Future Prospects - Technology Foresight for Tackling Global Challenges

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State of the World and Development (course)

Sustainable Global Technologies (programme)

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TFF Technology Futures Forum

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VTT

Structure of the lecture

1. Futures research and technology foresight

2. Sustainability, globalisation, technology

3. State of the World and Development
   * Club of Rome
   * Millennium Project (AC/UNU)

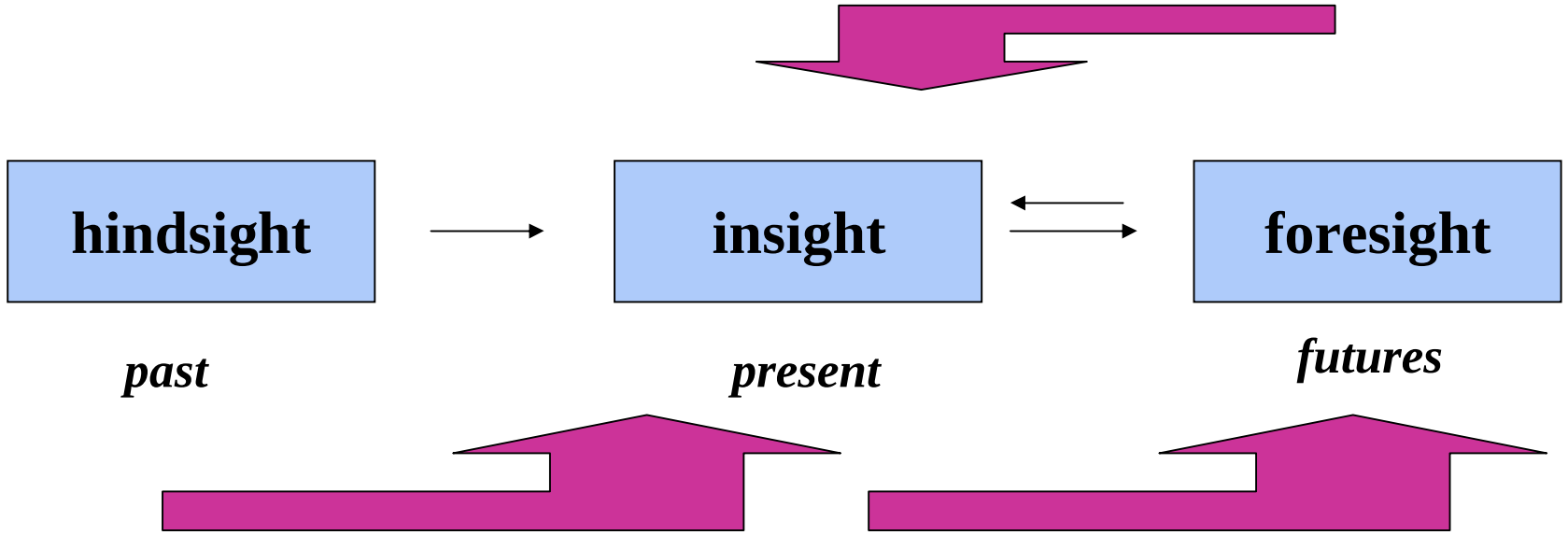
4. "Five Regions of Technology"

1. Futures Research and Technology Foresight

- based on open mindset: futures thinking
- alternative futures - not one future
- possible, probable, and preferred futures
- help us prepare for the future
- constructing the future

Futures Research and Technology Foresight

Deal with all three dimensions of time:



Technology Foresight

= opening the windows to the future
by exploring the futures landscape

- within the larger framework of future research
- involving many stakeholders
- participatory
- multidisciplinary
- often including roadmap working
- action-orientated
- part of innovation process and policy
- learning process

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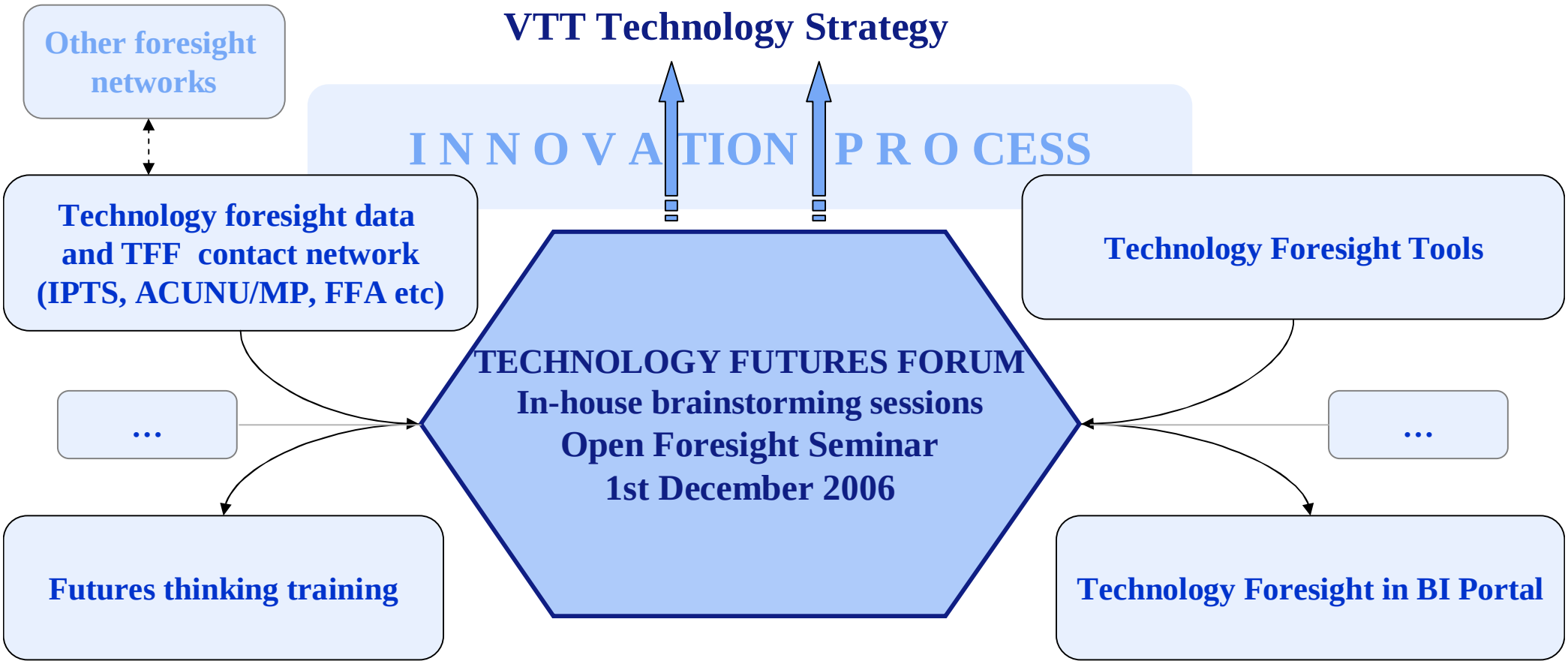
DEVELOPMENT OF VTT'S FORESIGHT ACTIVITIES



Futures Intelligence/Foresight Intelligence

VTT 31.1.2006

2. Sustainability, globalisation, technology

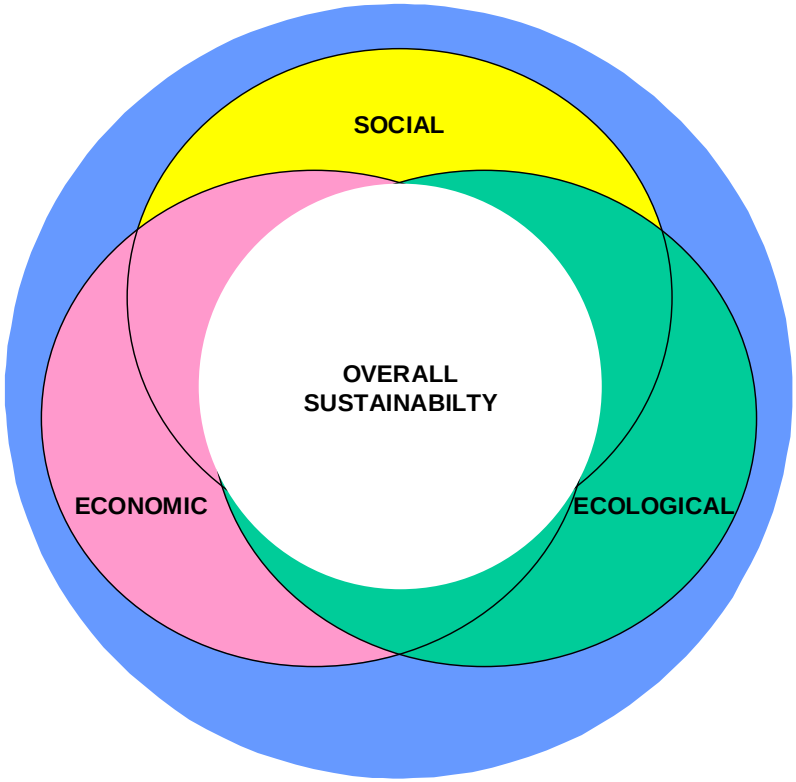
Definition of sustainable development:

“Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs”

The United Nations World Commission on Environment and Development report

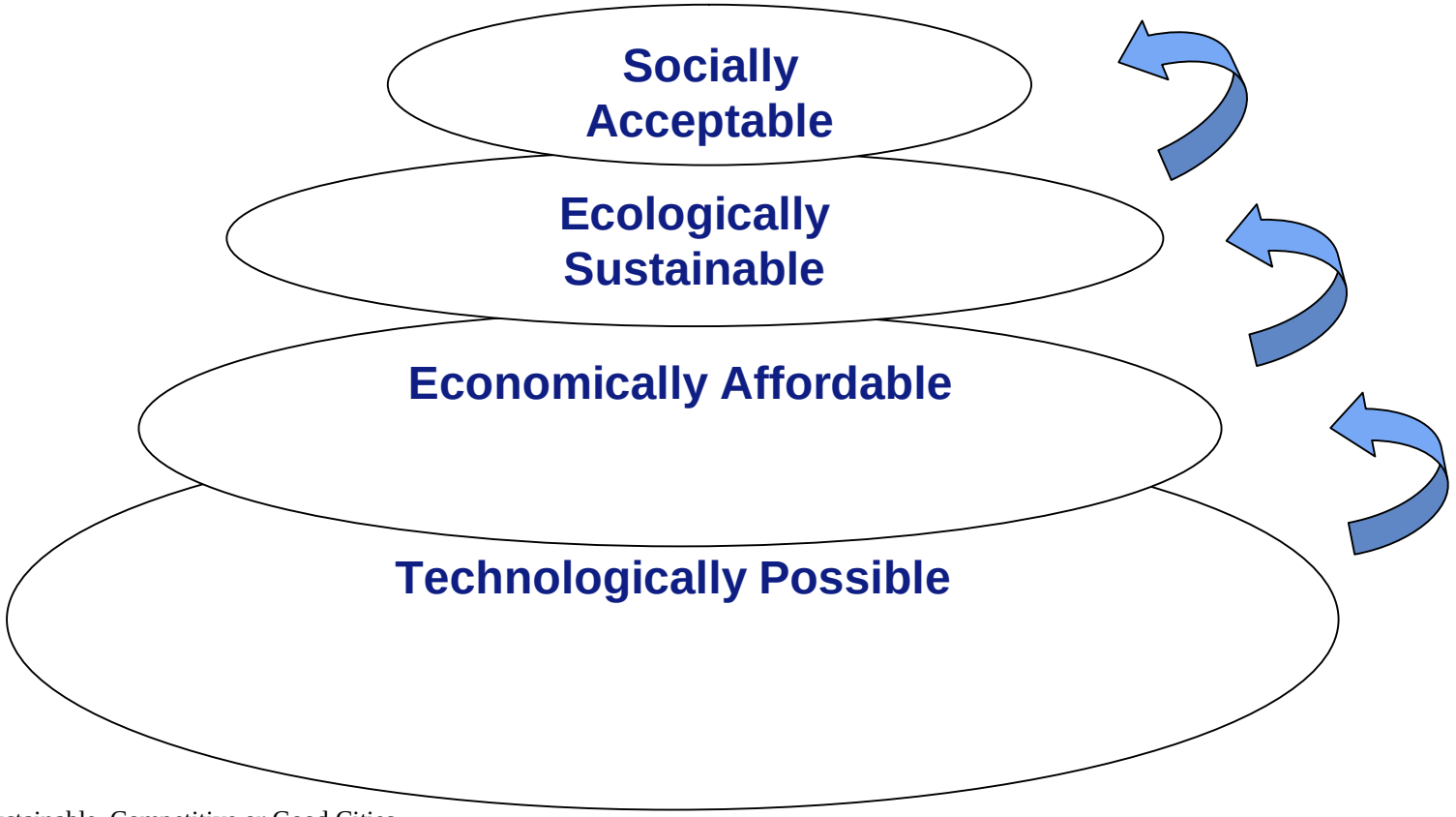
"Our Common Future" 1987, 43

Three Basic Dimensions of Sustainability



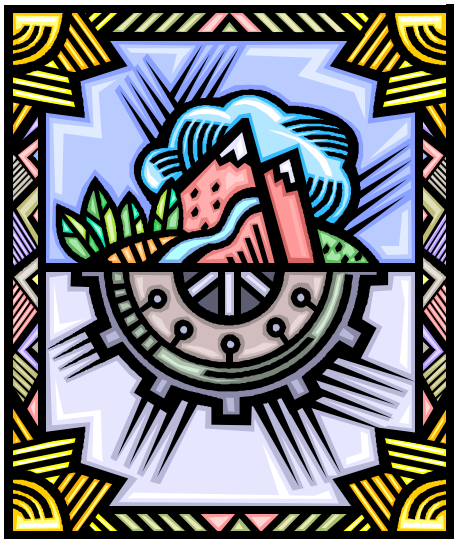
Sirkka Heinonen and Pekka Lahti: Sustainable, Competitive or Good Cities - Bake a Cake or Make a Fake? Futura 2/2002.

Different Dimensions of Sustainable Development in a Hierarchical Succession



Sirkka Heinonen and Pekka Lahti: Sustainable, Competitive or Good Cities - Bake a Cake or Make a Fake? Futura 2/2002.
Lahti 1991.

The Connecting Logic:
Sustainability, Globalisation, Technology



Technology ⇐ **tools**

to promote ⇐ **goal**

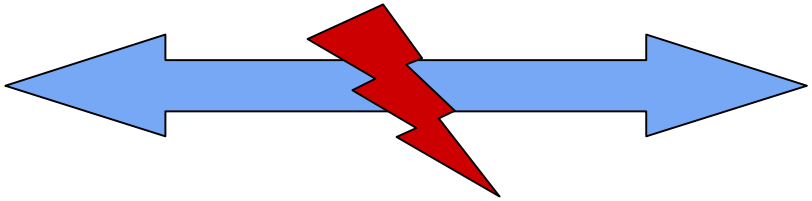
Sustainable Development

In the Global World ⇐ **context**

Global challenges

Sustainable development

Information society



crucial challenge to combine the gap

3. State of the World and Development

*** Club of Rome**

*** Millennium Project (AC/UNU)**

Global futures studies

two major global think tanks

The aim is to recognise key global problems
and try to resolve them

Club of Rome

Establishshed 1969 (http://www.clubofrome.org)

Limits to Growth 1972

Limits to Growth - 30 years update 2004

The Finnish Association for the Club of Rome, FICOR (www.roomanklubi.fi)

HUMAN QUALITY
Aurelio Peccei (industrialist + "philosopher" , founder of the CoR)

- age of unenlightment

- real problems:
  - ignorance
    - intolerance
      - inequality
        - unstability
          - unsecurity

- ethics of life
  - more mature attitudes
    and more responsible society

ENVIRONMENTAL CONCERNS
Ernst von Weizsäcker

• Ernst von Weizsäcker, Amory B. Lovins & L. Hunter Lovins (1998): Factor Four - Doubling Wealth, Halving Our Resource Use

"The amount of wealth extracted from one unit of natural resources can quadraple"

• From productivity of work to productivity of resources "More from Less"

• economic growth vs. sustainable development
  - Better to prevent pollution (correcting mistakes takes money)
  - Ecological footprint

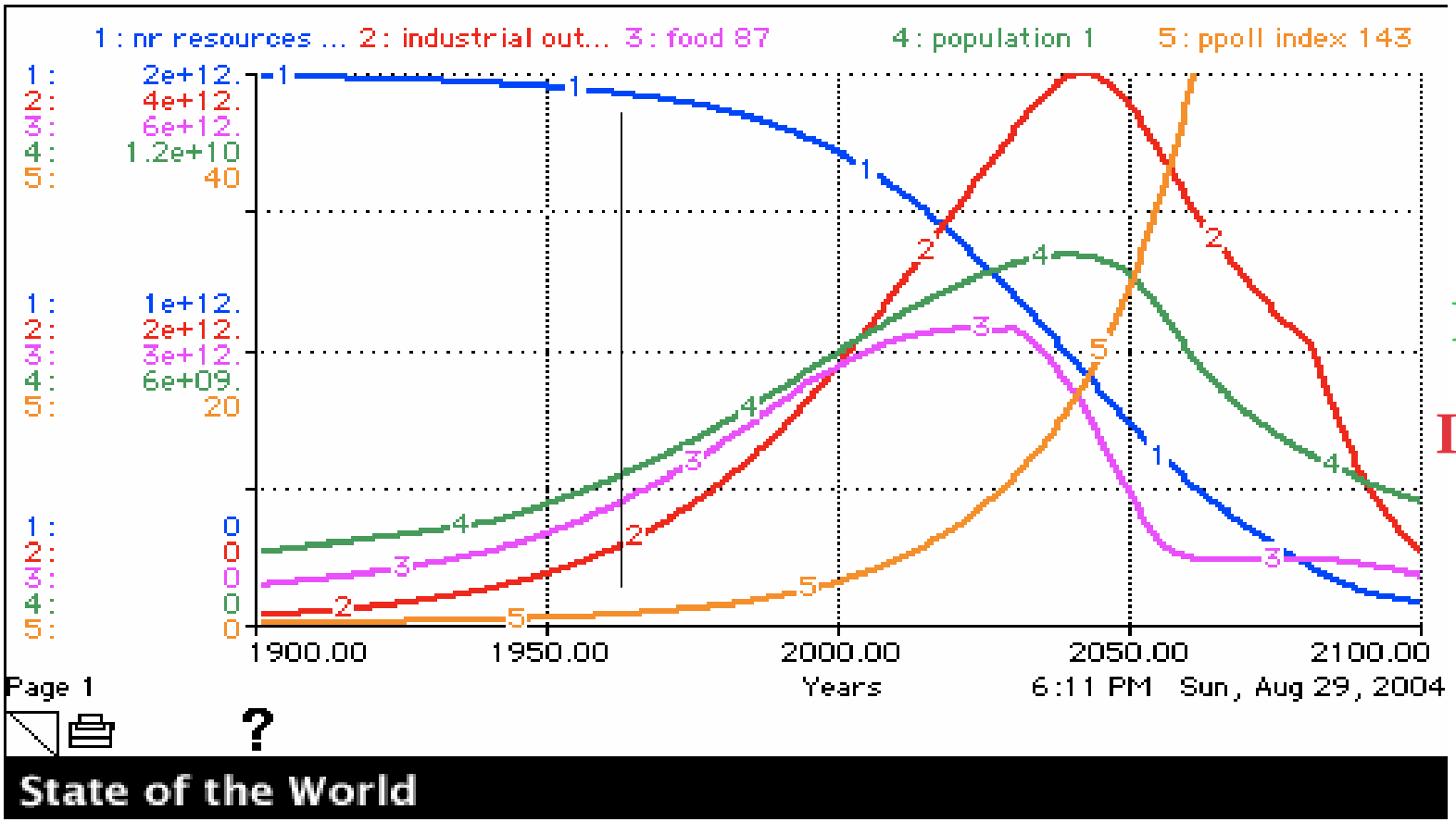
• climate change
  - Complex meteorological system
  - Global imperative to do something to decrease greenhouse gases

• Limits to Growth - a major challenge to continue to this
  - Factor Four only gives us some more time - 40-50 yrs
  - We have to create sustainable society with no growth of energy and materials

FiCoR, with the kind help of Dennis Meadows and Jorgen Randers,

promoted Limits to Growth -30 year update

to be published in Finnish (2004)



Pollution

Population

Industrial Output

Food

Resources

CONCORDANCE OF VALUES
Chair of the Club of Rome, Jordanian Prince El Hassan bin Talal

- humanitarian challenges
- human security, not just economic or political security
- hard security vs. soft security

- anthropolitics -
  politics where people matter,
  where vulnerable groups matter
- universal values should be accentuated in cultural interaction:
  one world civilization - ten thousand cultures (Mircea Malitza)

Mission of the Club of Rome

- to identify crucial global problems and seeking for solutions - two main clusters of global problematique can be outlined:

humans - nature: starvation, desertification, lack of clean water, climate change, natural catastrophes

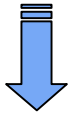
human-human: wars, conflicts, crises, terroris greed, selfishness, indifference, lust for power

Resolutique needed is based on the ethics of life:

responsibility towards nature

responsibility towards fellow humans

responsibility towards oneself



MISSION HOPEFULLY NOT IMPOSSIBLE

CONCEPTUAL FRAMEWORK OF THE CLUB OF ROME MISSION

Responsibility towards nature

to develop sustainable societies

Responsibility towards fellow humans

to develop welfare, solidarity and understanding of diverse cultures

Responsibility towards oneself

to develop knowledge, skills and values as well as to nurture hope

Millennium Project

- **AC/UNU Millennium Project**
- **global participatory think-tank**
- **established 1996**
- **Jerome Glenn, Ted Gordon**
- **29 nodes (Helsinki node 2001)**

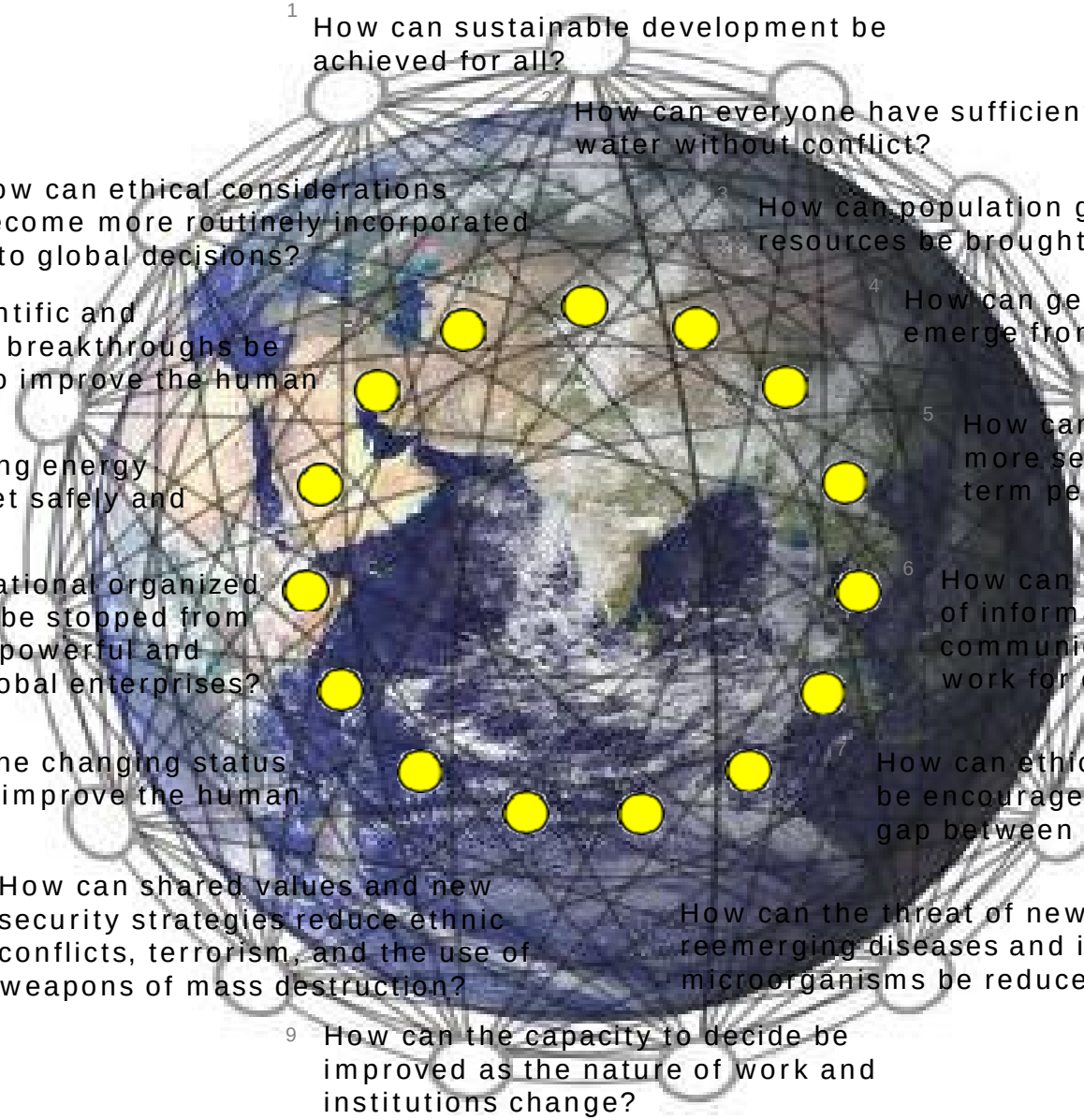
(www.acunu.org)

Millennium Project

Millennium Project

- **State of the Future Reports**
- **scenarios, Delphi etc**
- **15 global challenges**

15 Global Challenges



1 How can sustainable development be achieved for all?

2 How can everyone have sufficient clean water without conflict?

3 How can population growth and resources be brought into balance?

4 How can genuine democracy emerge from authoritarian regimes?

5 How can policymaking be made more sensitive to global long-term perspectives?

6 How can the global convergence of information and communications technologies work for everyone?

7 How can ethical market economies be encouraged to help reduce the gap between rich and poor?

8 How can the threat of new and reemerging diseases and immune microorganisms be reduced?

9 How can the capacity to decide be improved as the nature of work and institutions change?

10 How can shared values and new security strategies reduce ethnic conflicts, terrorism, and the use of weapons of mass destruction?

11 How can the changing status of women improve the human condition?

12 How can transnational organized crime networks be stopped from becoming more powerful and sophisticated global enterprises?

13 How can growing energy demands be met safely and efficiently?

14 How can scientific and technological breakthroughs be accelerated to improve the human condition?

15 How can ethical considerations become more routinely incorporated into global decisions?

American Council for
The United Nations University
The Millennium Project

The Future will be more …than most people we think

Just 25 years ago, there was no…

- Internet, World Wide Web, PCs, or mobile phones
- European Union, WTO, ICC, or NATO in Eastern Europe
- Talk of globalization, genetically modified food, stem cells, or AIDS pandemic
- Asymmetrical warfare, and
- … and most believed that a nuclear WW III would have destroyed the world by now

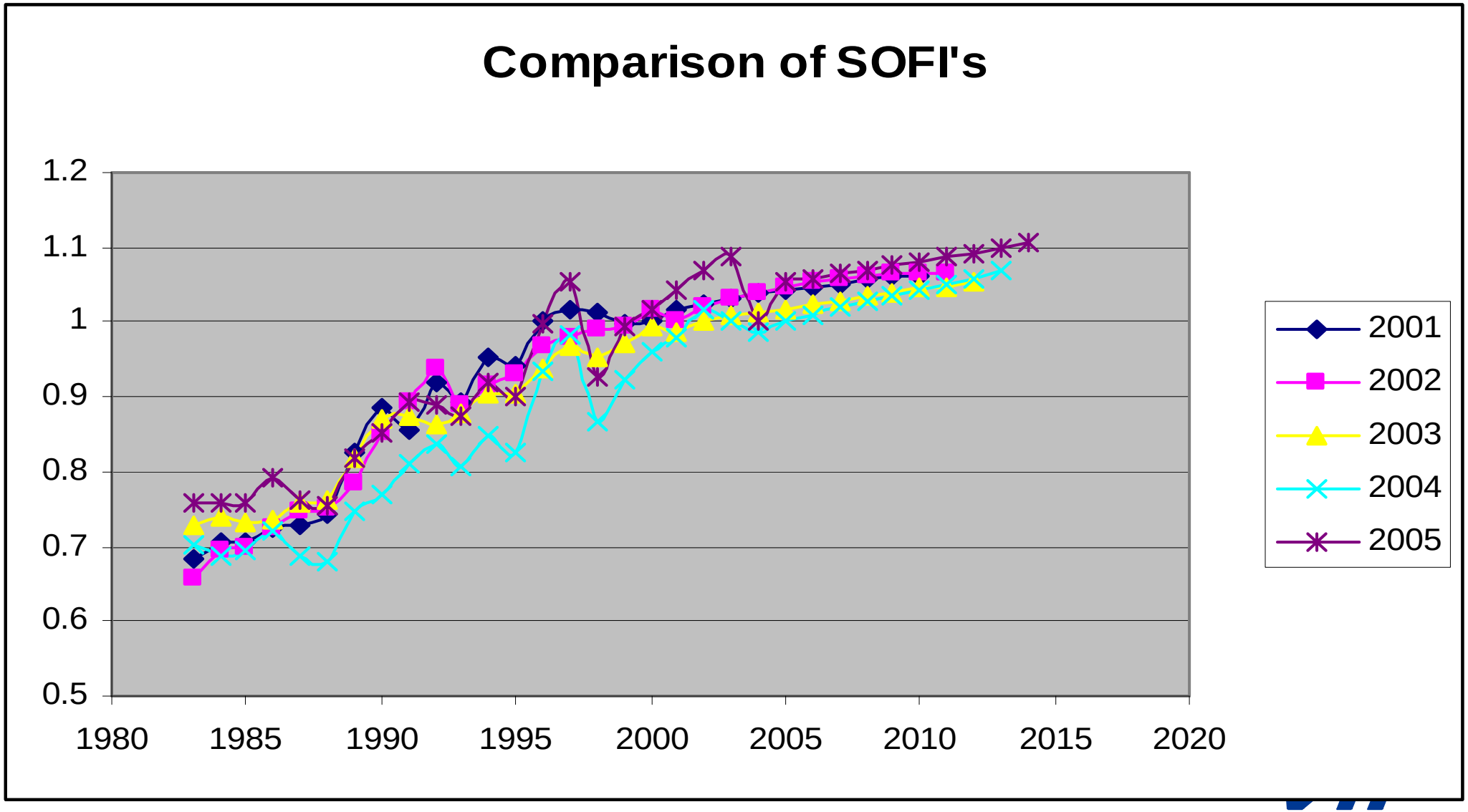
… and the *next* 15-25 years? What emerging technologies, synergies, and ethical implications are coming up?

- Lines of genetic code written like software code to create new forms of life, some merges with computational intelligence (AI)
- More than half the world spends more than half its time in cyberspace more being “real” that 3D reality - cyber space blurring distinctions
- Life extension begins to look like a realistic option
- 3-D printing
- Seawater Agriculture

Emerging Technologies, Synergies, and Ethical Implications (continued)

- Future ICT, marketing, competitive intelligence, info-warfare, info-terrorism, and organized crime may be inter-linking –*How will people know what to trust?*
- SIMADs (Single Individuals Massively Destructive)
- Stem cells from cows, pigs, and goats to produce meat without producing the animal
- Solar Power Satellites for world's electricity needs without producing greenhouse gases or nuclear waste

Global State of the Future Index (MP/ACUNU)



The Global SOFI (State of the Future Index)

The global SOFI shows that the future is getting better,
But not as rapidly as it did over the past 20 years

Where we are winning:	Where we are losing:
• GDP per capita • Food availability • life expectancy • Adult literacy • Infant mortality • access to safe water • Access to health care • School enrollment	• atmospheric carbon dioxide • unemployment • forestlands • number of poor people • AIDS deaths • developing-country debt • terrorist attacks
	

4. Five Regions of the Future

New Approach to Technology

Source: Joel A. Barker & Scott W. Erickson: Five Regions of the Future

Five Regions of the Future

New way to consider/foresee future technology development

➡ TechnEcology ≈ natural ecosystem

Technology is a set of tools, techniques, and knowledge that can be used in combination or separately to solve problems.

Ecosystem is a complex, integrated system made up of diverse living organism that operate in competition and collaboration within system's boundaries.

TechnEcology is a complex ecosystem of technology. The individual elements are made up of the tools and techniques invented by humans that interact in both mutualistic and competitive manners to increase the variety of technologies and the complexity of interaction.

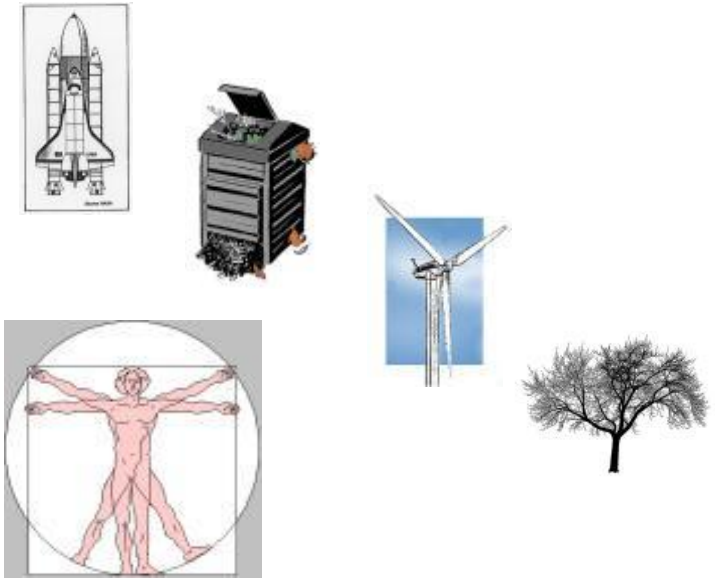
Source: Joel A. Barker & Scott W. Erickson: Five Regions of the Future

A Geography of Technology

So that we can better MAP our FUTURE

➡ 5 regions of the future

1. **the SUPER TechnEcology**
2. **the LIMITS TechnEcology**
3. **the LOCAL TechnEcology**
4. **the NATURE TechnEcology**
5. **the HUMAN TechnEcology**



Source: Joel A. Barker & Scott W. Erickson: Five Regions of the Future

A Geography of Technology

Each TechnEcology can be characterized with the answers to four value questions:

- What is the region's attitude toward *material wealth*?
- What is the region's view of *science and technology*?
- How does the region view its *relationship with nature*?
- What is the region's view of *work and leisure*?

→ to figure out a technology's ***dominant purpose*** or function

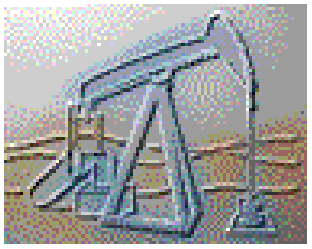
purpose determines place

Source: Joel A. Barker & Scott W. Erickson: Five Regions of the Future

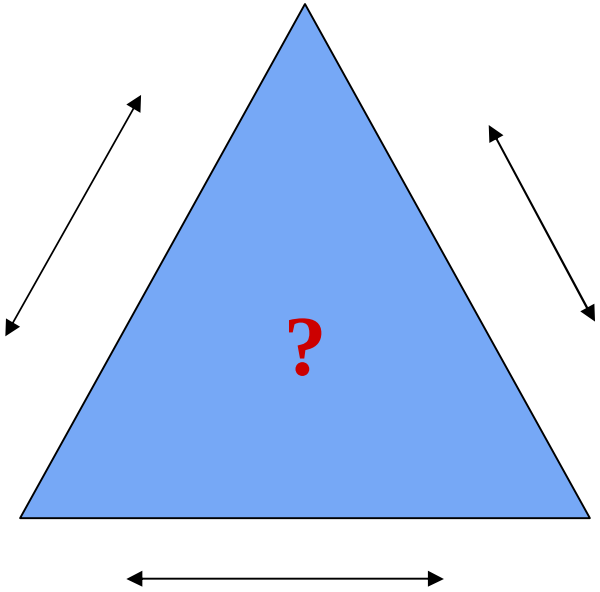
TO CONCLUDE

The Bermudan Triangle Concerning the Future of the World and Development

Population



Energy and Environment



Clash of Cultures/Rise of Fundamentalism

Only if tools/technologies, resources, foresight, will and wisdom are provided

We can make the future constructed as

GLOBALLY SUSTAINABLE WORLD


Thank You!
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