Sustainability Scenario's: Priority Areas and Strategies for Decoupling

Lessons from SCORE, EIPRO and SusProNet

23-24 October 2006
Forescene Workshop
Vienna, Austria

Arnold Tukker

TNO

Project Manager EIPRO

Structure of the presentation

- 10 minutes -> Short!
- Focus -> question marks!
  - Forescene deals with sustainability visions, essential elements in scenario's, and key possible policy instruments
  - …a quite formidable package calling for the 'solution of everything'….
  - Where EIPRO, my basis, is a priority setting study
- I will hence use EIPRO, SCORE and other work to deal with the following questions
  - Sustainability – what is it?
  - Priorities – where to start?
  - Decoupling strategies – which ones help most?

Sustainability – what is it (SCORE) ?

- A small reminder
  - A highly subjective notion, truly paradigmatic
  - Frames range from
    - 'individualist' sustainability through the market, just asking for basic social and environmental boundary conditions based on 'sound science'
    - to 'egalitarian' democratisation of technologies and 'small is beautifil' societies formed by creative communities, based on a high level of equity in income and precautionary approaches
  - Three 'common' issues we focus on in SCORE!
- Issue 1: (Environmental) Factor X resource productivity improvement
  - Ehrlich and Holdrens I = P x A x T
  - With P from 6 to 9 billion and Affluence rising sharply in Asia, T must become a factor 4-10 lower
 - This is in fact a radical agenda

Sustainability – what is it

- Issue 2: (Social) Ending grinding poverty
  - Not acceptable to our standards of justice and ethics
  - SCP is, however, not the primary agenda driving this
  - It hence must be supportive
    - Ensuring that supply chains comply with basic social and environmental standards
    - Fair payment

- Issue 3: (Economic?) a fascination
  - Societies perform markedly different in providing long, happy lives with a given ecological footprint
  - Money hence does not seem to make happier – above a threshold
  - This may give clues how organisation of society may contribute to quality of life
   - (…and hence again may result in suggestions like the 'slow' paradigm…)

Issue 3: The 'happy planet index'


•Source: HPI report, New Economics Foundation, UK
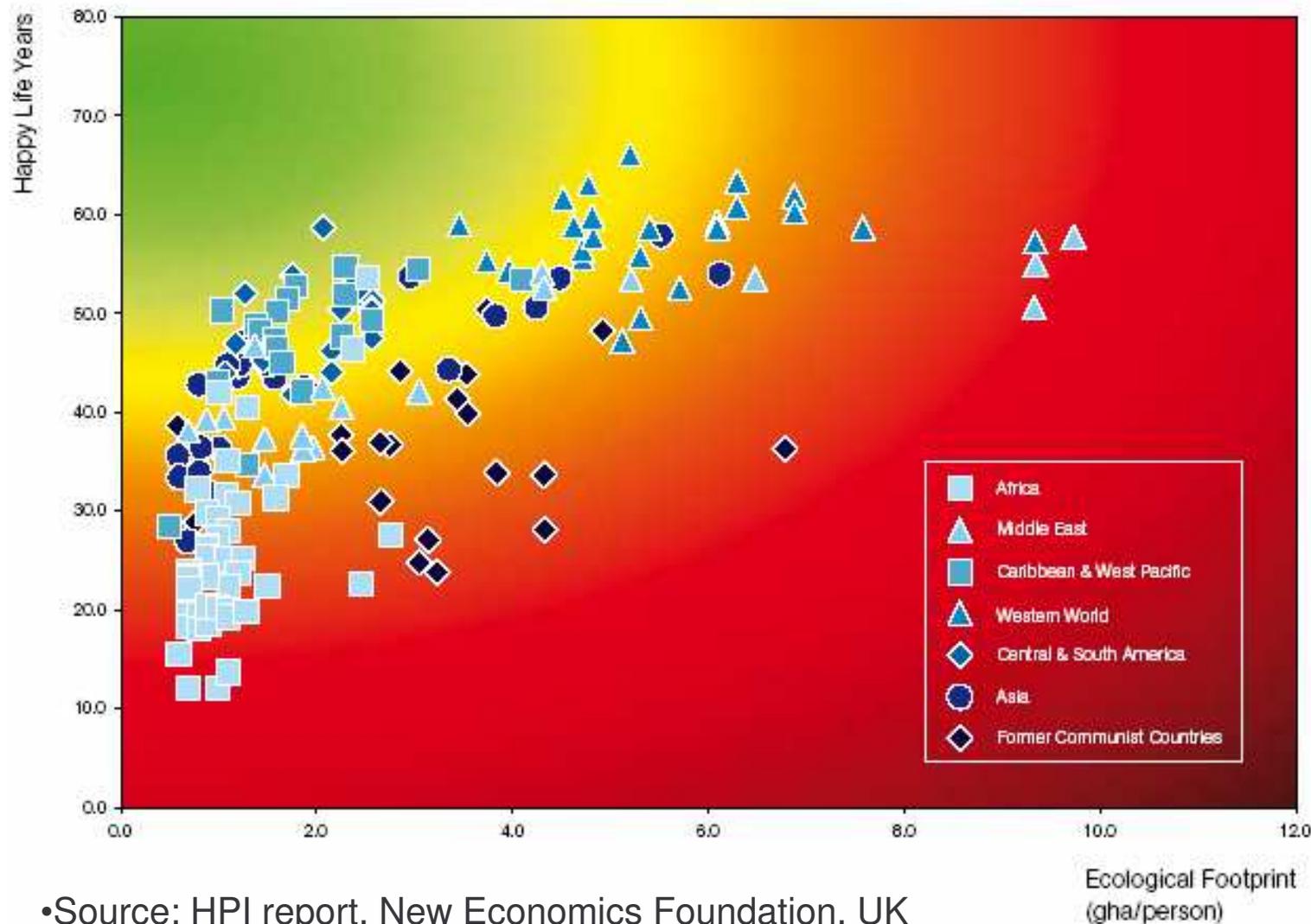
Priorities – where to start (EIPRO)?

- EU study 'Environmental Impacts of Products'
  - Track 1: Review 7 existing (national studies
  - Track 2: Use CML CEDA EE I-O model; adapt that to the EU -> 500x500 matrix and 280 final consumption items
  - Published by IPTS and in JIE 10:3
- Conclusions:
  - Hot spots: Food (meat and dairy), Mobility (car and air transport), Housing/Energy use >70% of life cycle impact at 50% expenditure
  - Difference in impact per Euro is limited (factor 4-5)
  - 80-20 rule applies: you can focus IPP on 20-30 categories
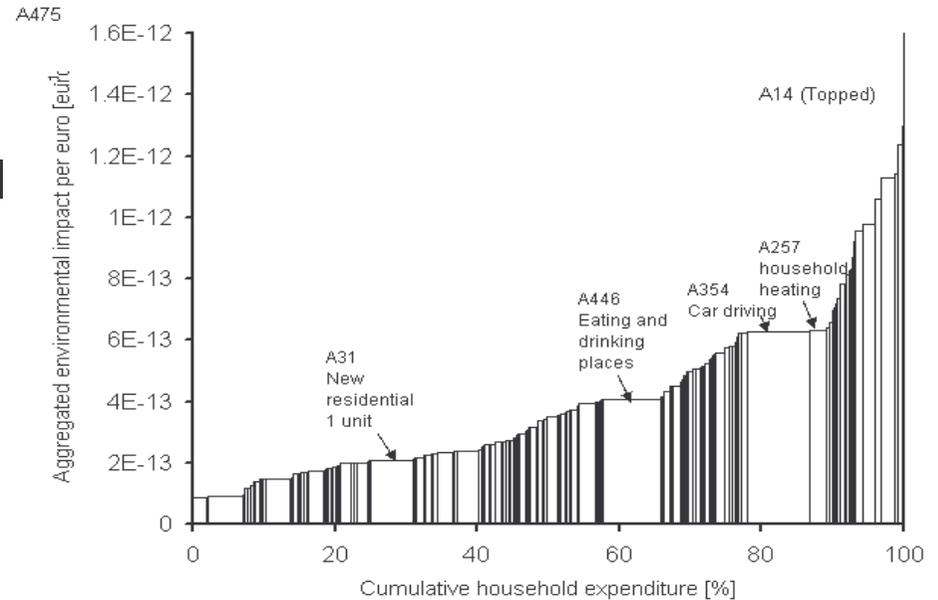
global warming
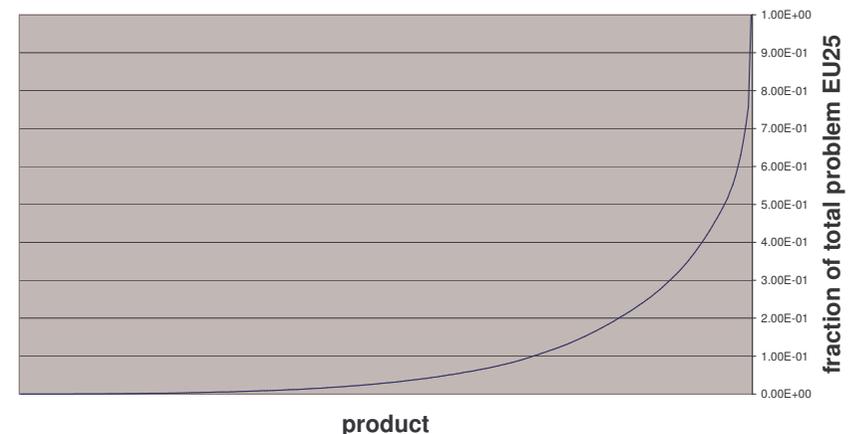
Decoupling strategies – where to start ?

- Approaches to decoupling
  - Production side
    - Improving emission factors / end of pipe
    - Improved technology / radical technical change
  - Consumption side
    - More intensive use of products and materials (sharing, pooling)
    - Shifting expenditure to immaterial value
    - Improving the 'happiness per Euro/$ spent'
- Improving emission factors
  - Successful for small mass flows
  - Factor 5-10 can be achieved
    - E.g. emission targets for SOx in many EU countries
    - Reduction of CO, NOx, and VOC emissions from cars with a factor of 5 between 1990-2020 despite 50% more kilometers
- Improved technology
  - Incremental: several dozen %
  - Radical: factor 5+, such as:
    - Hydrogen cars
    - Alternative energy sources
    - Etc.

Decoupling strategies (consumption side)

- More intensive use of products
  - Renting, sharing, pooling
  - Multi-functional use
  - Typical gains: factor 2
- Shifting to less material intensive consumption
  - Often mentioned ('services', 'quality', 'immaterial value')
  - But less potential than often thought
    - Impact per Euro/$ between the worst and best product is a factor 4-6
    - Not all shifts are possible ('mankind cannot stop eating'
  - Factor 2-3 may be possible
- Improving 'happiness/quality of life per Euro/$ spent'
  - New kid on the block, but relevant
  - Consumer economies do not improve QoL anymore

Decoupling strategies, consumption side (ctd).

- **'Immaterial consumption'**
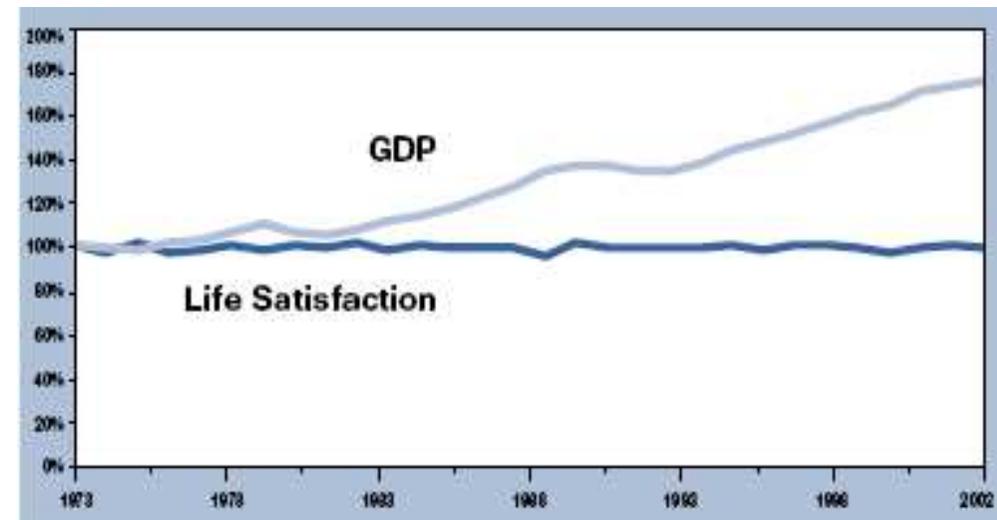 - Figure gives impact/Euro for total EU expenditure in 280 categories
  - Difference high/low is factor 4-6
  - Top categories are food products

Source: EIPRO, EU DG JRC-IPTS, Summer 2005
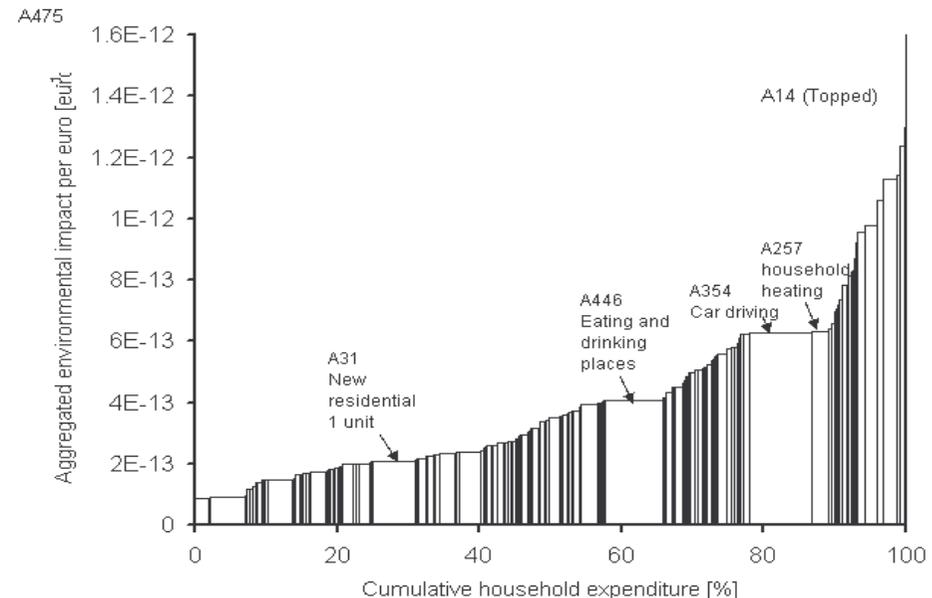
- **'Quality of life / Euro'**
  - UK: GDP rose factor 2 in 30 years
  - Life satisfaction not
  - Similar figures for Japan and other countries

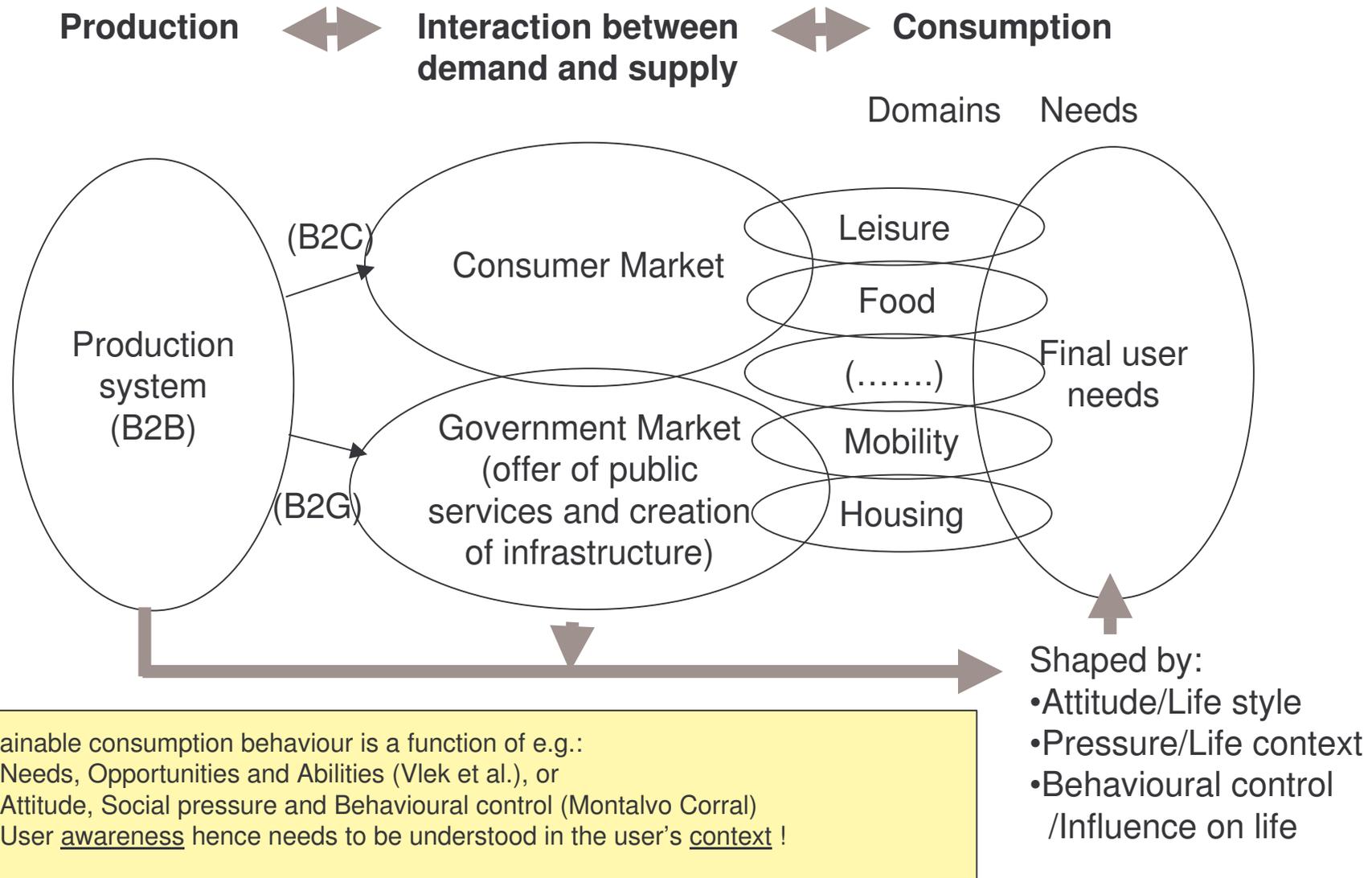Source: New Economics Foundation: A well-being manifesto (2004)

Conclusions

- Sustainability is a paradigmatic notion
- Focus on food, mobility and energy/housing
- Factor X potential is there…..if consumption is addressed as well (but do it smartly!)
  - No 'limits to growth' or 'restricting consumption', but
  - Organising patterns of consumption so that maximum quality of life is realised while using the same resources
  - …which is a question of macro-economic efficiency

Intervention mechanism	Potential reductions of impact per unit Quality of Life
Reducing emission factors	- Small mass flows: several factors - Large mass flows: Limited
Improving production	- Usually limited to intermediate, - Factor X in case of system innovation
Enhancing use intensity	- Factor 2 or more, depending on the sharing, pooling or function combination system
Enhancing immaterial consumption	- Factor 2 (if limited to changes within existing product and service categories)
Enhancing the ratio Quality of life and consumer expenditure	- Several factors?

Sustainable Consumption Systems

Production ⬌ **Interaction between demand and supply** ⬌ **Consumption**

Domains   Needs

Production system (B2B)

(B2C) → Consumer Market

(B2G) → Government Market (offer of public services and creation of infrastructure)

Leisure
Food
(.......)
Mobility
Housing

Final user needs

Shaped by:
- Attitude/Life style
- Pressure/Life context
- Behavioural control /Influence on life

Sustainable consumption behaviour is a function of e.g.:
a) Needs, Opportunities and Abilities (Vlek et al.), or
b) Attitude, Social pressure and Behavioural control (Montalvo Corral)
- User awareness hence needs to be understood in the user's context !
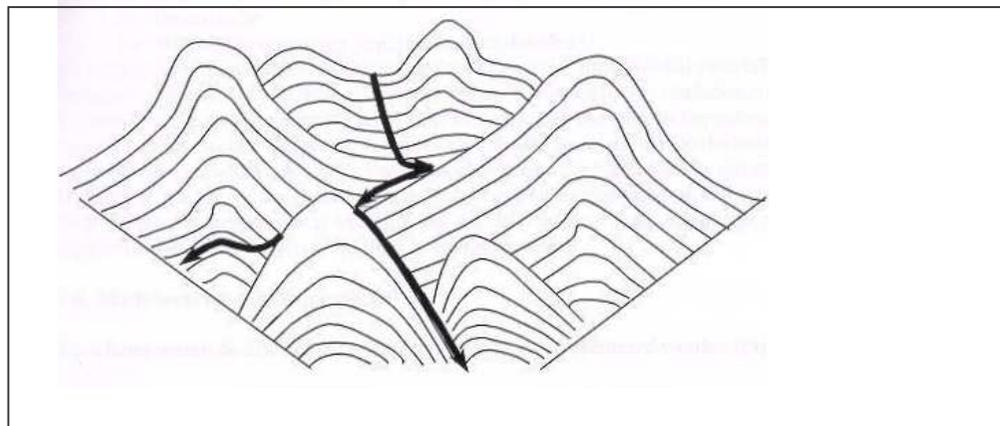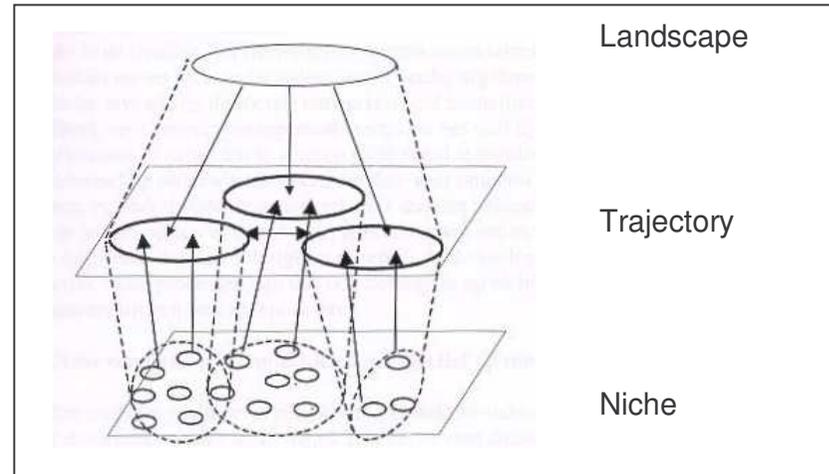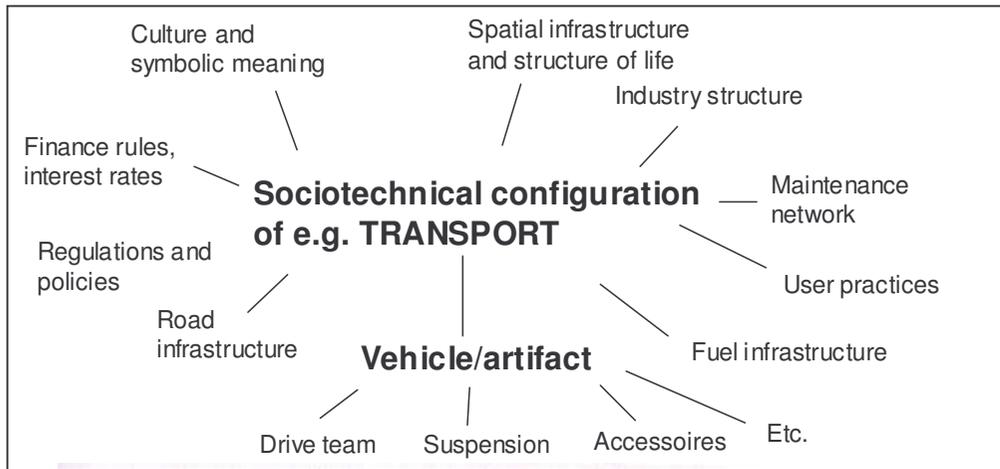
Adapted from: project Life Cycle Approaches to Sustainable Consumption, AIST, Japan **WITH THANKS !**

Governance towards SCP

Culture and symbolic meaning

Spatial infrastructure and structure of life

Industry structure

Finance rules, interest rates

Sociotechnical configuration of e.g. TRANSPORT

Maintenance network

Regulations and policies

Road infrastructure

Vehicle/artifact

User practices

Fuel infrastructure

Drive team   Suspension   Accessoires   Etc.

Landscape

Trajectory

Niche

•Stabilisation

•Accelleration

•Predevel-opment   •Take-off

•Time

- •Systems are more than actors, material flows, emissions or $ flows
    - •Landscape channels direction: infrastructure, geopolitical realities, dominant cultures
    - •'System memory' or regime as well: institutions, agreements, habits, interests
- •The landscape channels the development trajectory of the system
- •Radical things start in niches
- •Transitions show an S-curve and need novel governance (no means-end approach)

Governance to SCP: levels and problems

A system is the the combination of:	Context and framework conditions		
	Production structure ⟷	**Interaction between demand and supply** ⟷	**Consumption structure**
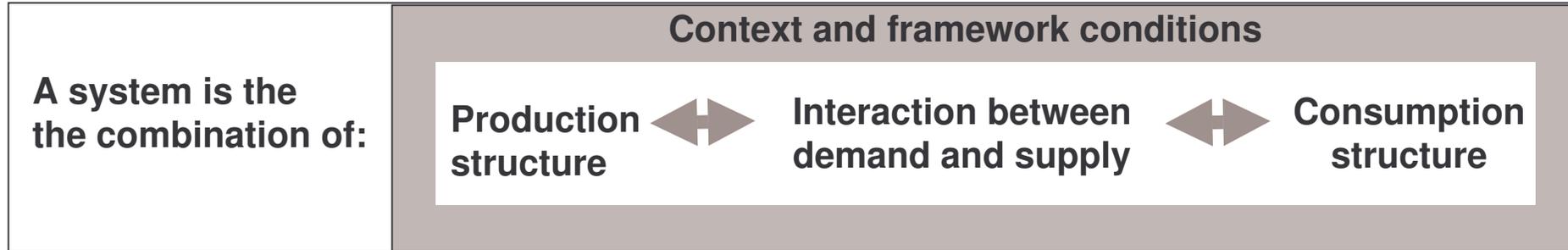
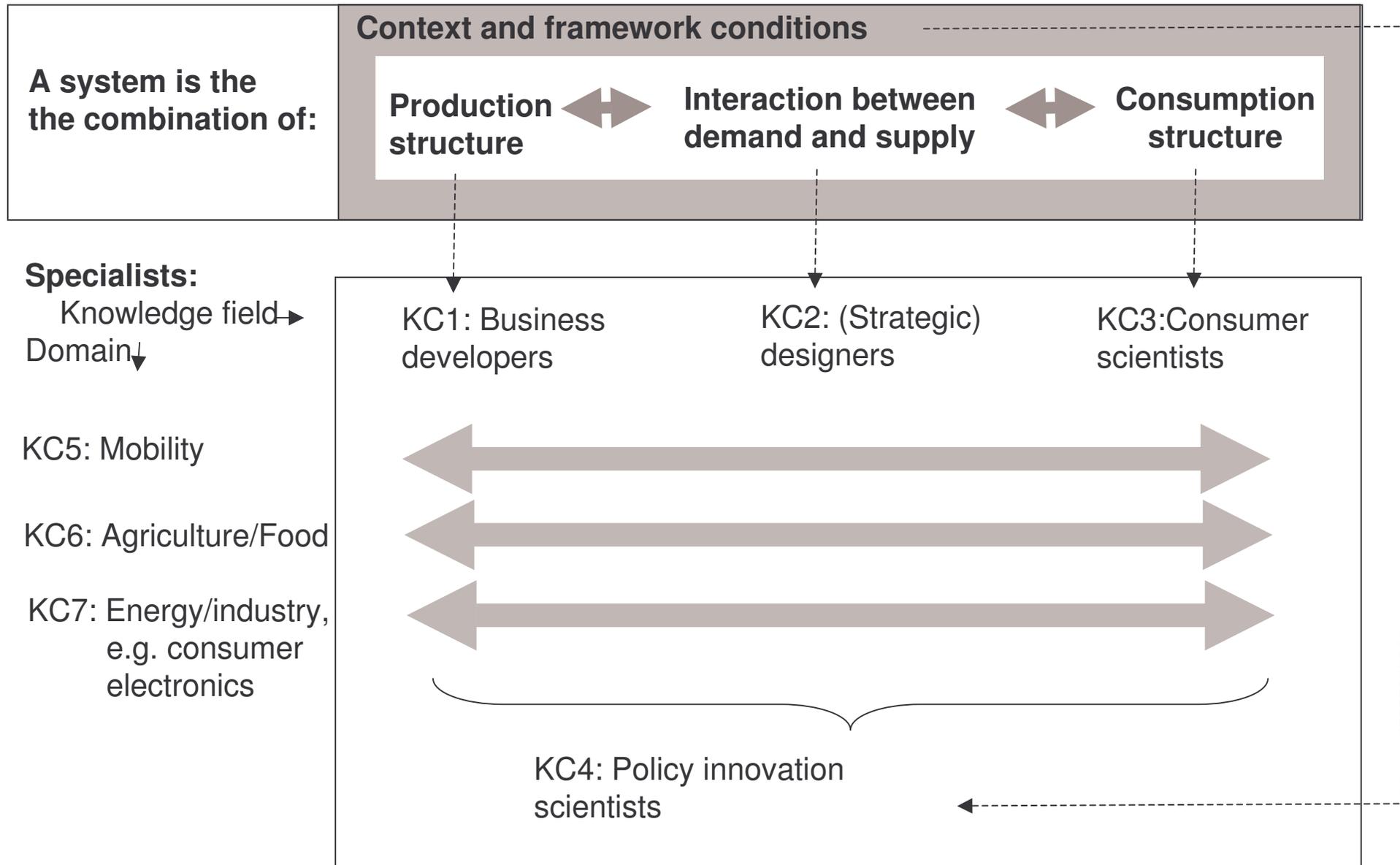| What	Approaches
1. Optimise systems	Awareness raising
2. Redesign systems	Awareness raising + offer of sustainable solutions
3. Innovate systems	Awareness raising + offer of sustainable solutions+ adapting context and framework

1. Car energy label *(marginal improvement)*

2. Car sharing system *(Factor 2)*

3. Low transport-need environment (Floridosdorf, Vienna) *(Factor X)*

Arnold.tukker@tno.nl

Knowledge communities to be involved

Context and framework conditions

A system is the the combination of:

| **Production structure** | ⬌ | **Interaction between demand and supply** | ⬌ | **Consumption structure** |

Specialists:

Knowledge field →
Domain ↓

KC1: Business developers

KC2: (Strategic) designers

KC3: Consumer scientists

KC5: Mobility

KC6: Agriculture/Food

KC7: Energy/industry, e.g. consumer electronics

KC4: Policy innovation scientists

Structure of Activities

From end 2005
Exploring and exchanging concepts

2006-end 2007
'Empirical validation' of concepts with Best Practice in three real-life B2C chains

Until mid 2008
Consolidation of concepts and community

- Milestones (Month)

| M2 | M8 | M24 | M30 |

- Organisation ready
- Concepts explored
- Validation ready
- End

- Management (WP16), Communication/dissemation (WP17), Permanent Network building (WP18)

- WP8 Integration
- WP8 Integration

- WP1/KC 1
- WP1/KC 1

- WP2/KC 2
- WP2/KC 2

- WP3/KC 3
- WP3/KC 3

- WP4/KC 4
- WP4/KC 4

- WP5/KC 5 (Mobility)

- WP6/KC 6 (Agro-food)

- WP7/KC 7 (Energy&electronics)

- WS1 (WP9)
- CO1 (WP10)
- WS2 (WP11)
- WS3 (WP13)
- CO3 (WP15)

Focus per Event

Workshop 1	**General platform for exchange of views how to realise sustainable consumption structures between the 33 Participants and Partners, from their own knowledge background.**
Conference 1	**Goals:** **•Launch the network in the EU arena** **•Provide a broad platform for conceptual exchange** **•Provide a broad platform for SC case presentation s**
Workshop 2	**WS2-3 are organised giving <u>consumption domains</u> centre stage. WS2 starts with discussing 5-10 SCP cases per domain from the 4 knowledge perspectives, analysing success- and failure factures, re-design potential, and danger of rebound effects**
Workshop 3	**WS3 abstracts the lessons of WS2 to a higher level, leading to concepts models and case typologies of successful implementation approaches for sustainable consumption in relation to user awareness**
Conference 2	**Conference 2 validates the results of the project and forms a first outreach to policy, industry, certification organisations and other bodies relevant for implementation**