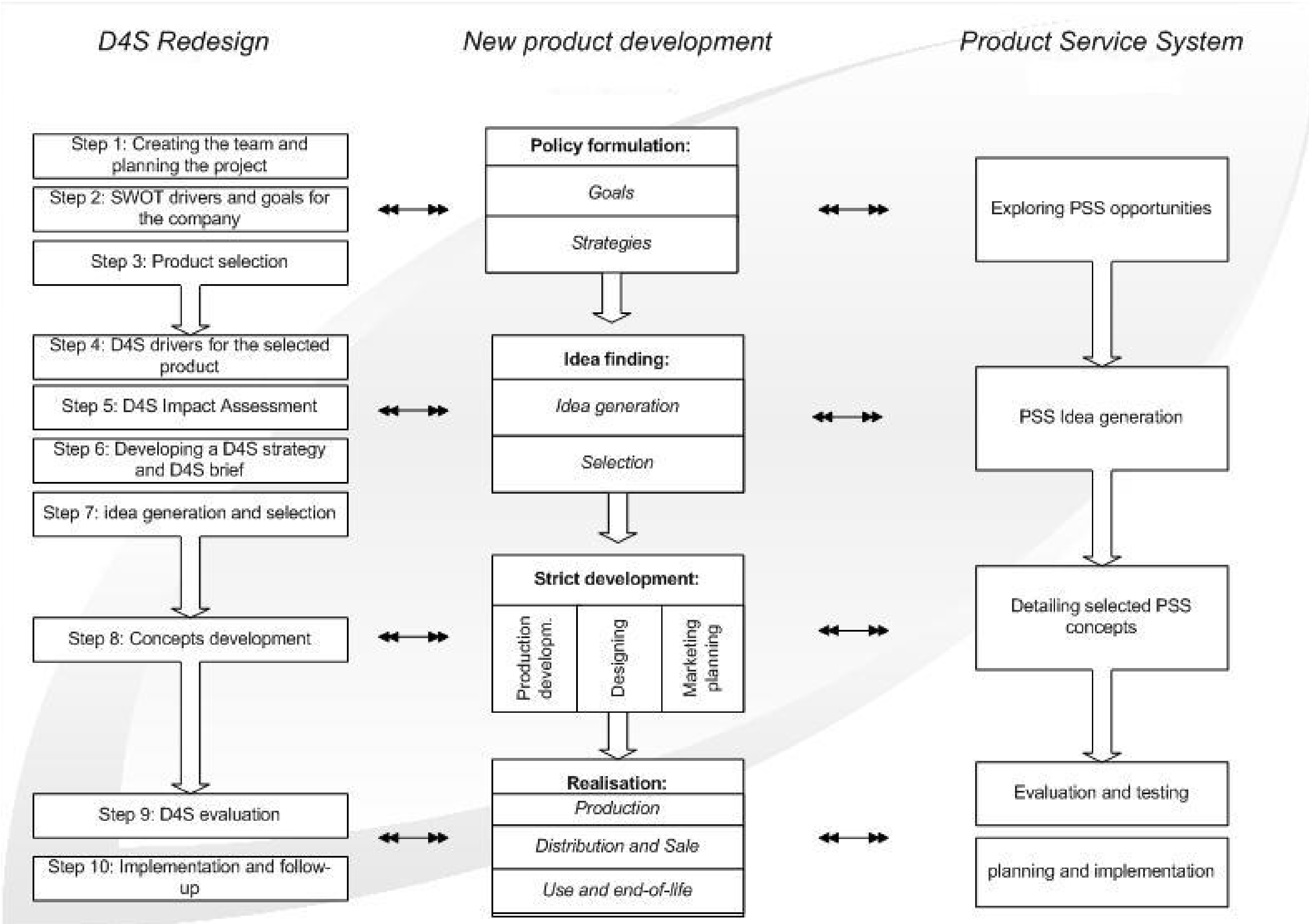
Three parallel D4S approaches



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D4S Strategies: furniture examples

low impact materials (1)

less materials (2)

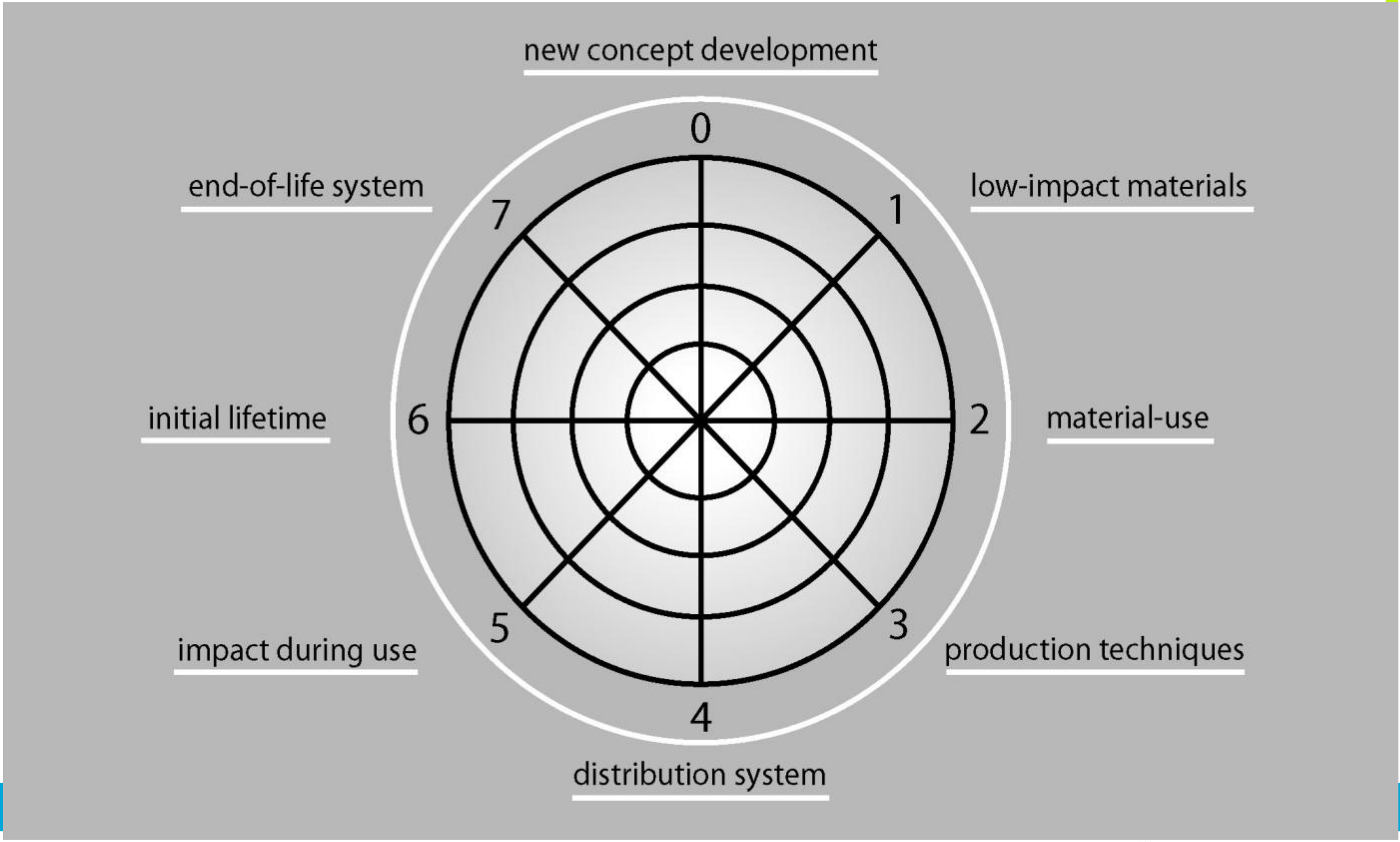
efficient distribution (4)

long initial lifetime (6)

design for end-of-life (7)

double function (@)

D4S Redesign Principles



Vietnam: BBQ Bar – Truong Thanh

- before

- after

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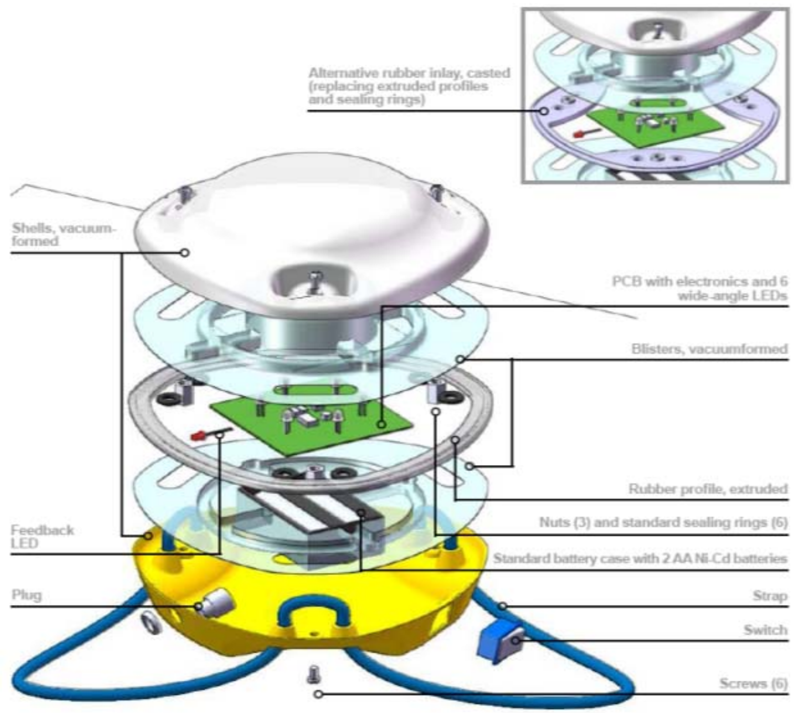
LED light for rural Cambodia: Moonlight (Ampoul Preahchan in Khmer)

Khmer

- Features (see prototype)
  - 6 wide angle LEDs, 40 lumen outcome
  - Equivalent of 3-4 kerosene lamps
  - Solar powered by 0.5 Wp solar panel
  - Which can be fixed to bamboo pole 'anti theft'
  - 2,5 hours of full lighting, 4 hours dimmed
  - Feedback light for charging



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Features 1: Final optimized design

- Features
  - Affordable lighting €18 (incl. PV panel)
  - Robust design (blister electronics)
  - Enough light (2 modes)
  - Safe
  - No running costs
  - Appealing design

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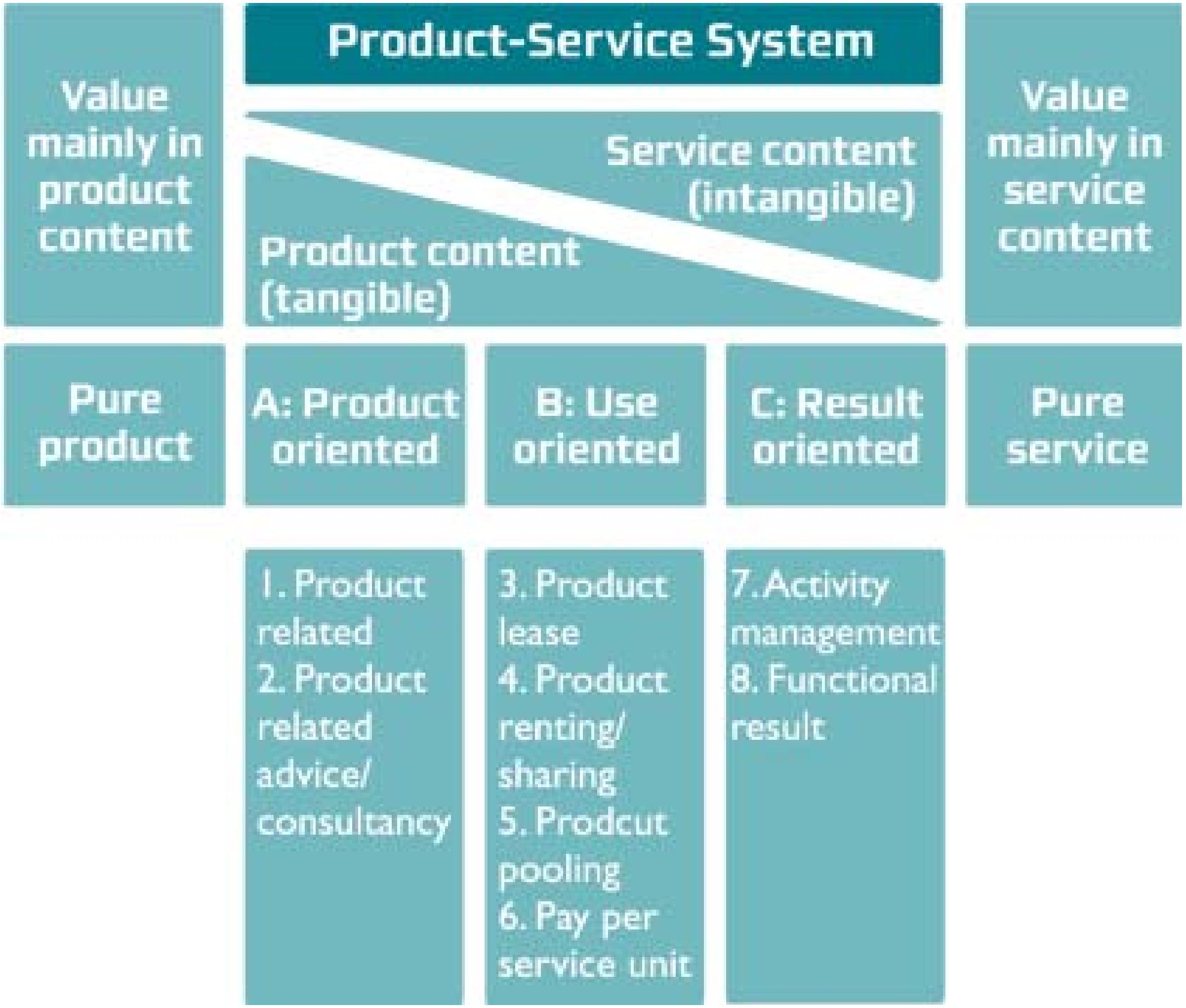
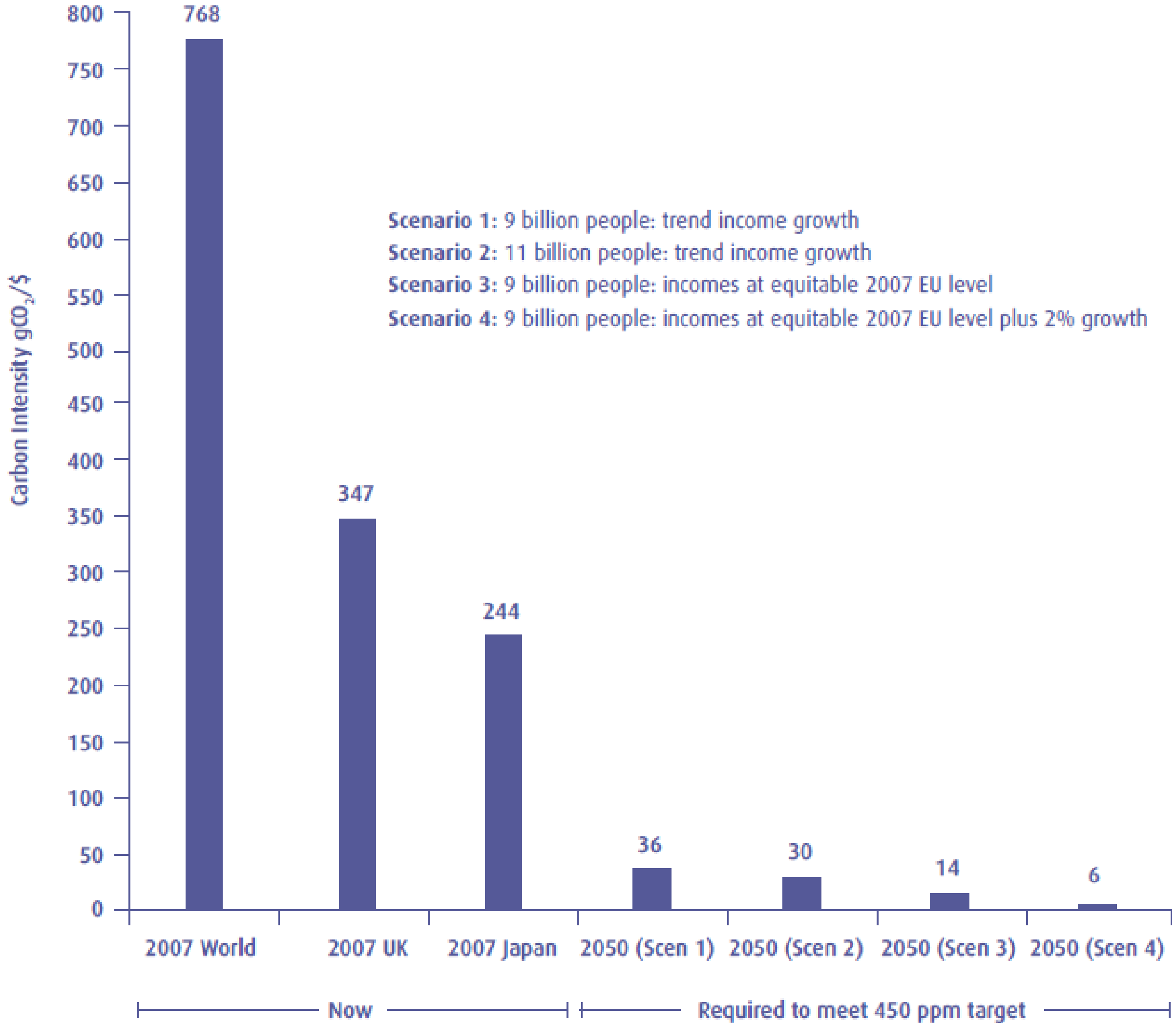
Sustainable Product Service systems



The Myth of Decoupling (Jackson 2009)

Figure 17 **Carbon Intensities Now and Required to Meet 450 ppm Target**[25]



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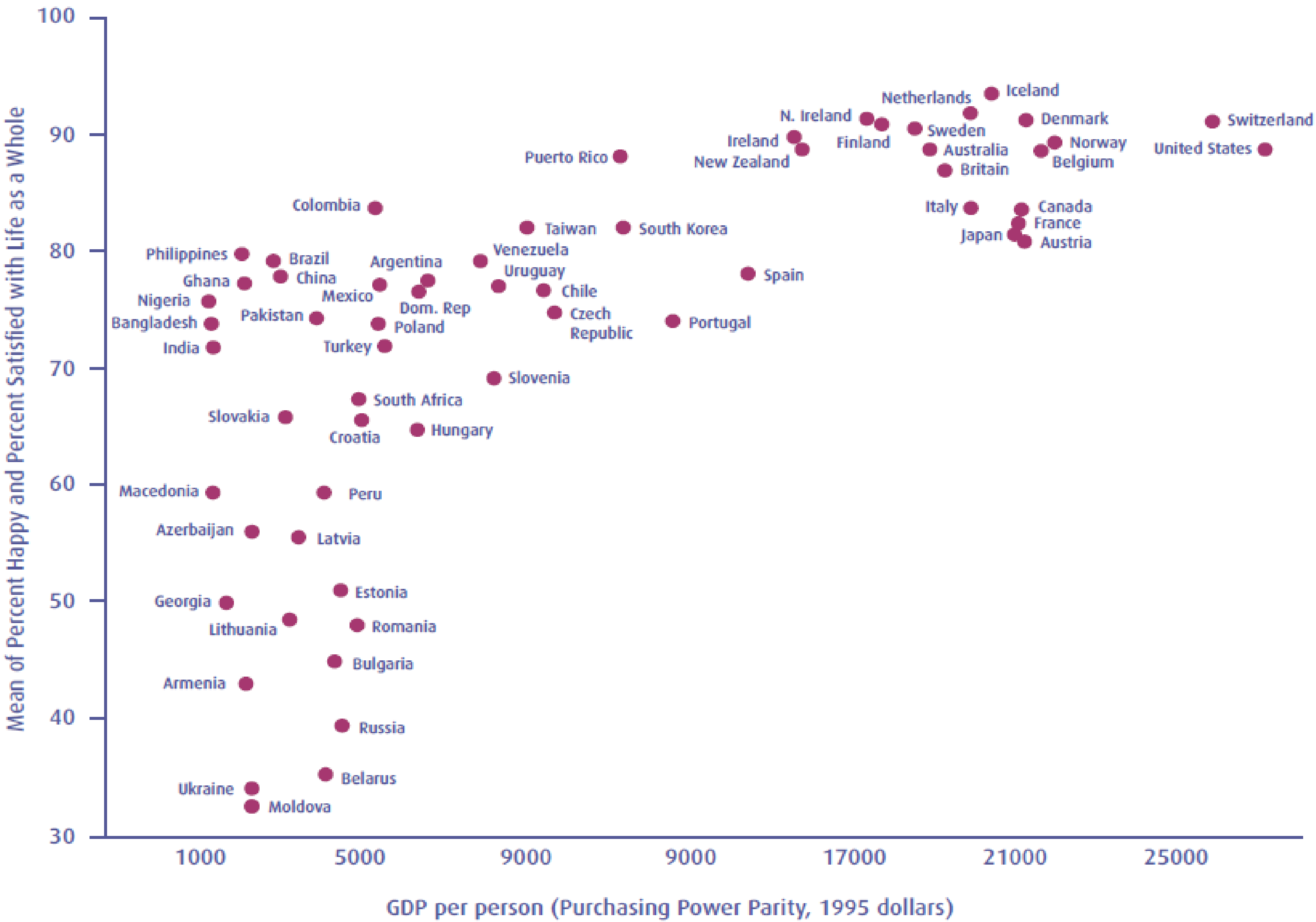
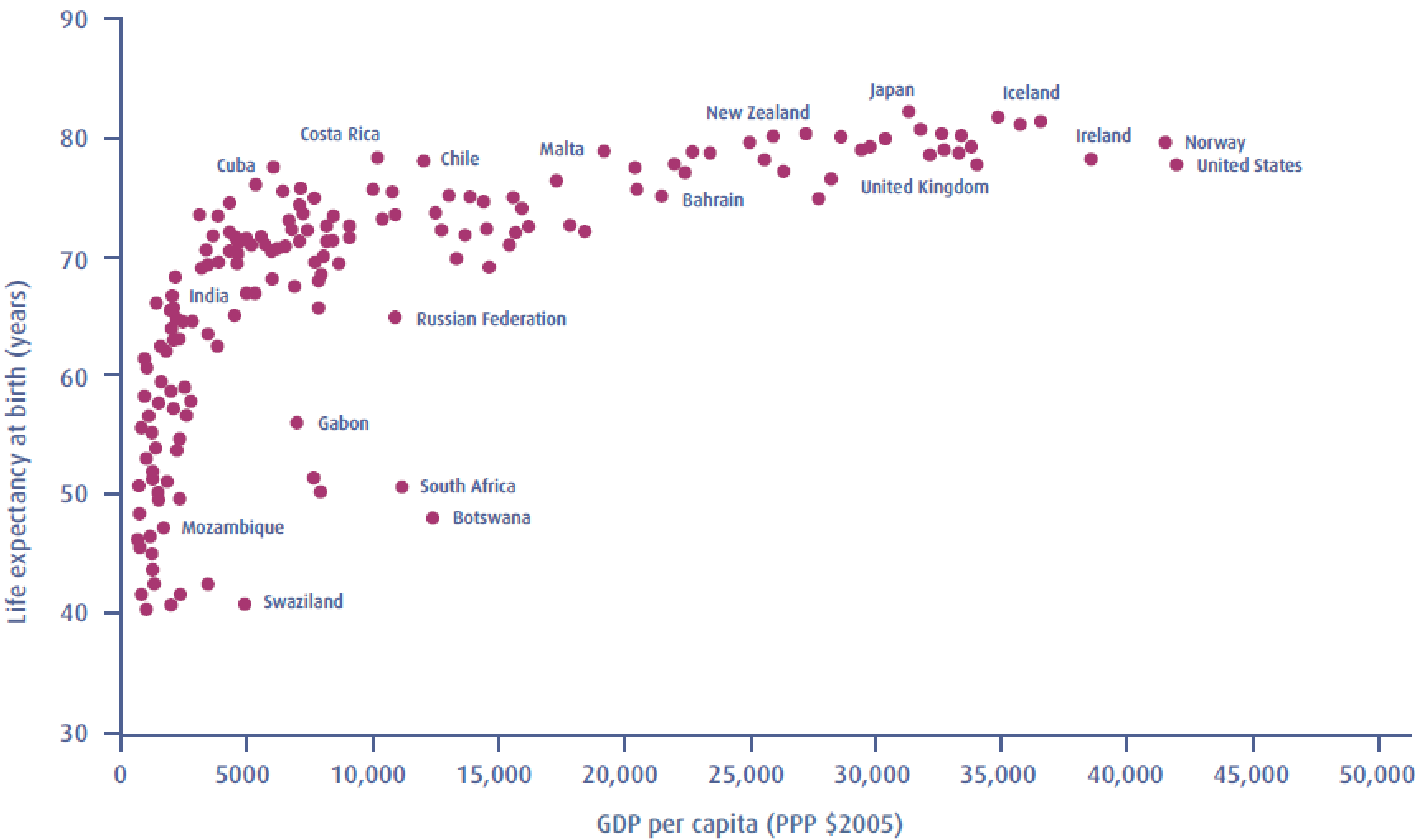
Rich enough?

Figure 6 **Happiness and average annual income**[15]



Healthy enough ?

Figure 8 **Life expectancy at birth vs average annual income**[16]



Extension of D4S:

- D4S strategies
- Flourishing
- Resilience & Distributed Economy
- User oriented Best Product-Services

Flexible Approach

- Ahead of policies
- Creating future possibilities
- No: transition studies
- Cooperation with UN, Philips, Vitens, Energy Valley, Ikea, Vodafone
- Design Factories Lund, Helsinki
- 5 EU programs - LivingGreen, Ecomind, C2C Islands, SWITCH Asia, UNCHAIN
- Also: Delft Inn. Lab

Ideal D4S project

- 80% standard solutions
- 20% best practices

And…

- 1 % radical innovation

Thank you!

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