

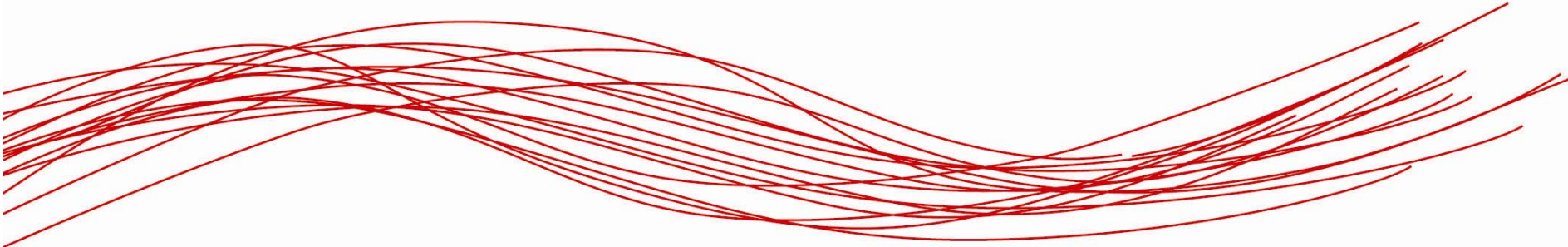


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# Sustainable Neighbourhood – from Lisbon to Leipzig through Research

Leipzig, 8-10 May 2007



## Life Cycle Thinking in 7<sup>th</sup> Research Framework Programme (2007–2013)

European Commission - DG Research

Directorate Environment

Unit I.3 « Environmental Technologies and Pollution Prevention »

**Mr Michele GALATOLA**





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## What's new?

Main new elements compared to FP6:

- Duration increased from five to seven years
- Annual budget increased (from **3800 M€** in FP6 to **7600 M€** in FP7)
- Basic research (~ €1 billion per year)
- New structure: cooperation, ideas, people, capacities
- Flexible funding schemes
- Simpler procedures





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# FP7 Specific Programmes

***Cooperation – Collaborative research***

***Ideas – Frontier Research***

***People – Human Potential***

***Capacities – Research Capacity***

**+**

**JRC (non-nuclear)**

**JRC (nuclear)**

**Euratom**





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# Cooperation

## Ten themes

1. Health
2. Food, agriculture and biotechnology
3. Information and communication technologies
4. Nanosciences, nanotechnologies, materials and new production technologies
5. Energy
6. **Environment (including climate change)**
7. Transport (including aeronautics)
8. Socio-economic sciences and the humanities
9. Security
10. Space

Environment has links with all the other themes





## COOPERATION – Collaborative Research

- Under each theme there will be sufficient flexibility to address both *Emerging needs* and *Unforeseen policy needs*
- Dissemination of knowledge and transfer of results will be supported in all thematic areas
- Support will be implemented across all themes through:

### **Collaborative research**

(Collaborative projects; Networks of Excellence; Coordination/support actions)

### **Joint Technology Initiatives**

### **Coordination of non-Community research programmes**

(ERA-NET; ERA-NET+; Article 169)

### **International Cooperation**



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# Principles of Life Cycle Thinking

- **Include whole life cycle of product or system** (avoid shifting-of-burdens among life cycle phases)
- **Relate impacts to quantified "functional unit" of the system** (avoid "comparison of apples with pears")
- **Consider all impacts** on the environment, human health, and resource availability (avoid shifting-of-burdens among impacts, safeguard subjects and countries)
- **Quantify impacts on absolute basis** (enable direct comparisons of options, also of very different systems that have same functional unit)

**LCT/LCA is a concept to bring different information into perspective !**

**LCA is complementary to other tools and information !**





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# Life Cycle Thinking in 2007 Work Programme

	No. topics
1. Health	0
2. Food, agriculture and biotechnology	4
3. Information and communication technologies	1
4. Nanosciences, nanotechnologies, materials and new production technologies	3
5. Energy	0
6. Environment (including climate change)	3
7. Transport (including aeronautics)	3
8. Socio-economic sciences and the humanities	0
9. Security	0
10. Space	0





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## Drivers

***“ .... the long term goal is for the EU to become a recycling society, organised around the maximum recovery of materials where this makes environmental and economic sense, and energy recovery where this is more efficient”***

- ✧ Lisbon Agenda
- ✧ Stern Report
- ✧ IPPC Report
- ✧ Lead Market Initiative
- ✧ Greening of Industrial Policies
- ✧ Environmental Technologies Action Plan (ETAP)
- ✧ Revision of the EMAS and Eco-Label Regulations
- ✧ Green Public Procurement (GPP)
- ✧ Sustainable Consumption and Production Action Plan (SCP)

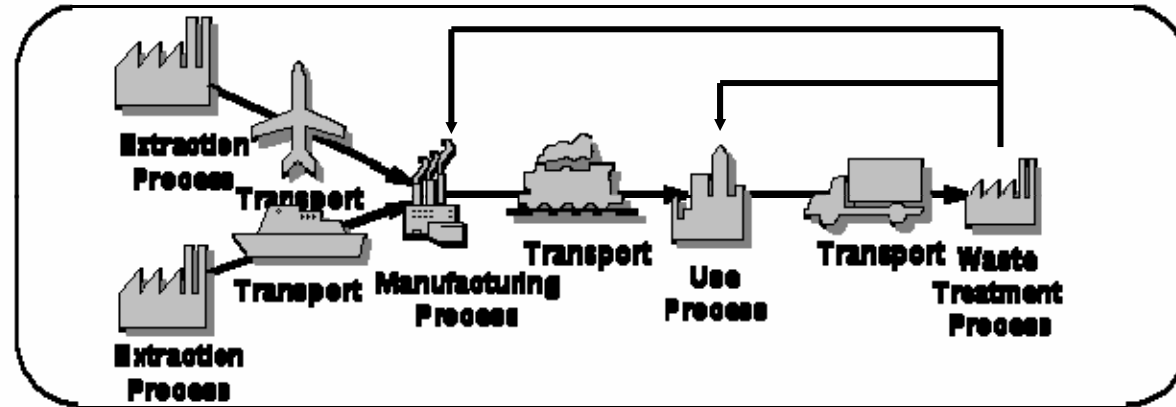




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# Life Cycle Thinking



Core Theme in:

- Waste Framework Directive – Revision (2009 ?)
- Strategy for Prevention and Recycling of Waste (2005)
- Strategy for Sustainable Use of Natural Resources (2005)
- Energy using Products Directive (2005)
- Environmental Technology Action Plan (2004)
- Integrated Product Policy Communication (2003)

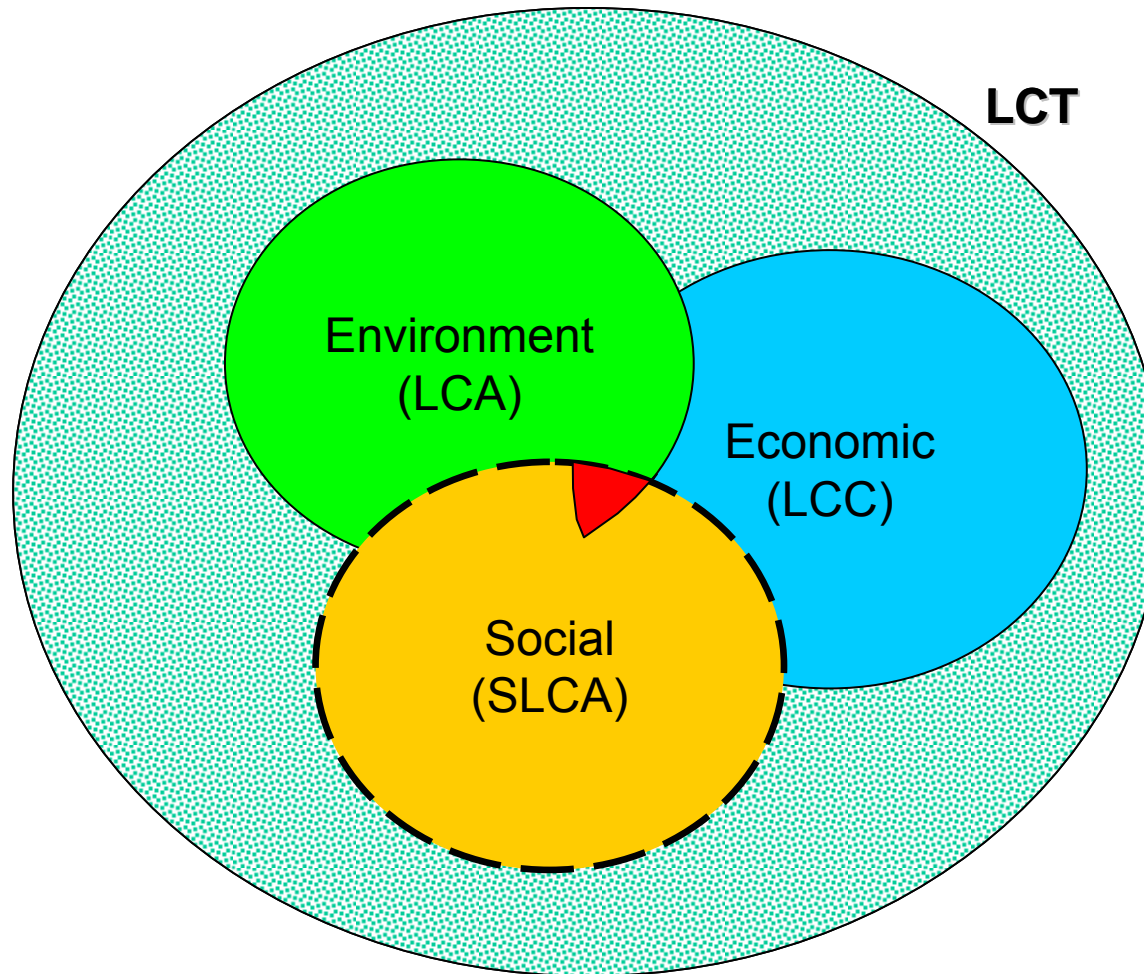




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# Life Cycle Thinking for Sustainability: Soft-links vs. Hard-links



COOPERATION



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# CALCAS

## FP6 Coordination Action

<b>Consortium:</b>	13 Partners
<b>Duration:</b>	30 months, starting 1/9/2006
<b>Budget:</b>	1,4 Million Euro

- Broad and deeper LCA Methodology - from LCA to LCS?
- Governance and LCA
- User needs
- LCT and Waste
- LCT and Technology Assessment





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## Life Cycle Thinking in FP7

Within the first calls of FP7, most of the **waste-technologies research** projects will have also to provide (mandatory requirements):

- a ISO 14040 conform LCA,
- a LCC/externality study
- a Life Cycle Social Assessment study

The LCA studies shall be provided according to data format and quality requirements set up by the European Platform for LCA





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## The world (of LCA) is changing

- From retrospective to prospective assessments
- From single-product assessment to product categories
- From production to production & consumption
- From marginal figures to totals
- From “one pillar to the whole building”





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## The economic dimension

- ❖ Economic aspects (employment, GDP, etc)
- ❖ Economic mechanisms (like market mechanisms)
- ❖ Economic valuation of environmental impacts (like the valuation of health effects of toxic emissions in monetary terms – QALY)





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# Social Life Cycle Assessment

## Existing indicators:

- ✓ International Labour Organisation standards
- ✓ OECD guidelines for Multinational Enterprises
- ✓ Global Reporting Initiative
- ✓ SA 8000

**HOWEVER**, they are not developed for applications in LCA, but rather to monitor social aspects of individual sectors, governments and countries



**The development of standard set(s) of social indicators needs further elaboration and research !**





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# Environmental Technologies Action Plan (ETAP)

Environmental Technologies have the **potential** to reduce pressures on natural resources and contribute to EU competitiveness and growth (the Lisbon process)

“ Effective action on the scale required to tackle climate change requires a **widespread shift to new or improved technology** in key sectors such as power generation, transport and energy use ” *(the Stern Report)*

- potential is **not fully used** – and EU action is needed
- fields of action:
  - getting from **research** to markets
  - **improving market** conditions
  - acting globally





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## The big issue

Which information do we have to provide to support  
“society” path towards sustainability ?

- ✓ Any technology, once fully implemented, will cause more or less large effects on society (in terms of positive/negative environmental, economic and social impacts)
- ✓ How do specific technologies compare in terms of sustainability performance?
- ✓ How do alternative options for technologies in a domain compare in terms of sustainability performance?





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## Potential benefits of a Sustainability Assessment of Technologies (SAT) method

The potential *benefits* of a common framework for *ex-ante* technology assessment:

- Identification of opportunities, new markets and new customers
- Anticipation of technologies risks (avoid negative impacts on company reputation, identify real or perceived vulnerabilities, minimising risk to develop the "wrong" technology, lower long term risks)
- More successful technology innovation (holistic view, better understanding of consumers' requirements, long-term consumer needs and societal changes)
- Proactive response to more demanding legislation and external technology assessments and ratings/labeling.
- Policy-making decisions supported by commonly agreed and transparently derived indicators





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## Final remarks

Independence is a principle of sustainable development, which aims at **balancing** environmental, economic, and social considerations.

Tendencies to methodologically **integrate** all impacts and benefits into a "single pot" could be counterproductive.

The use of similar boundaries and functional units in LCA, LCC, and Social LCA should help to improve their results in terms of computability and comparability





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## Conclusions and challenges ahead\*

- **Growing role** of Life Cycle Thinking in EU policy
- Working on the **foundation** – product **priorities**, data, indicators
- Product performance as a **driver** for **innovation** and benefit business **competitiveness**.
- Opportunities to some key elements e.g. **product information**
- SCP Action Plan, improving **synergies** -> concrete priority **actions**
- Addressing the **demand side** and lifestyles remains a challenge
- Involving key **stakeholders**: governments, businesses, local authorities, NGOs, trade unions, academia... win-win partnership
- Support the development of **regional** life cycle hub working in synergy with the European Platform for LCA

\* **Disclaimer**: must not be regarded as stating an official position of the European Commission





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***Thank you for your attention!***

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# Back up Slides





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## Some “perceived” limits of LCA

**Life Cycle data**

Availability



European Platform on  
Life Cycle Assessment

Quality



**Impact Assessment**

- *Local effects*
- *Global effects*
- *Health & Safety*





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# Social Life Cycle Assessment

**Product-related** social aspects are largely of three types:

- Particularly severe positive or negative effects (hotspots) at **upstream chains** (child labour, wages below subsistence level, etc)
- Utility aspects and impacts **upon consumers**
- Indirect effects of product use of **upon society**, such as changes in society caused by cars or mobile phones

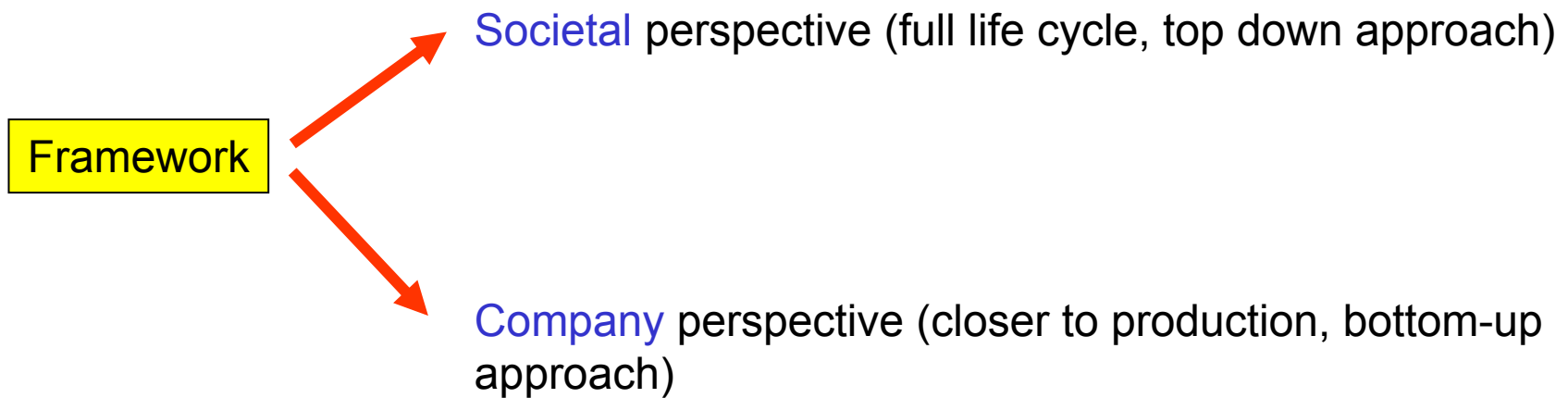




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# Social Life Cycle Assessment





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## Communication of external cost estimates

Semi-quantitative representation:

- 'best estimates' for quantifiable impacts
- 'traffic light' scheme for non-quantifiable impacts
  - no significant effects (assuming operation of facility according to good practice)
  - non-negligible effects are expected, leading to potential externalities
  - potential for significant effects, leading to potential conflicts with sustainability requirements

[Source: Krewitt 2007]





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## LCA issues open for further research

- Data quality and availability
- LCA in foresight assessments
- Dynamic vs Static LCA
- Site specific vs Site independent LCA
- Time specific LCA
- Risk-based LCA
- Rebound effects
- Economic and Social aspects
- ...

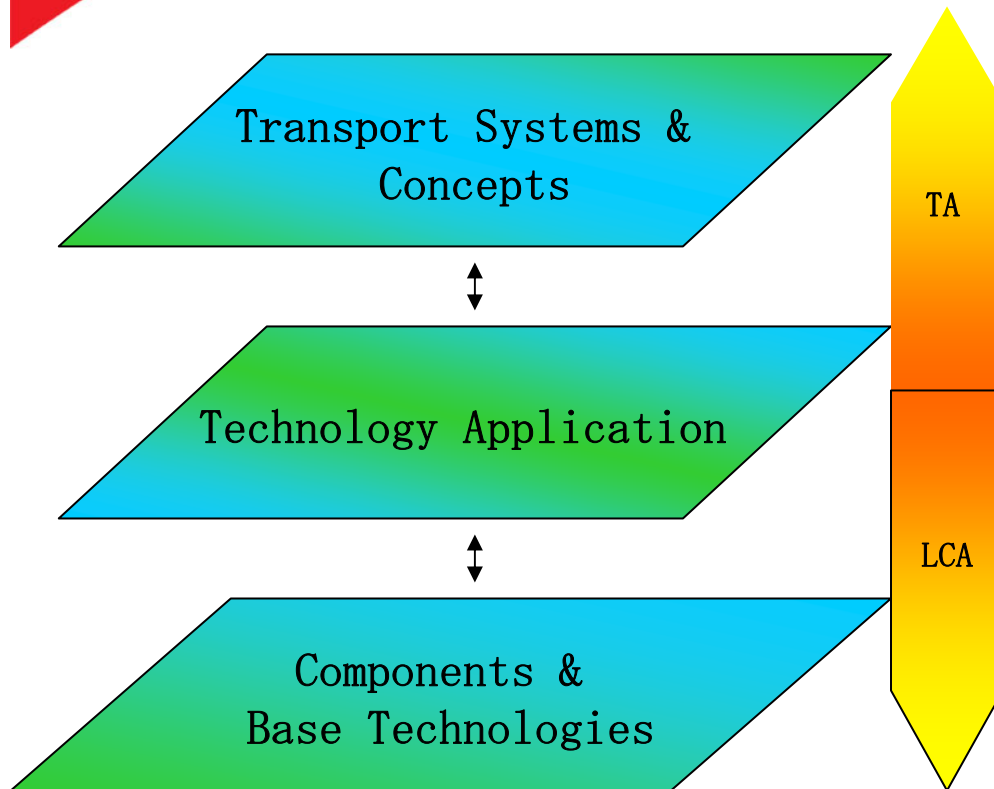




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## Levels of Technology



### Technology Driven TA:

New technology is considered as a potential solution for a problem

→ Potential effects of the technology and alternatives must be assessed





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## A possible approach to SAT: Sustainability Learning Curves

1. Identify technology hot-spots and key environmental, economic and social parameters
2. Parametric models
3. Technological improvement – experience, forecasts, and modelling
4. Technology diffusion scenario
  - Exogenous variable, possibly based on economic learning curves
5. → Sustainability learning curve
  - *Specific impacts vs. cumulative installed capacity*





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# Jargon: Cooperation

**Theme (6.)**



**Activity (6.3.)**



**Sub-Activity (6.3.3.)**



**Area (6.3.3.1.)**



**Topic (6.3.3.1.1.)**

The 10 chapters of the SP  
e.g. Environment (including CC)

Where a Theme has major  
segments  
e.g. Environmental Technologies

Major Blocks of an Activity  
e.g. Technology assessment

Part of a Sub-activity with a number  
of distinct research topics  
e.g. Risk Assessment of Chemicals

The level of a proposal  
e.g. in-silico techniques



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