



Sustainable Development

More about competence than values

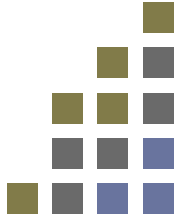
Prof Karl-Henrik Robért

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+46 455 38 50 00
www.bth.se/eng



Åbo, 14 December 2009

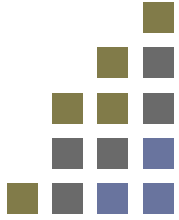




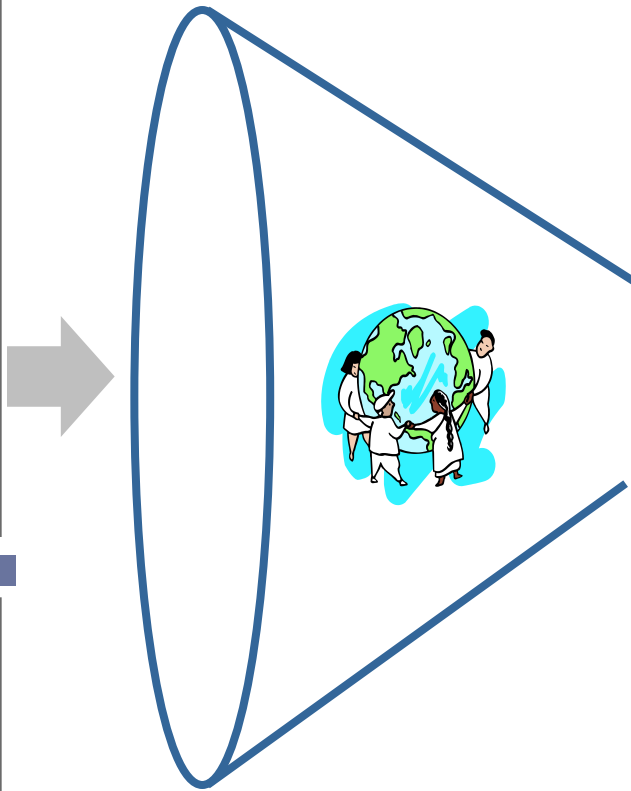
Systems thinking

- ♦ Individuals
- ♦ Groups





S.D profitable also in loneliness



Threats

- ♦ Forests
- ♦ Agriculture
- ♦ Fisheries
- ♦ Ground water
- ♦ Climate
- ♦ Metals
- ♦ Chemicals
- ♦ Global justice
- ♦ Trust
- ♦ Stories of meaning

Opportunities

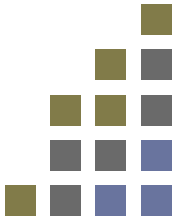
- ♦ Resource costs
- ♦ Waste management
- ♦ Tax, legislation, insurance, loans
- ♦ International agreements
- ♦ New markets
- ♦ Innovation/design/new markets
- ♦ Trust
- ♦ Talent wars
- ♦ Brand



So, what's the problem?

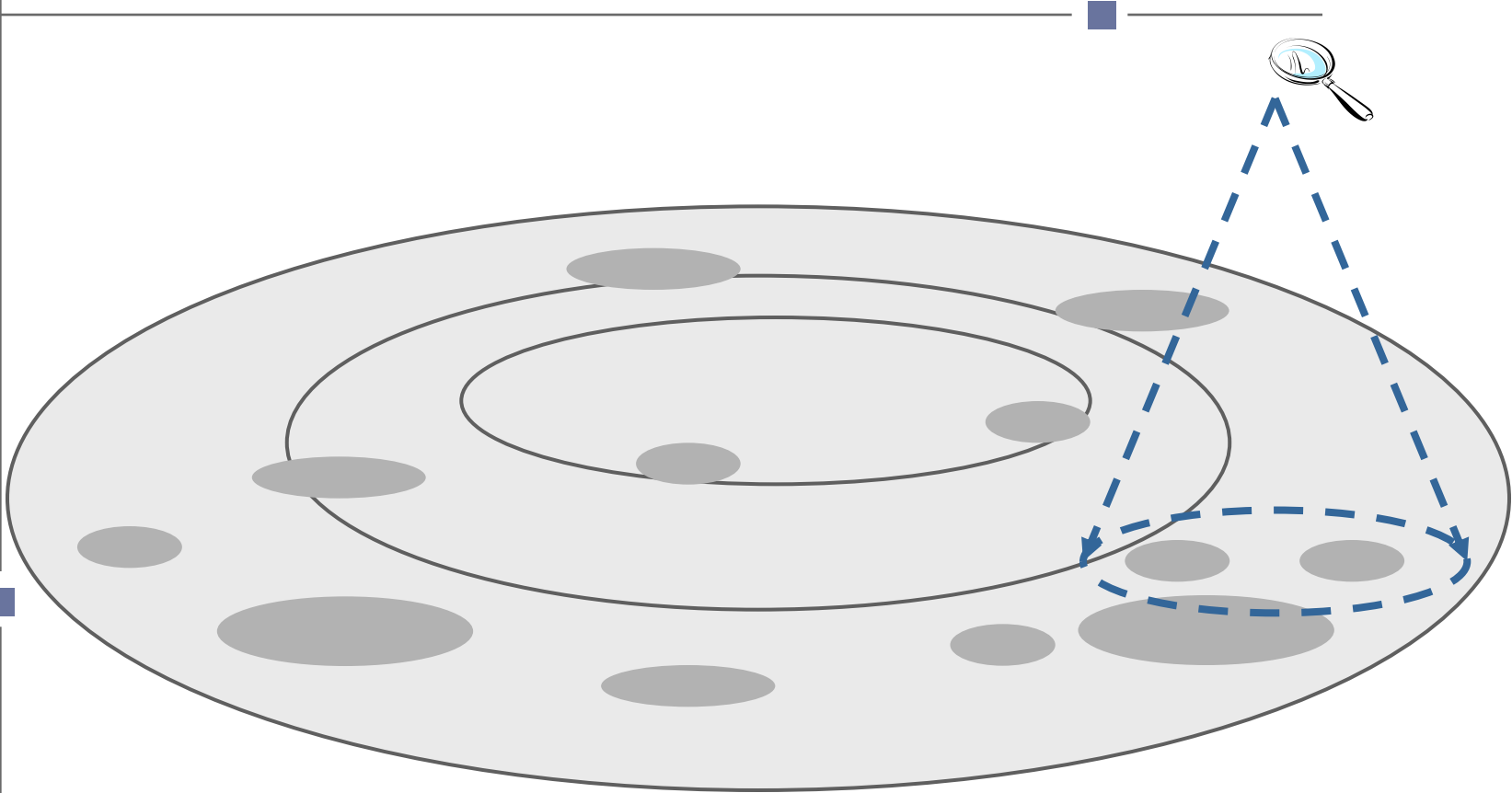
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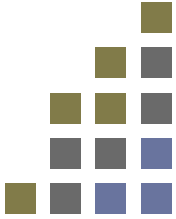
Reductionism



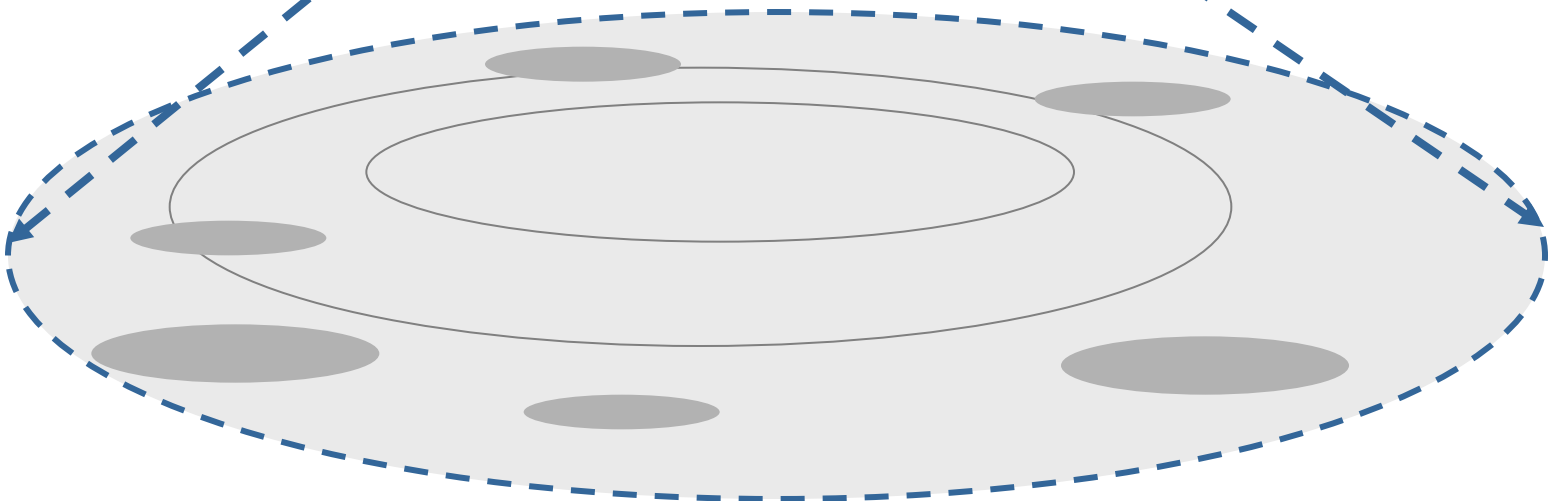


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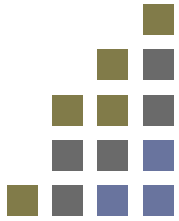


**Structured
overview**



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Backcasting!

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Sustainable vision



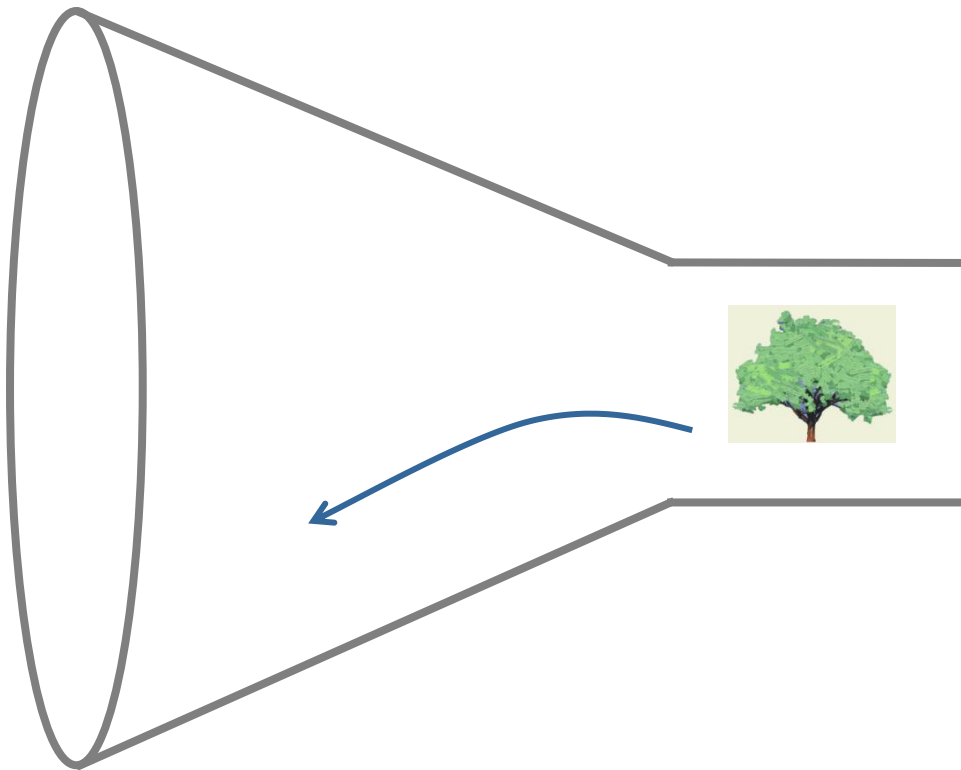


Robust sustainability principles *would* allow:

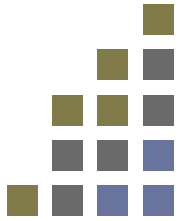
- Step-wise open ended "chess-like" approach
- Coordination of dep:ts, org's, sectors and stakeholders
- Calculations of resource potentials
- Dealing with multi-dimensional trade-offs
- "Purpose" to set system boundaries



Such principles must be...



- Necessary
- Enough
- General
- Concrete
- Distinct



SSD Framework

System



Success

Is key!



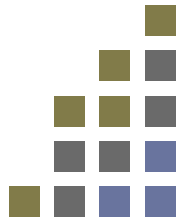
Strategy



Action



Tools



Level 1, the system

Sustainable energy potential, Thermodynamics, Linkage to material flows, biogeochemical cycles, interdependencies, resilience and adaptivity...





Level 2, basic sustainability principles

In the Sustainable Society, Nature is not subject to systematically increasing...

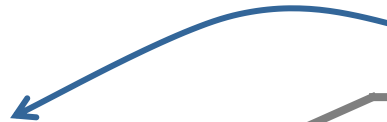
- 1 ...concentrations of substances from the Earth's crust.
- 2 ...concentrations of substances produced by society.
- 3 ...degradation by physical means.

and

- 4 ... people are not subject to conditions that systematically undermine their capacity to meet their needs.

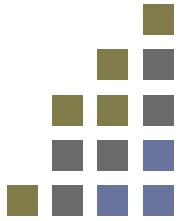


Sustainable Vision



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SSD Framework

System



Success



Strategy



Action



Tools



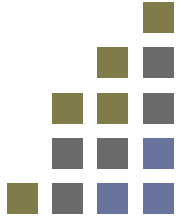
Each (large) investment:

- Direction right?
- Flexible platform to full success?
- Good return on investment?

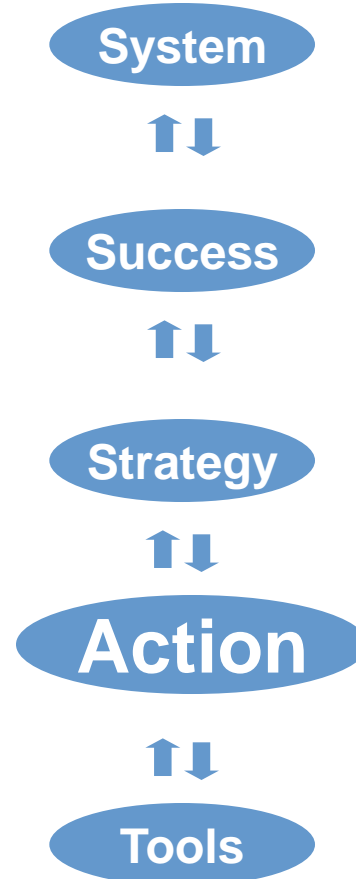


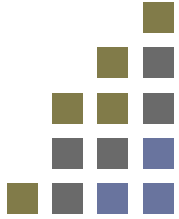
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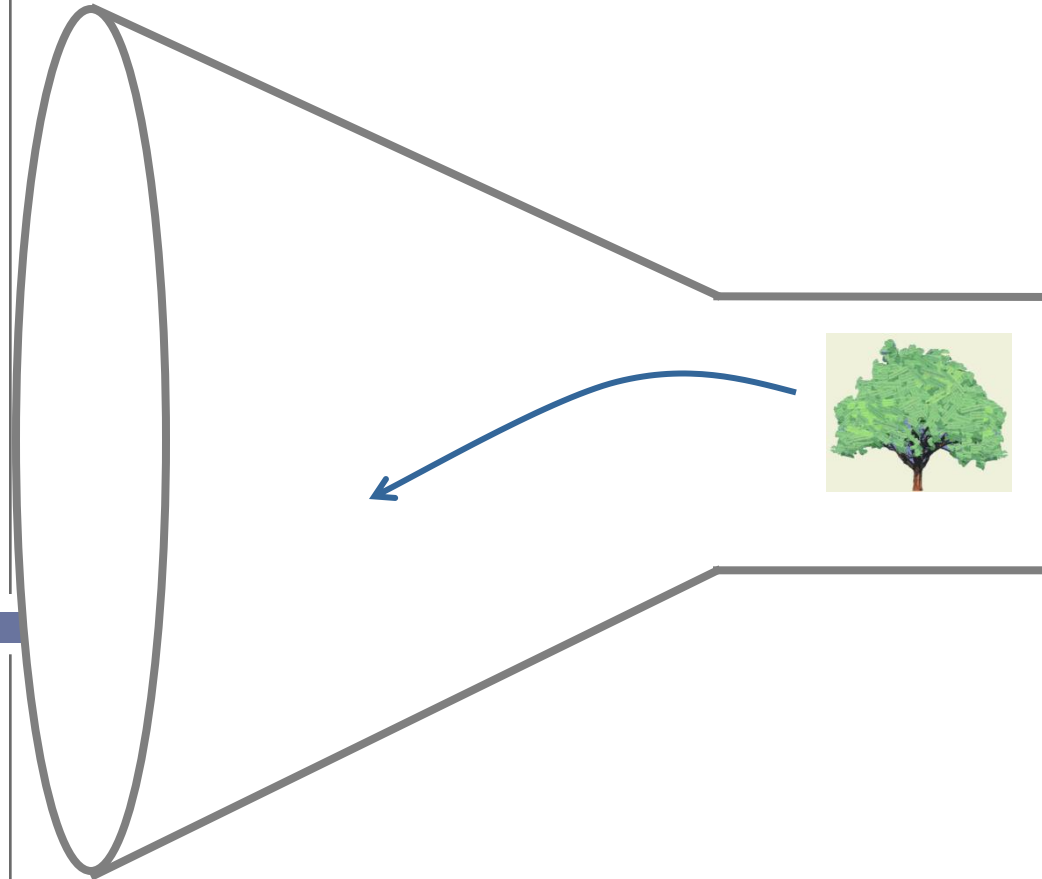


SSD Framework





Level 4, action for business



IKEA
Electrolux
Scandic Hilton
Sv. McDonalds
...



Spread to 11 countries...



Rio Tinto Alcan

Scandic



Canon



Interface

VOLVO
AERO



SHIFT the future

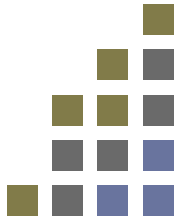
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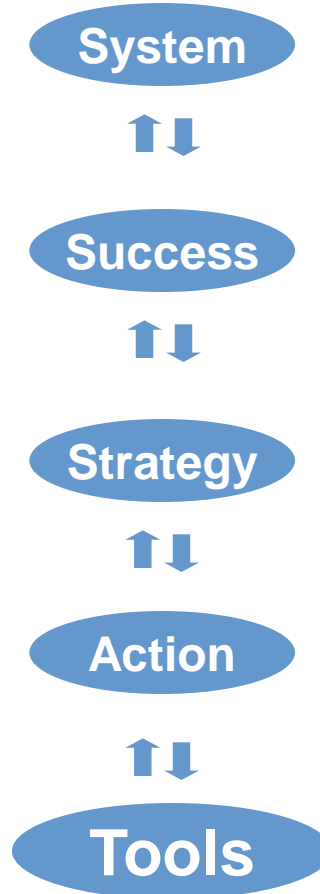
AURA
THE ORIGINAL LONG LIFE LIGHT

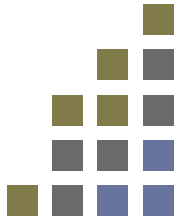


the NATURAL STEP



SSD Framework

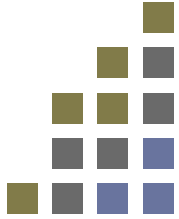




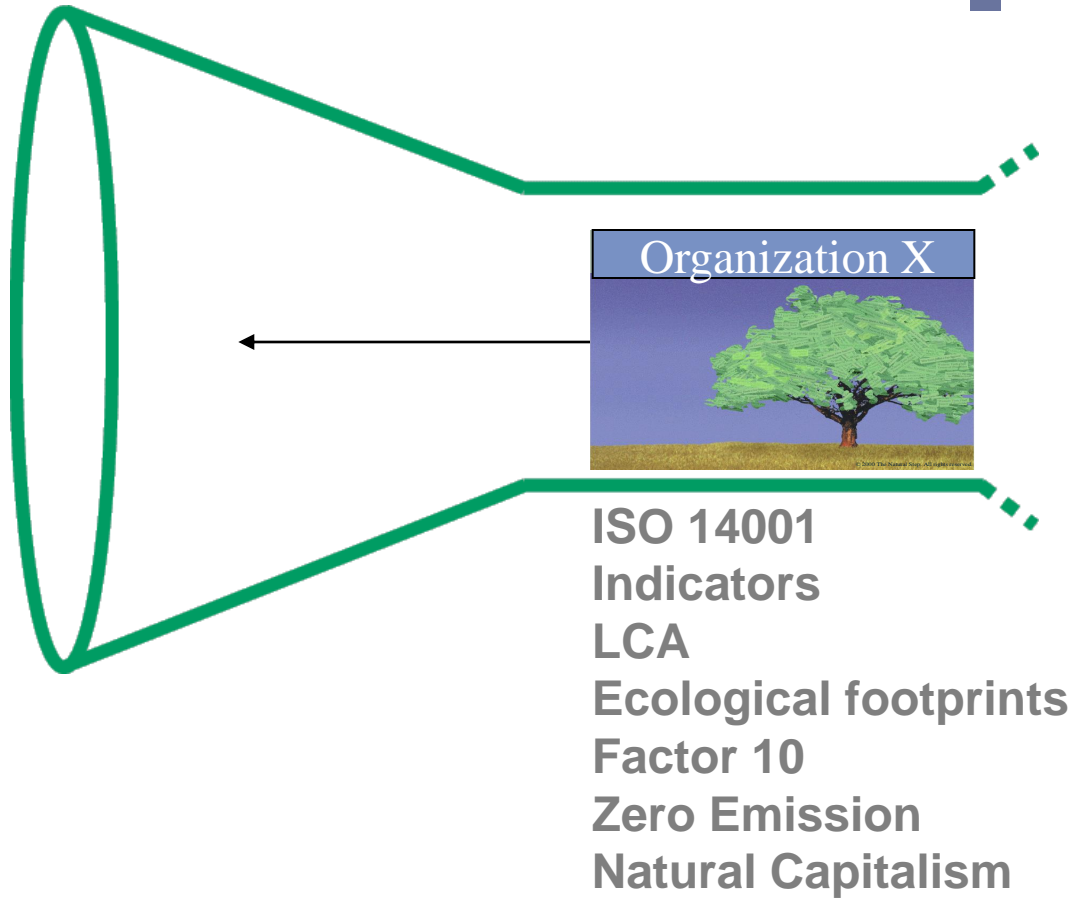
Level 5, tools and concepts

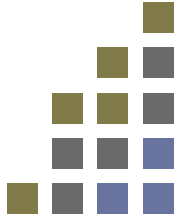
ISO14001
EECA
Miljömålen
CSR
Faktor 4
Life Cycle Analysis
Factor 10
EMAS
LCA
Ecoefficiency
Renewables
Zero Emission
Sustainable growth
Cleaner Production
Agenda 21
Sustainability analysis
Hannover Principles
Triple bottom line
Natural Capitalism
Ecoliteracy
Ecological Footprinting
Sustainability
RMA





Level 5, tools and concepts





Level 5, tools and concepts

Conclusions:

- **Structured systems perspective is not a “tool”**
- **Many good tools and concepts**
- **Different strengths and gaps**
- **None can replace structured systems perspective**
- **Such increases the value of concepts and tools**
- **Get going and select tools as needed**



Sustainable Development

More about competence than values

Part 2

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Åbo, 14 December 2009

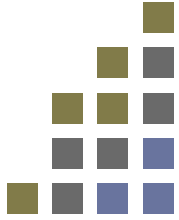
the NATURAL STEP



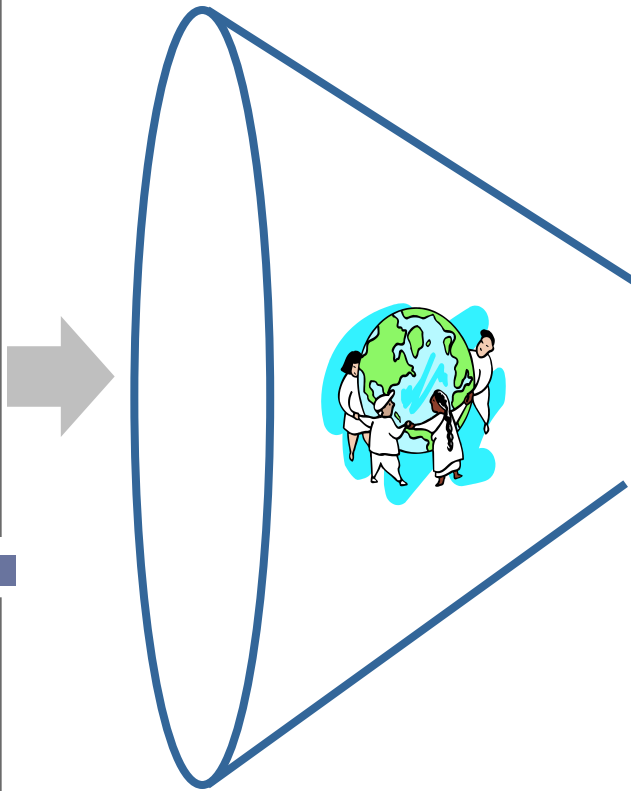


3 Magic Questions

- Do you have a definition of sustainability?
- ...so, what is your gap?
- ...so, what do you do strategically to bridge it?



S.D profitable also in loneliness

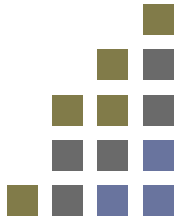


Threats

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SSD Framework

System



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Strategy



Action



Tools



Sustainable vision





Level 2, basic sustainability principles

In the Sustainable Society, Nature is not subject to systematically increasing...

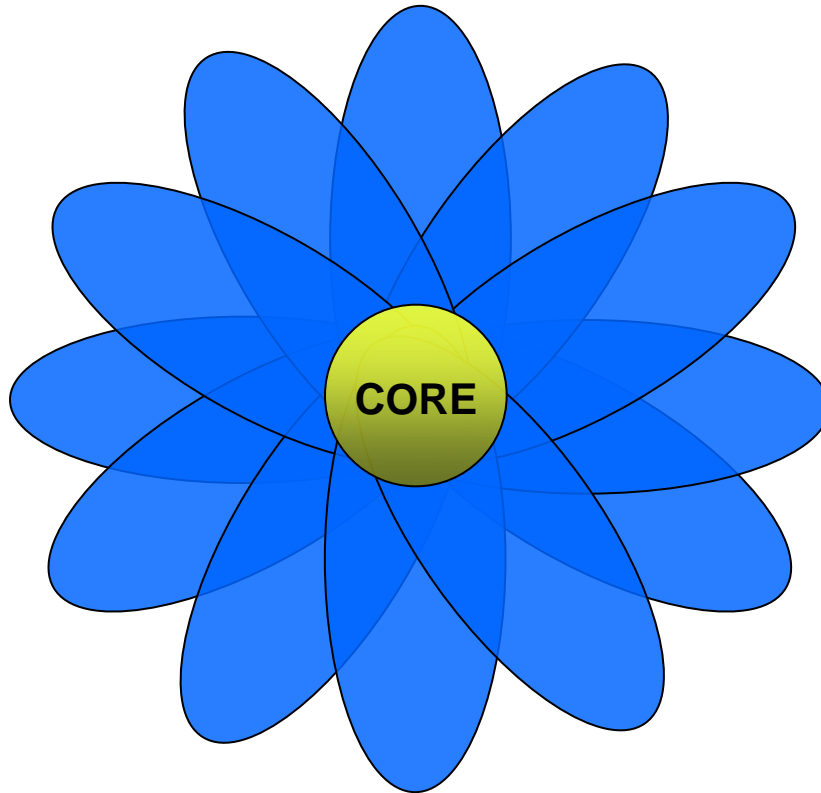
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- 2 ...concentrations of substances produced by society.
- 3 ...degradation by physical means.

and

- 4 ... people are not subject to conditions that systematically undermine their capacity to meet their needs.



International breakthrough for “Real Change”



...Trans-disciplinary, Cross-sector and Cross-cultural Research and Implementation for Strategic Sustainable Development...

...Invented and developed in Sweden

...Multi-stakeholder base funding – Vinnova, NVV, Nutek, Formas, Energimyndigheten...



The Core SSD program partners

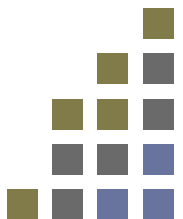
**Blekinge Institute of
Technology (BTH)**

**Lund Institute of
Technology (LTH)**

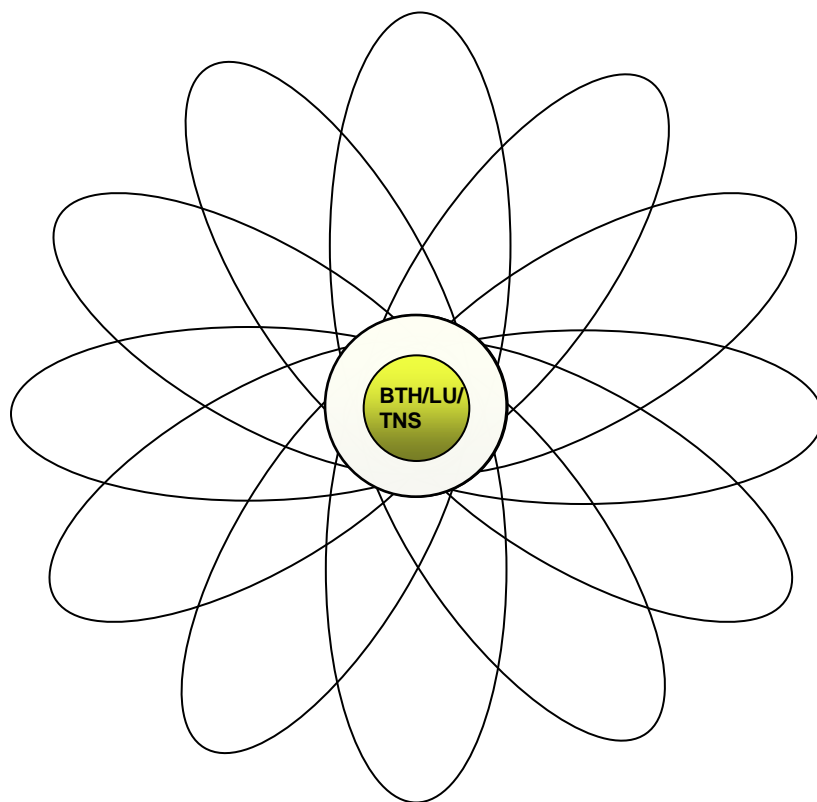
**The Natural Step
International (TNSI)**

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Core



Theme:

Theory, method and tools,
Social Sustainability.

Lead:

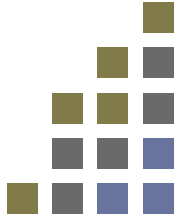
BTH, LU, TNS

Volume:

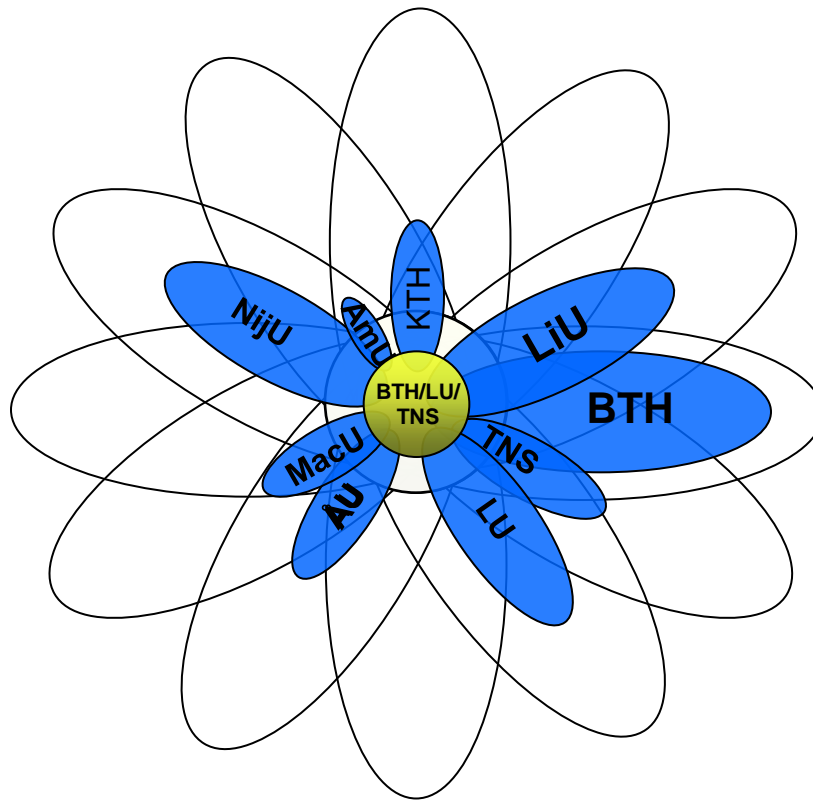
6 MSEK

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Real Change – status, March 2009



Themes: 12

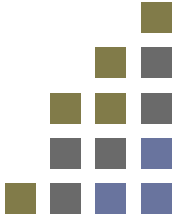
Coordination:

Prof's Göran Broman & K-H Robèrt, BTH
(project 4)

Volume 2008:

5,6+56,5 \approx 61 MSEK

Over and above education
and direct contributions
from partners

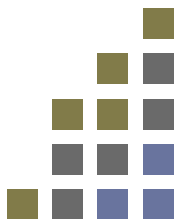


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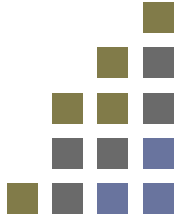


Electrolux





METAL	IN TOP SOIL (MG/KG)	Weath./Volc. (W) (KTON/YEAR)	MINING (M) (KTON/YEAR)	FOSSIL FUELS (F) (KTON/YEAR)	(M+F) / W
Al	72 000	1 100 000	18 000	34 000	0,047
Fe	26 000	390 000	540 000	34 000	1,5
Ti	2 900	44 000	2 500	1 700	0,095
Cr	54	830	3 800	34	4,6
Cu	25	380	9 000	55	24
Pb	19	290	3 300	85	12
Cd	0,35	5,3	20	3,4	4,4
Hg	0,09	1,4	5,2	10	11

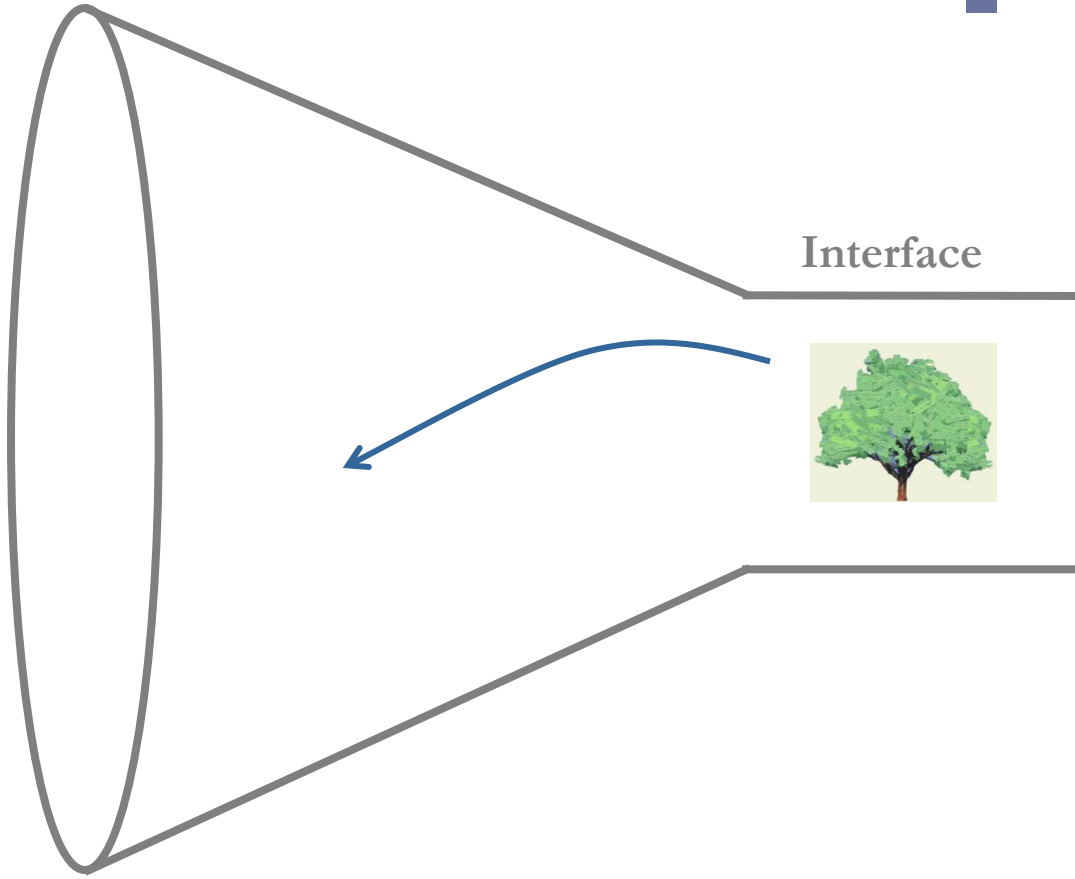
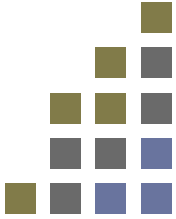


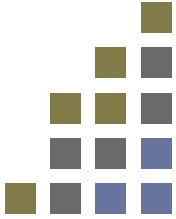
Strategic opportunities

"It was not until at least ten years later we understood how much money Electrolux had saved and earned from applying the FSSD methodology to foresee changes on the market and in legislation".



Leif Johansson



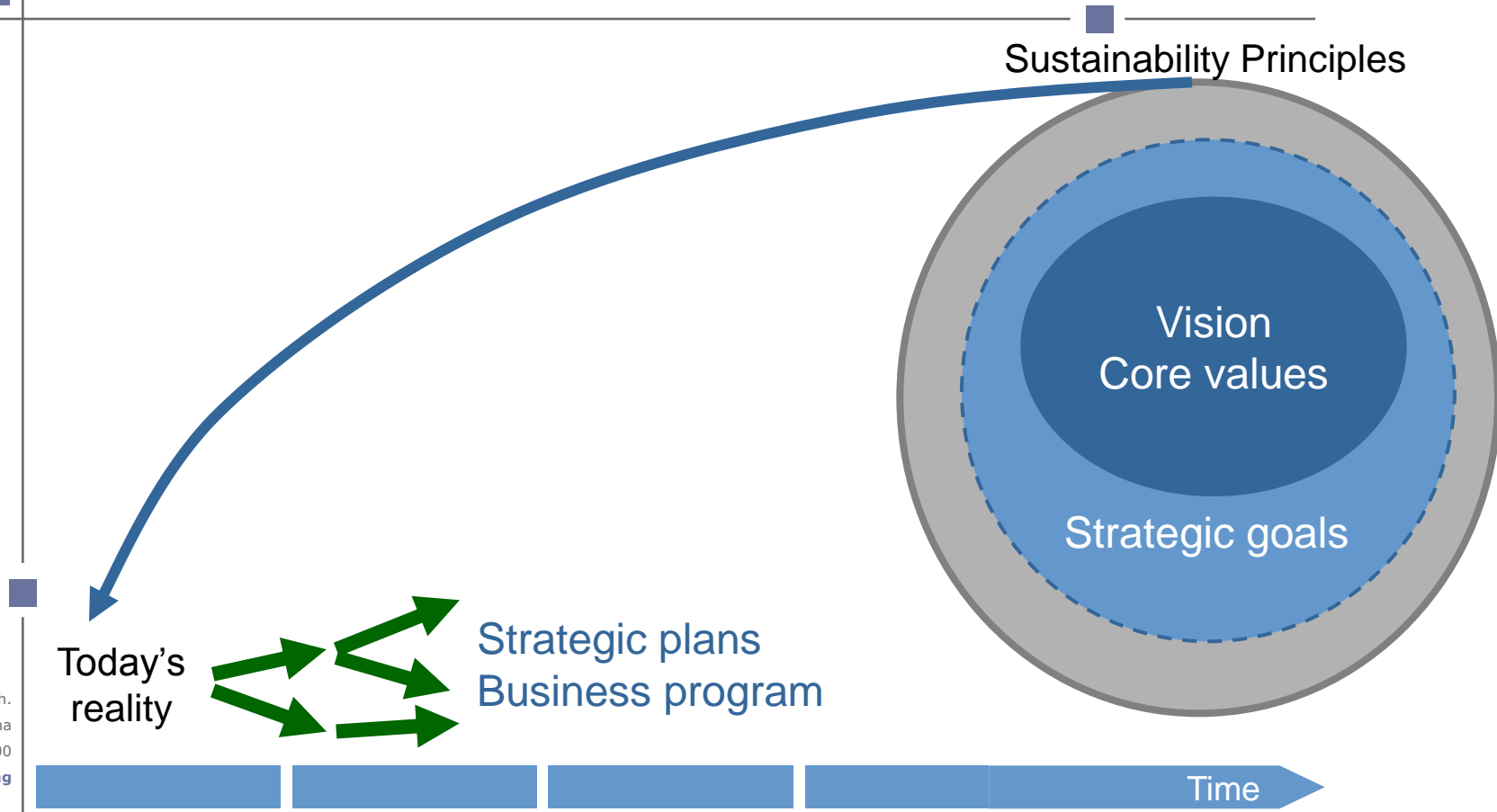


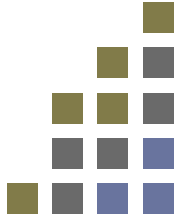
“As we climb mount Sustainability, with the four FSSD principles at the top, we are doing better than ever on bottom line business. This is not at the cost of social or ecological systems, but at the cost of our competitors who still haven’t got it”.



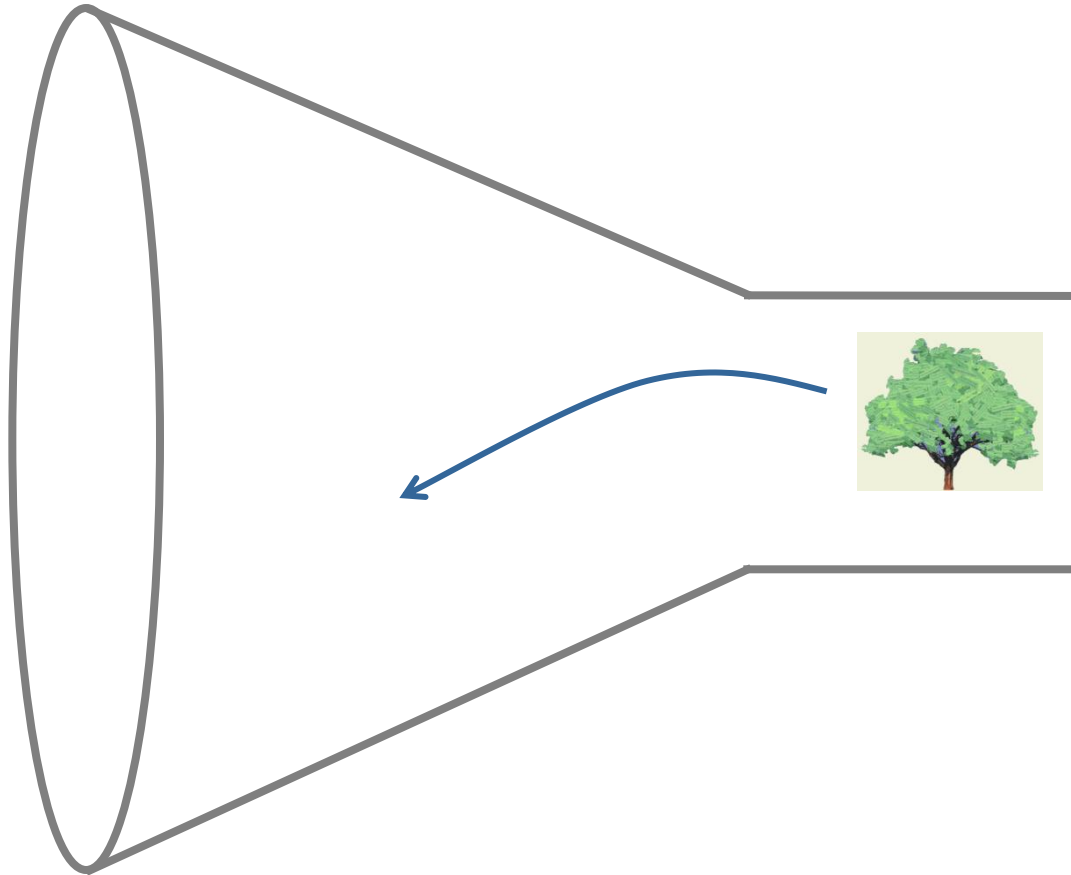
Integrating corporate goals with sustainability

- and understanding the business case of it -



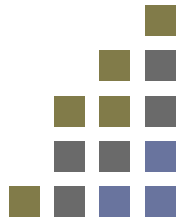


Level 4, action for sectors



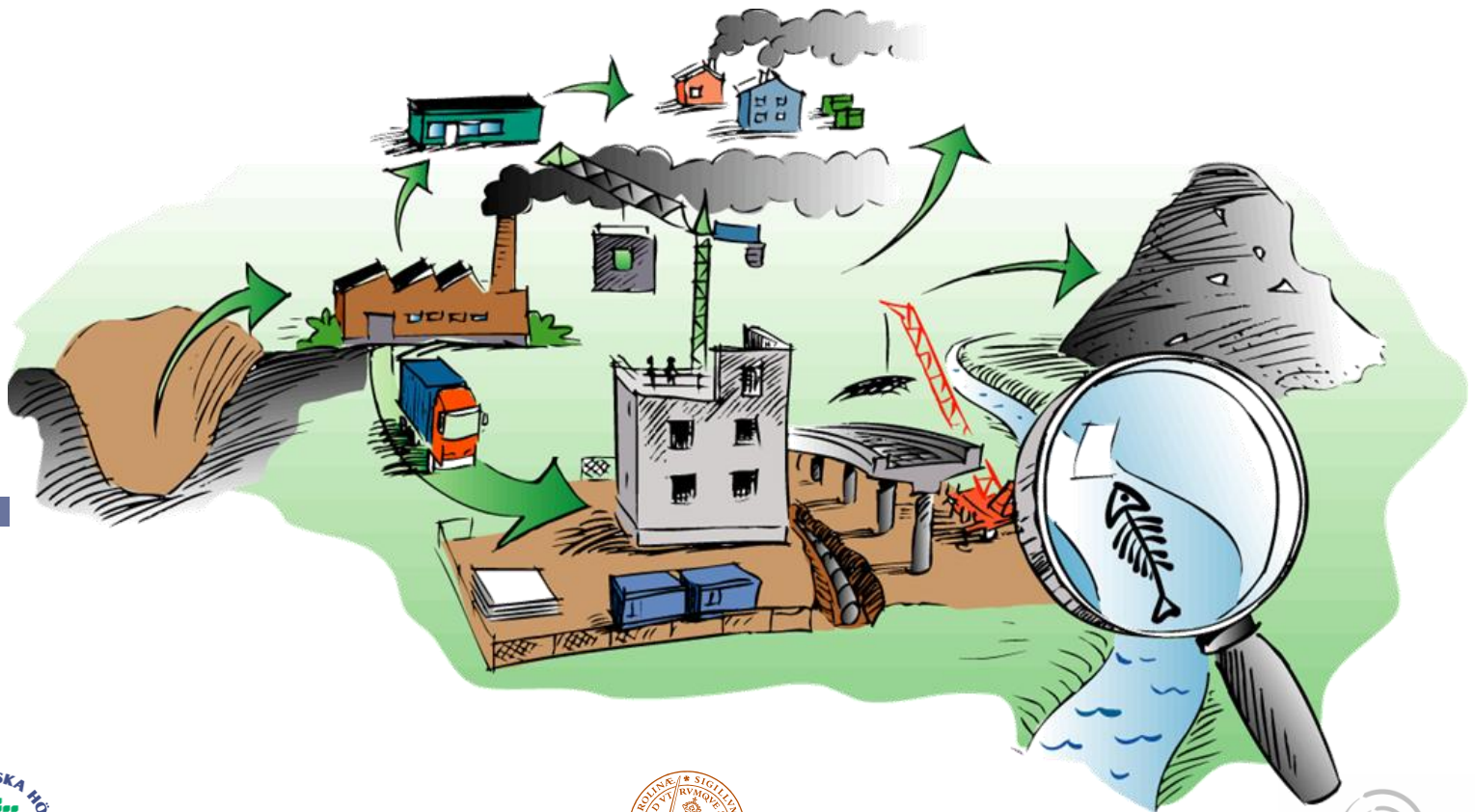
Agriculture
Forestry
Energy
Traffic
Materials

...



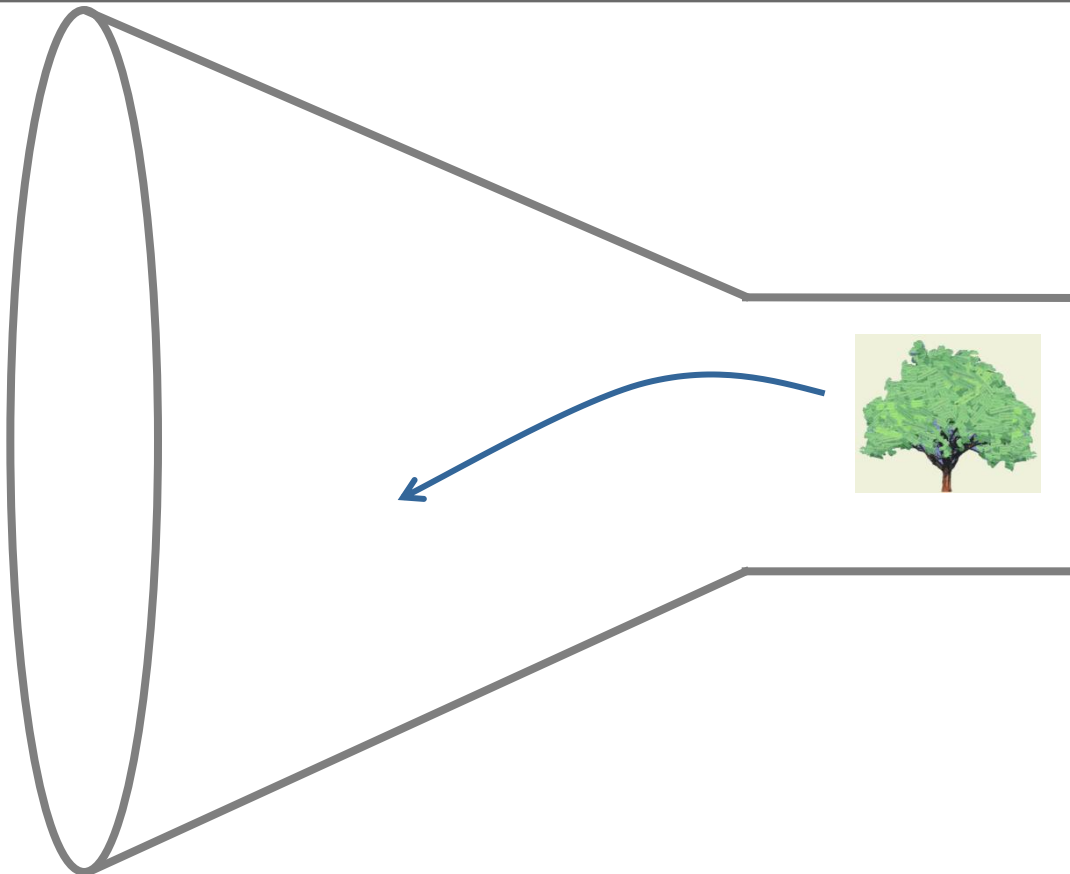
... many actors, same language

- from "fix" to innovative systems solutions -





Level 4, actions for government



Övertorneå
SEKO (70 local gov's)
Whistler
Calgary
FCM
Portland
APA
EU Round Table
Chequamegon Bay
Madison WI
Portsmouth NH
Lawrence NJ
Pittsburgh/Vandergrift
Evanston IL
Duluth MN
Jefferson County WI
Corvallis OR
Dublin



WHISTLER2020 & The Natural Step

Integrating Sustainability Across our Community

Aug. 30th, 2007

Ken Melamed
Mayor,
Resort Municipality of Whistler



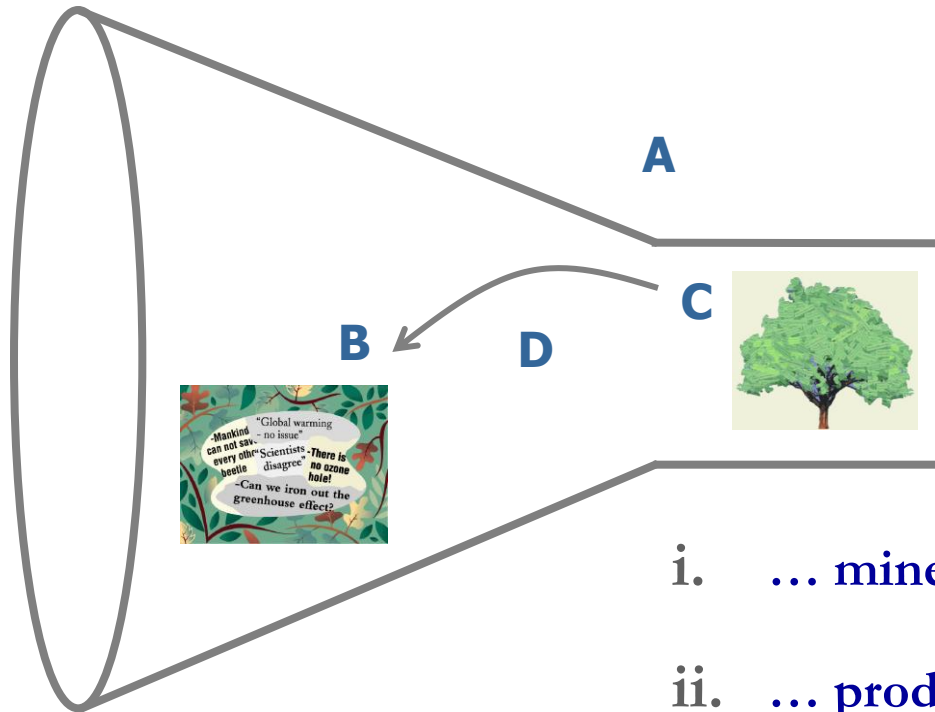


Ken Melamed
Mayor
Whistler, Canada

“This simple, science- and systems-based framework is the best out there. It needs to become part of a new common language, as well understood worldwide as the rules of soccer”.



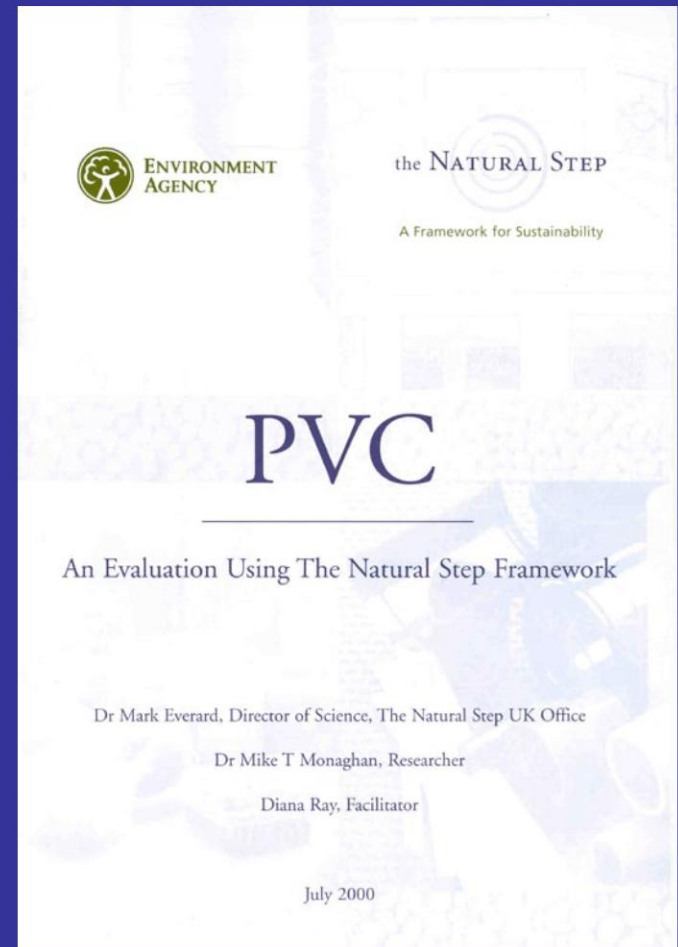
Example – Hydro Polymer case



- i. ... mined materials.
- ii. ... produced substances.
- iii. ... physical encroaching.
- iv. ... social tissue.

Sustainability Evaluation of PVC using TNS Framework

- Addressed by a leading environmental authority in the UK and chaired by J Porritt of the PVC Coordination Group
- Forum for the Future – licensee of TNS Framework in the UK
- What would it take to make PVC fully sustainable?
- 2020 Vision Exercise
 - Involving 36 stakeholders at Tesco headquarters, UK
- Report Produced in July 2000
 - Based on TNS methodology
 - Interviews with Industry and Greenpeace
 - Identifies 5 key sustainability challenges





- ◆ No more carbon to atmosphere
- ◆ Closed loop recycling
- ◆ No accumulation from emissions
- ◆ No accumulation from additives
- ◆ Challenging the whole value chain...



Distance Learning Course:

Leading Change for a Sustainable Chemical Industry

Autumn 2007 - Spring 2008

Economic

In a sustainable society, nature is not subject to systematically increasing concentrations of substances extracted from the earth's crust.

Environmental

In a sustainable society, people are not subject to conditions that systematically undermine their capacity to meet their needs.

Social

In a sustainable society, nature is not subject to systematically increasing degradation by physical means.

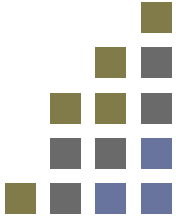
Political

In a sustainable society, people are not subject to conditions that systematically undermine their capacity to meet their needs.

A smiling man and woman are sitting at a desk. The man is seated, wearing a light pink shirt and a patterned tie, looking at the camera. The woman is standing behind him, wearing a blue blazer and a pearl necklace, also smiling. A silver laptop is open on the desk in front of them.



the NATURAL STEP



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► SUSTAINABILITY



Our Sustainability Journey

Our Vision and Commitments
for a Sustainable Future

Our New Approach to Sustainability

Moving to the Next Level

Leadership

Integration

Compliance⁺

Compliance

Denial



Our Vision

Rohm and Haas has always been dedicated to using science to make the world a better place.

Today, we have six Commitments to incorporate sustainability in everything we do, challenging us to deliver solutions for a healthier, more sustainable future.



Six Interdependent Commitments Define Our Future



Our People

We are admired for our commitment to each other and to our work, which drives personal fulfillment and company success, as well as promotes a healthier society.



Innovation for Tomorrow

We contribute to the sustainability of society and our planet by developing innovative technologies for current and future markets.



Smart Solutions

Our technologies enable our customers, and their customers, to develop products and services for a more sustainable future.



Raw Materials for the Future

The materials we start with and benefit from are used safely and efficiently, as well as respect nature's limits and support the development of society.



Partners for Change

We are leaders in advancing all aspects of sustainable development, openly collaborating with customers, suppliers, communities and governments.



Responsible Operations

Our infrastructure has a positive impact on our company, our communities and ourselves; our operations are a model for others, at home and abroad.



Planning with Success in Mind

Backcasting

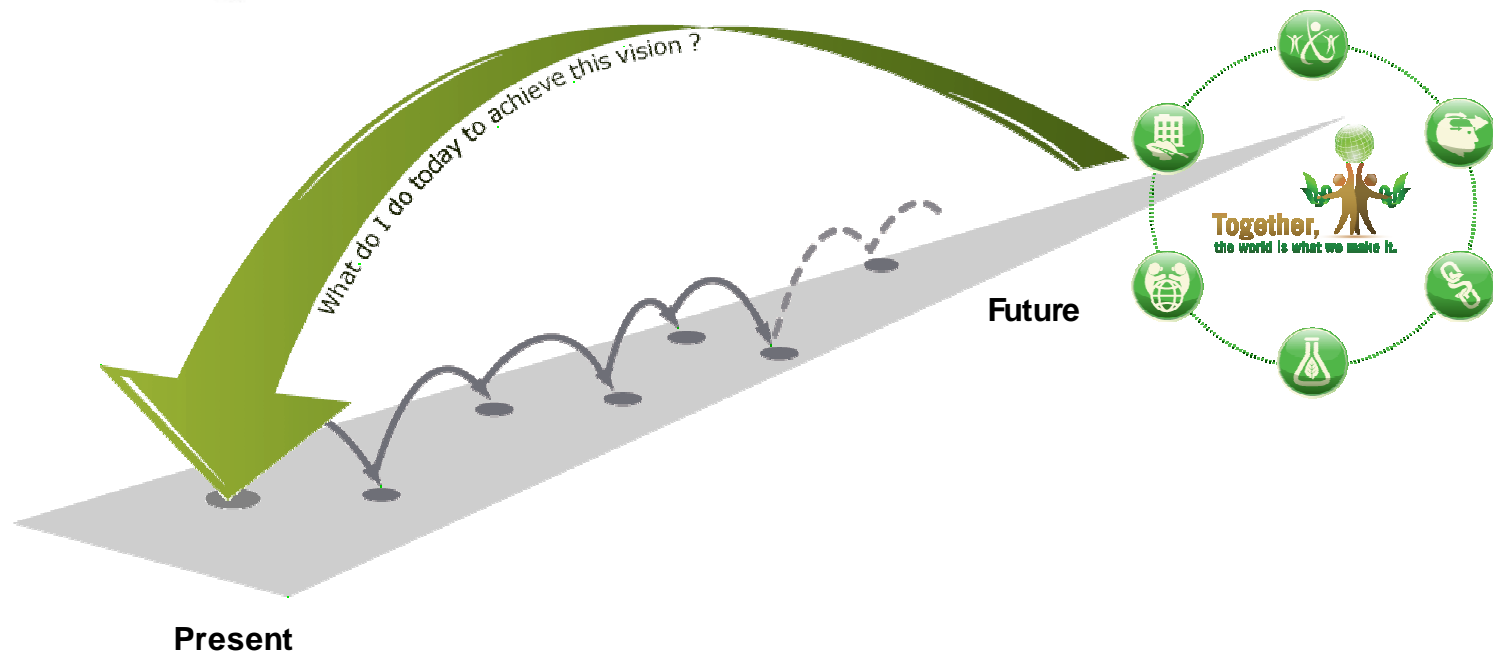
Envision yourself in a sustainable future.



Planning with Success in Mind

Backcasting

Envision yourself in a sustainable future.





Smart Solutions

Sustainability Life Cycle Assessment (SLCA)

Identifying more sustainable raw materials for PVC

- ▶ Conducted a Sustainability Life Cycle Assessment (SLCA) for PVC Heat Stabilizers
Valbonne Lab, Spring 2008
- ▶ Received the 2007 Hydro Sustainability Award from Hydro Polymers and The Natural Step

Life Cycle Stages	Sustainability Principles (SP)			
	SP1	SP2	SP3	SP4
1. Raw Materials				
2. Synthesis				
3. Packaging & Distribution				
4. Processing				
5. Use During Lifetime				
6. End of Life				

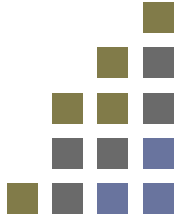
*For Internal Rohm and Haas Use



Conclusion

Strategic Sustainable Development...

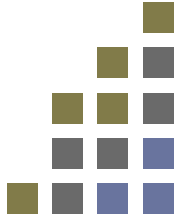
- ...departures from principled definition of sustainability.
- ...greatest business opportunity ever.
- ...is profitable regardless if others “get it” or not.
- ...is headed by leaders, not experts.
- ...step-wise open ended “chess-like” approach.
- ...coordinates dep:ts, disciplines and sectors.
- ...deals with multidimensional tradeoffs.
- ...allows calculations of sustainable resource potentials.
- ...allows to set system boundaries.



Objection 1

We cannot afford S.D!

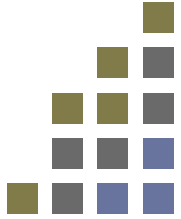
(Invalid; we cannot afford non-sustainability)



Objection 2

We cannot afford S.D now!

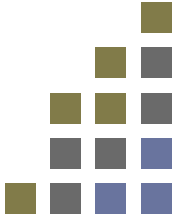
(Invalid; stepwise approach always possible)



Objection 3

We cannot afford going all the way!

(Invalid; we do not want to plan for bankruptcy)



Objection 4

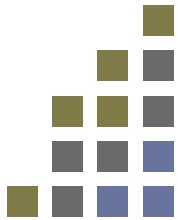
Resource potential does not suffice!

(Invalid; there is a great surplus)

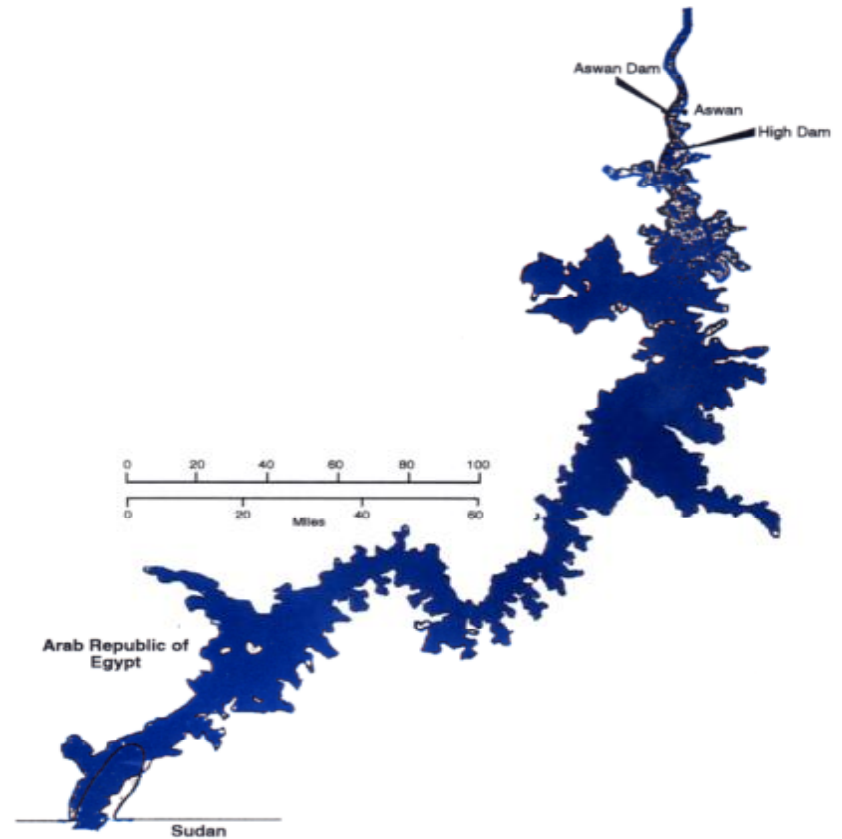


Resource potential from sun 10.000 x

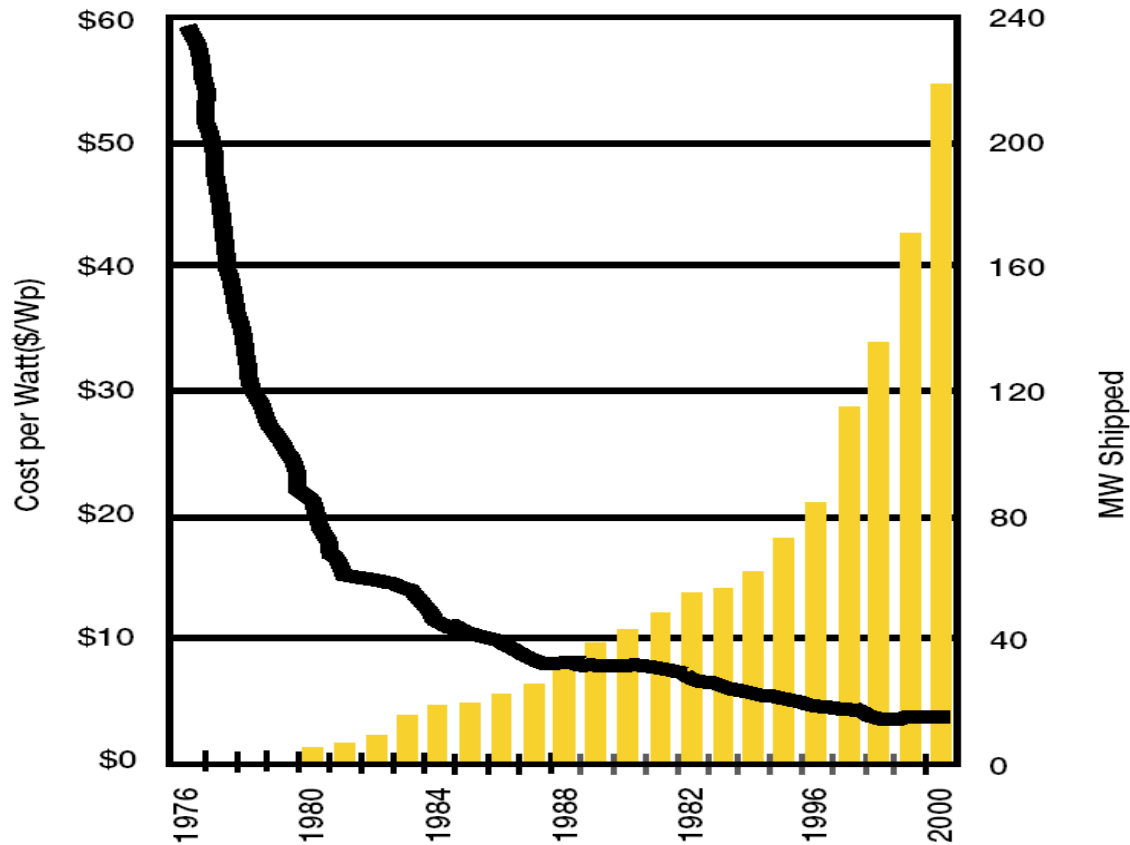




Land use of PV's vs. Dam



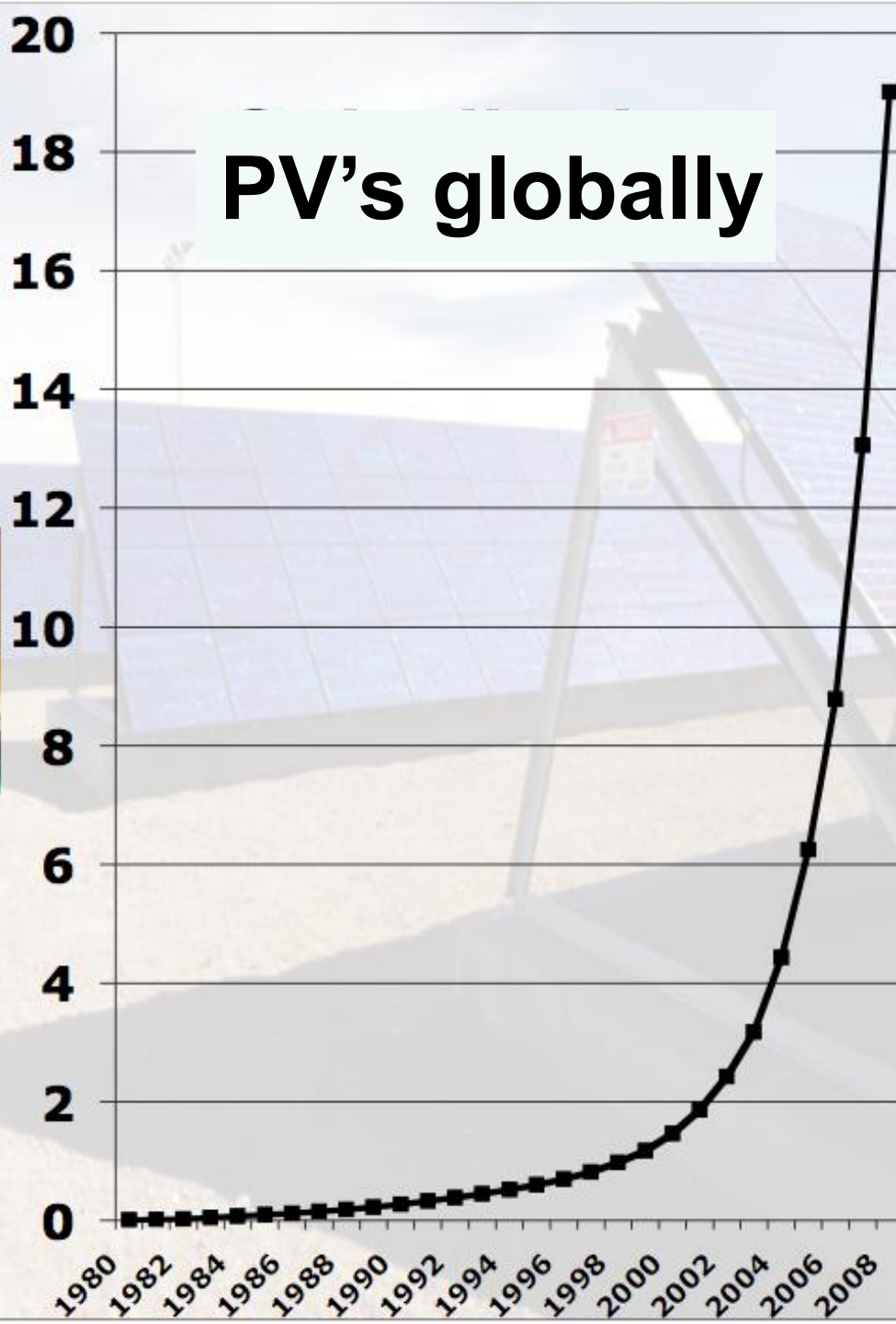
PV's learning curve



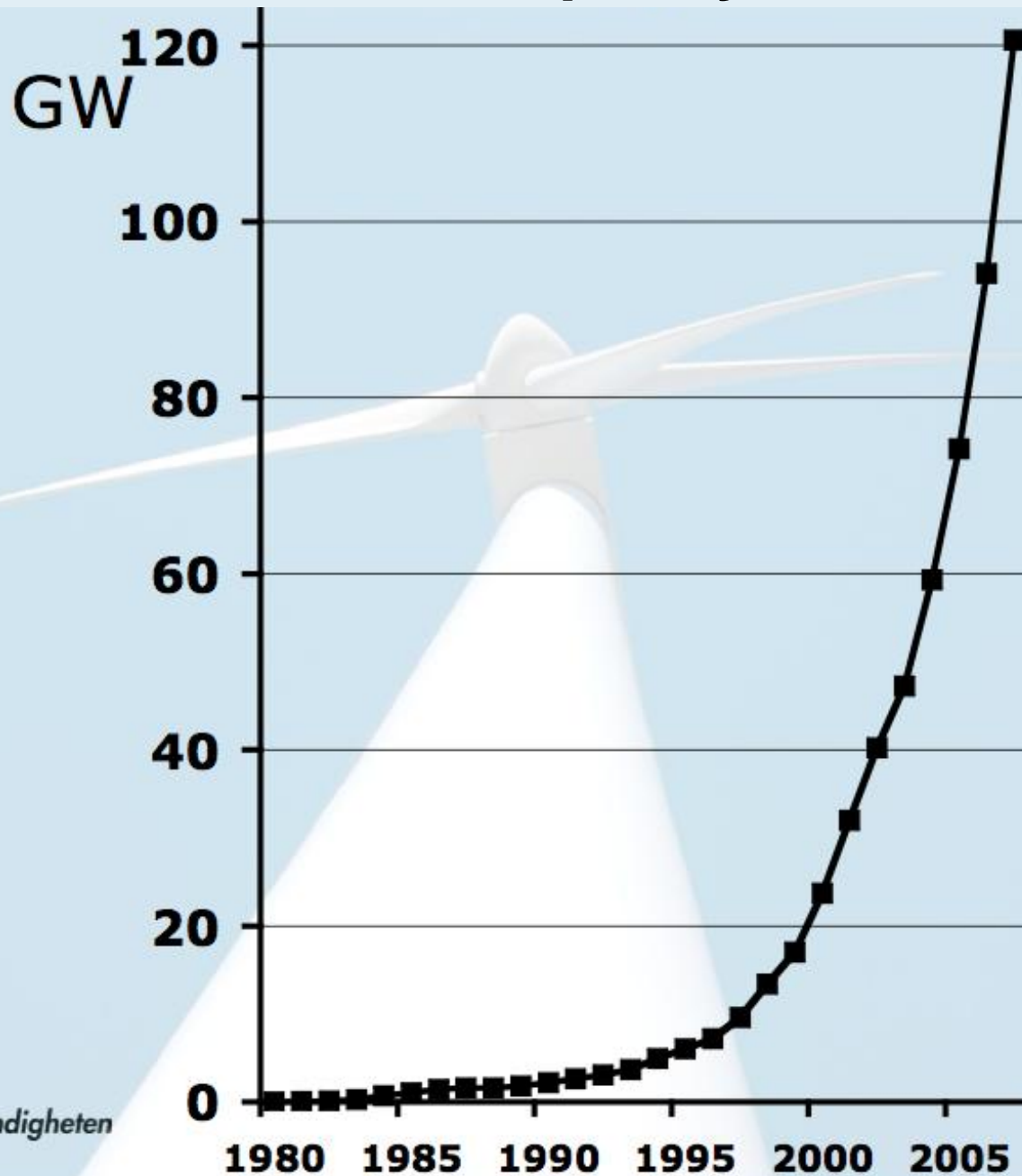
*Solar Generation,
European Photovoltaic
Industri Association
& Greenpeace, 2001*

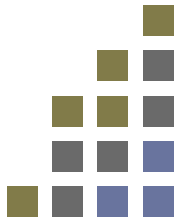
PV's globally

GW_p

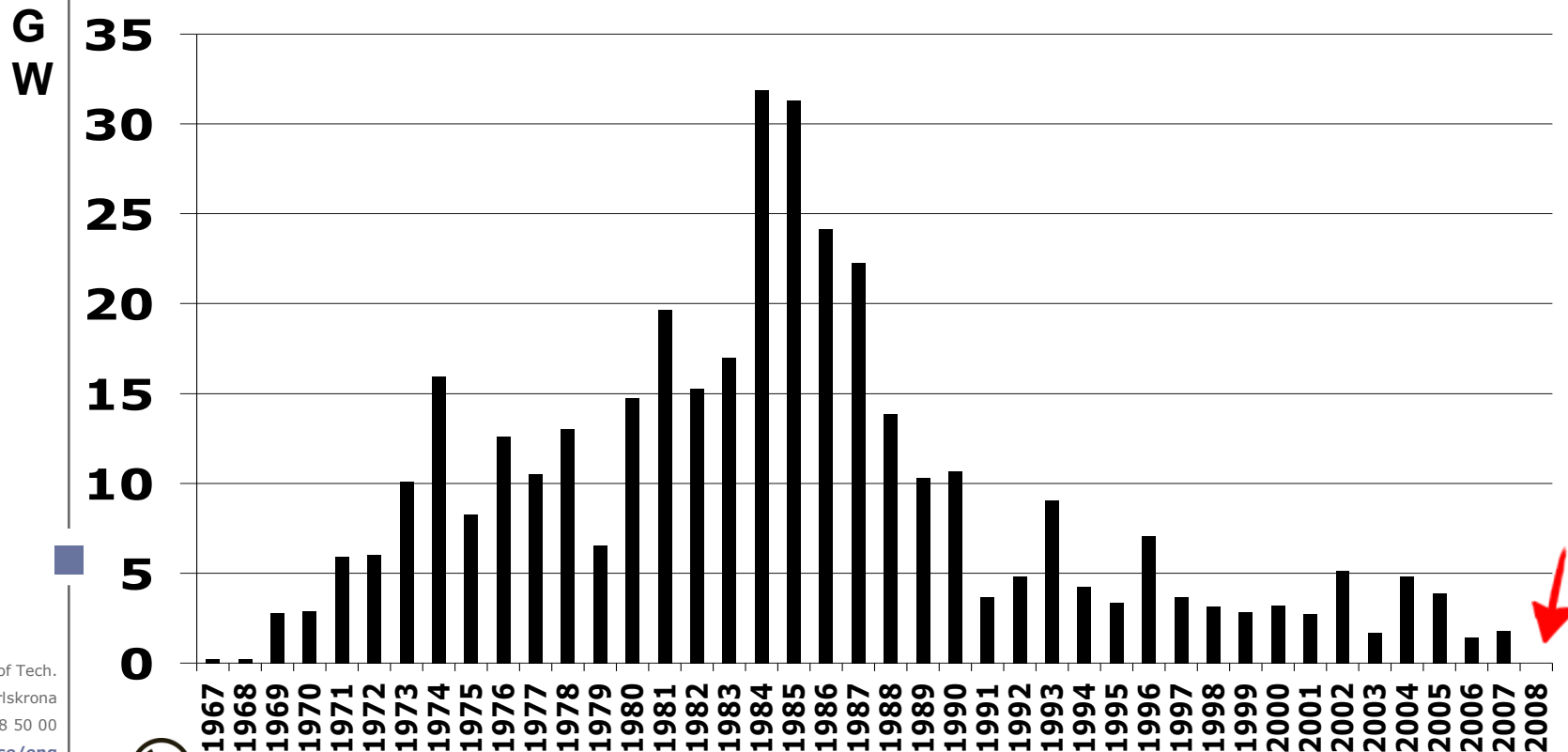


Global wind capacity 1980-2008





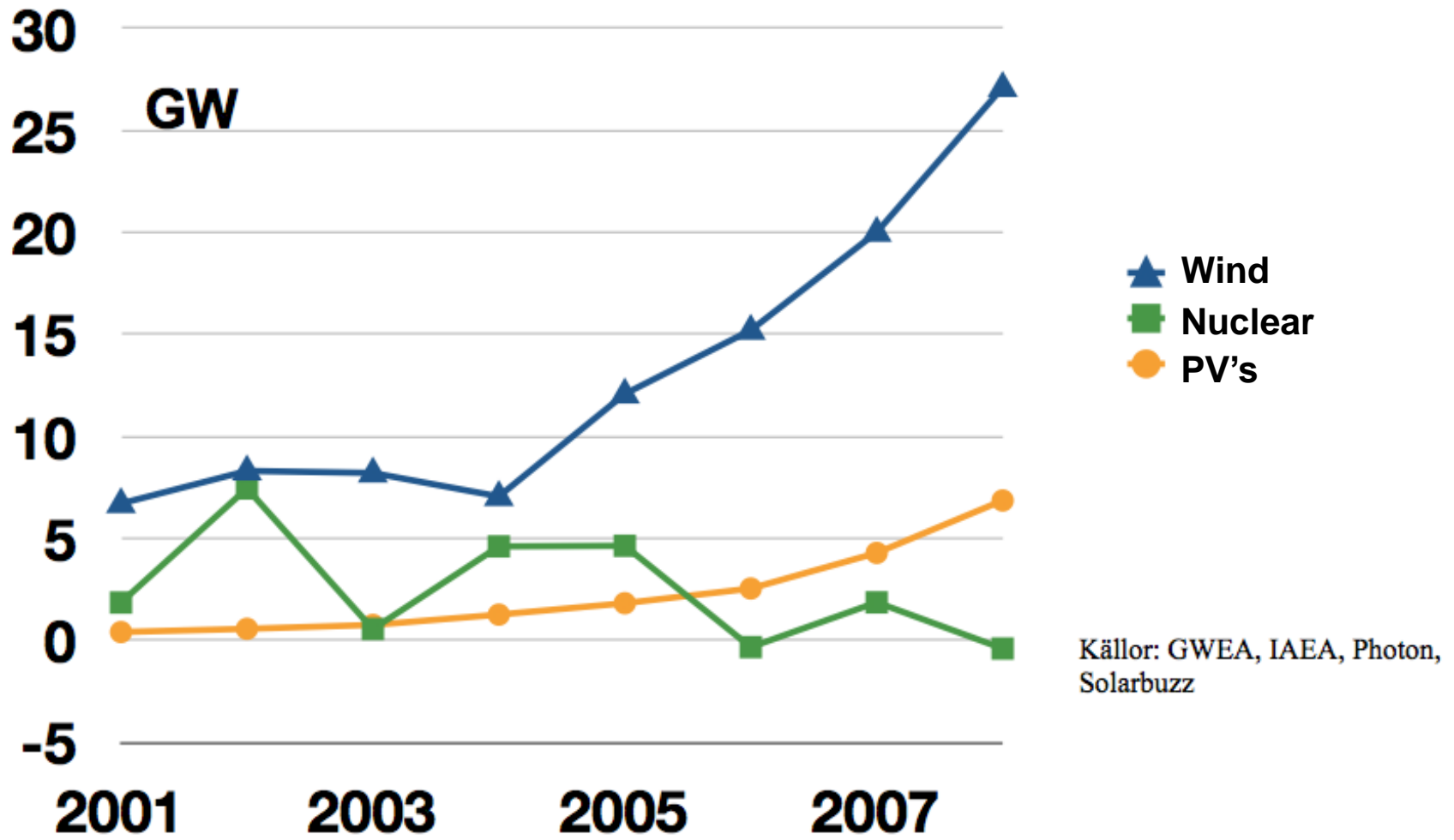
Nuclear capacity, start year



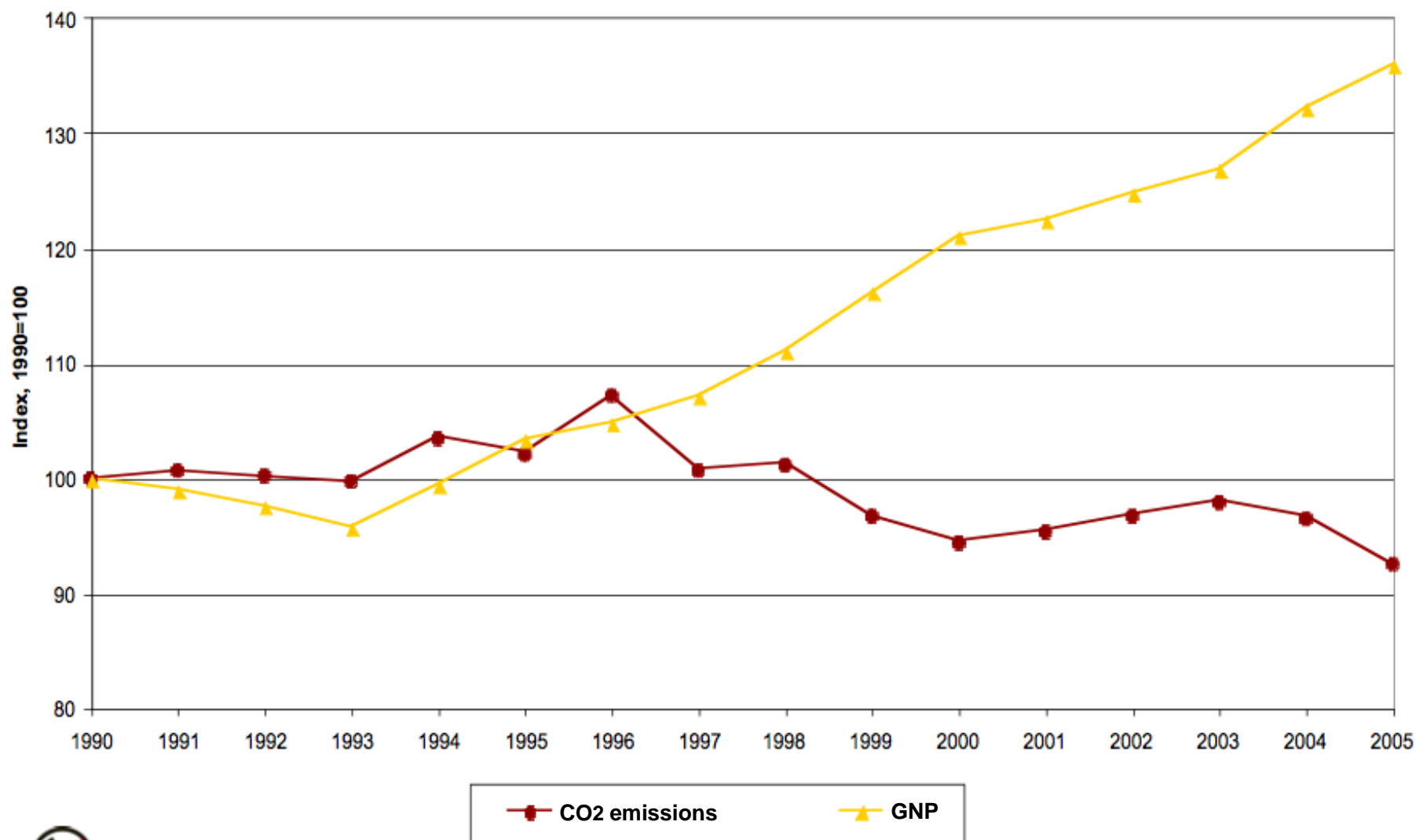
Blekinge Inst. of Tech.
SE-371 79 Karlskrona
+46 455 38 50 00
www.bth.se/eng

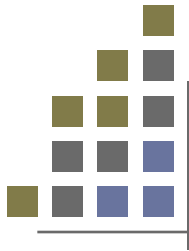


Global installation, GW

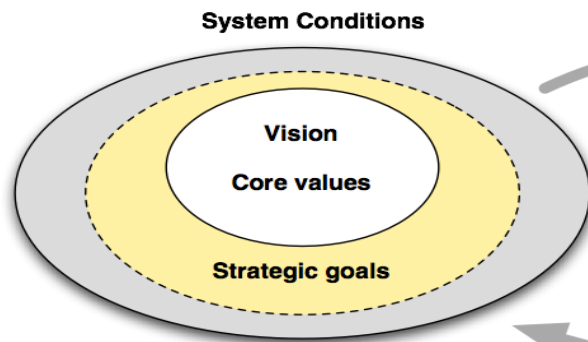


Swedish GNP and fossil CO2 emissions ("de-coupling")





Strategic Integrated System Development



Public review

ABCD analysis

Expert consultation:

- Agriculture
- Energy
- Forestry
- Infrastructure
- Regional planning
- ...etc.

ABCD evaluation

Gov. and non-Gov. evaluation:

- Political goals
- GOV Institutions
- Business
- NGOs
- Public forum, etc

Vision
↑
Today

Resource Base

- Waves, geothermal
- PV's, wind...
- Integrated biomass
- Surplus biomass
- Petroleum

Energy Carrier

- Battery
- Fueled electricity
- Synthetic diesel
- Diesel
- Gasoline

Engines

- Battery cars
- Fuel cells
- Hybrids
- Diesel
- Otto

Infrastructure

- Nexus planning
- Logistics / IT
- Combi traffic
- Bus commuting
- Car commuting

Social System

- Participatory democracy
- Cross-sector cooperation
- Interdisciplinary cooperation
- Compartmentalisation
- Relative Ignorance

Vision and strategic goals used to plan through scenarios

www.bth.se/eng

