European Trends in Low-carbon Economy Research – an Analysis of Europe-wide Research Topics, Projects and Networks

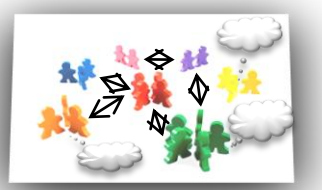
Andreas Endl,
André Martinuzzi

Content of this presentation

background, scope, methodology

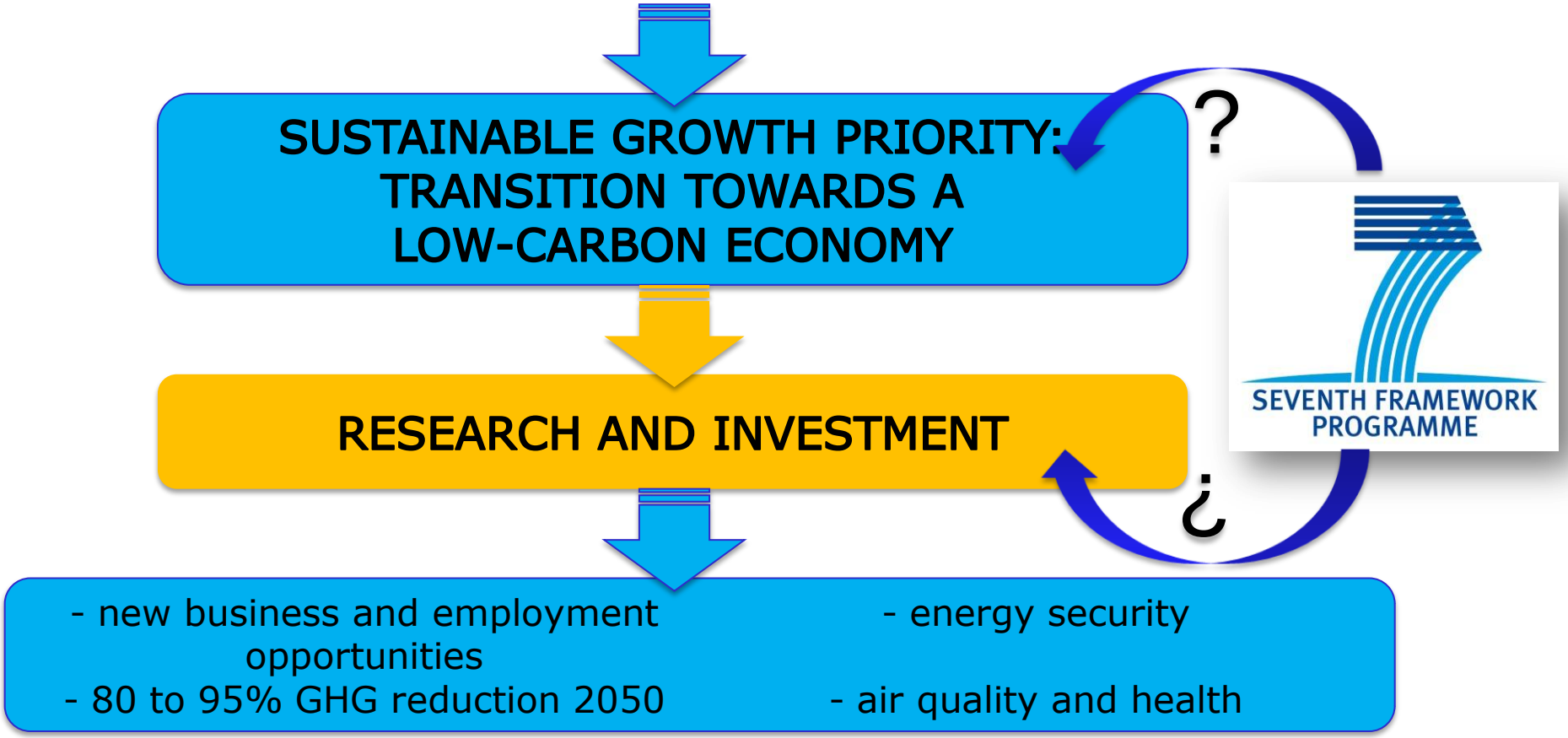
1. **What is the contribution of European research towards the transition of a low-carbon economy?**
2. **Which are the centres of excellence in low-carbon economy research in Europe?**
3. **What kind of research collaboration patterns exist within the low-carbon economy research community?**

Conclusions and recommendations



Context and EU policy background

- **2008: Global financial crisis and the impacts on Europe**
- **New EU policy agenda: Europe 2020 Strategy**



7th Framework Programme for Research and Technological Development

- **EU's main programme for funding research across Europe**
- **duration: 2007-2013**
- **total budget: € 53 billion**
- **Aim: jobs, competitiveness, knowledge economy**
- **Projects: technological development and demonstration**
- **participants from different European (and other) countries**

SEVENTH FRAMEWORK PROGRAMME

7th Framework Programme: Structure

Cooperation

- Health
- Food, agriculture, fisheries and biotechnologies
- Information and communication technologies
- Nanosciences, materials and production technologies
- Energy
- Environment (incl. climate change)
- Transport (incl. aeronautics)
- Socio-economic sciences and humanities
- Space
- Security

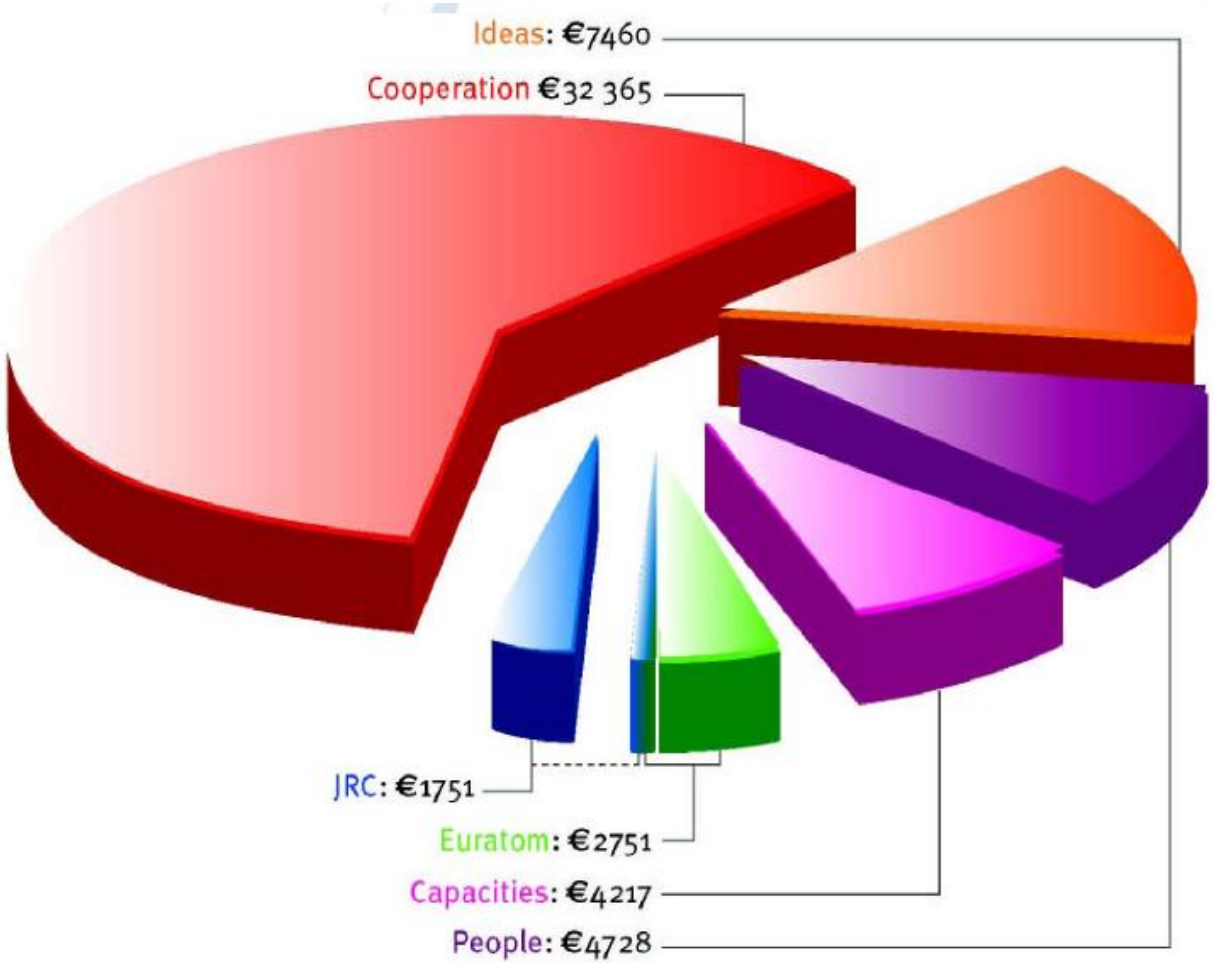
People

Euratom

JRC

SEVENTH FRAMEWORK PROGRAMME

FP7 Budget (€ million)



SEVENTH FRAMEWORK PROGRAMME

Methodology

Monitoring System: FP7-4-SD.EU

- **Accountability**
- **Transparency**
- **Steering effect**

LCE framework - Identify LCE research

Quantitative structural analysis

Social Network Analysis

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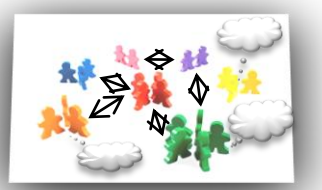

1. What is the contribution of European research towards the transition of a low-carbon economy?

Methodology

FP7

+

EU SDS

=

Monitoring

- main instrument for funding research in Europe between 2007 and 2013
- contributes to the renewed European Sustainable Development Strategy (EU SDS)

- basis for how the EU will meet the challenges of sustainable development
- importance of investing in science and technology
- need for an effective review system

1. What is the contribution of European research towards the transition of a low-carbon economy?

Methodology

Climate change and clean energy	• Reducing GHG emissions • Raising the share of renewables
Sustainable transport	• Reducing transport greenhouse gas emissions • Reducing transport noise
Sustainable consumption and production	• Improving the envir. performance for products • Raising the level of Green Public Procurement
Conservation and mgt. of natural resources	• Improving management of renew. nat. resources • Halting the loss of biodiversity
Public health	• Improving food and feed legislation (incl. labelling) • Curbing the increase in chronic diseases
Social inclusion, demography and migration	• Reducing child poverty • Reducing early school leaving
Global poverty & sustainable development challenges	• Contributing to achieve the MDGs • Increasing the effectiveness of aid policies

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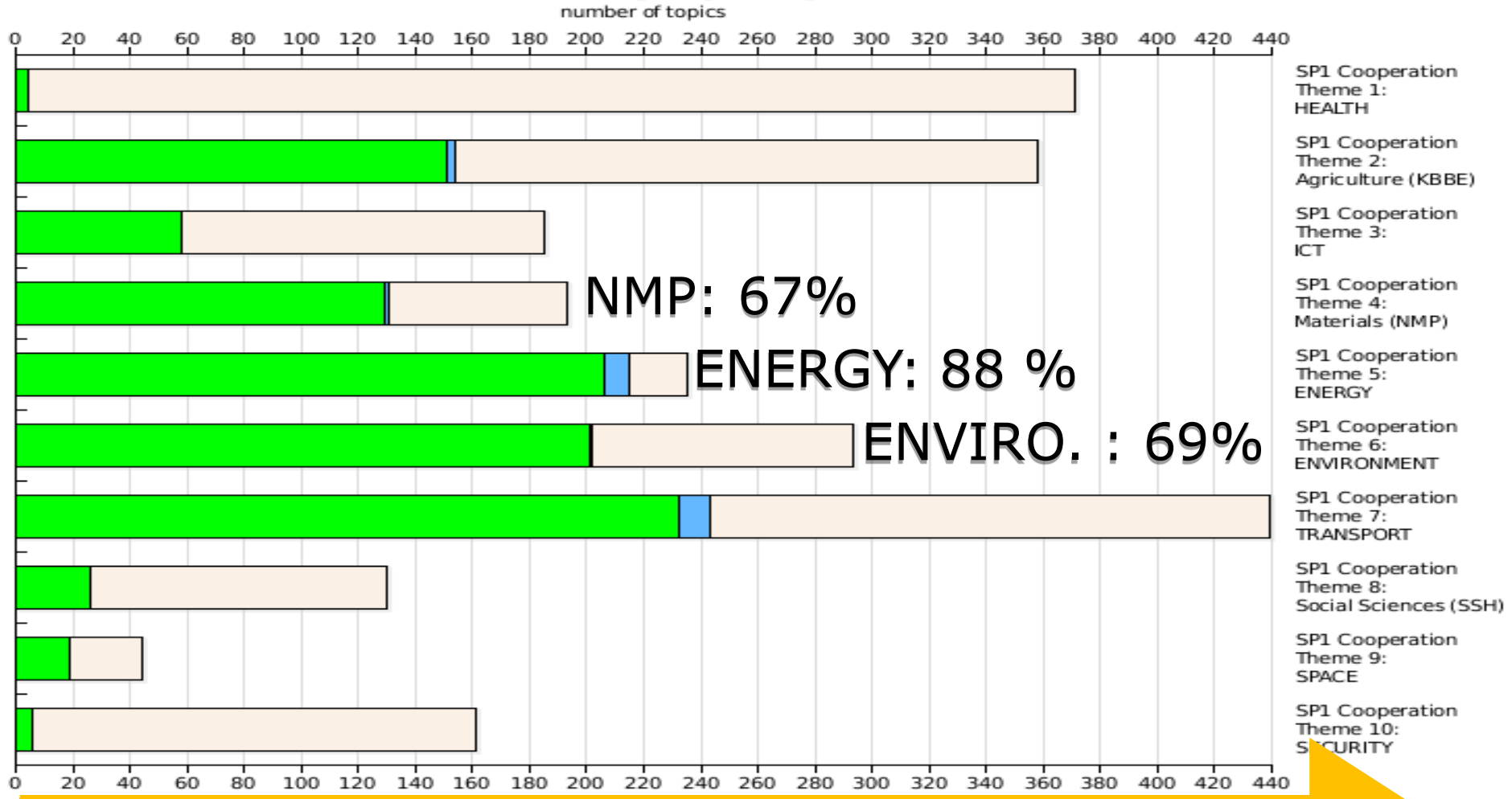
1. What is the contribution of European research towards the transition of a low-carbon economy?

Key findings

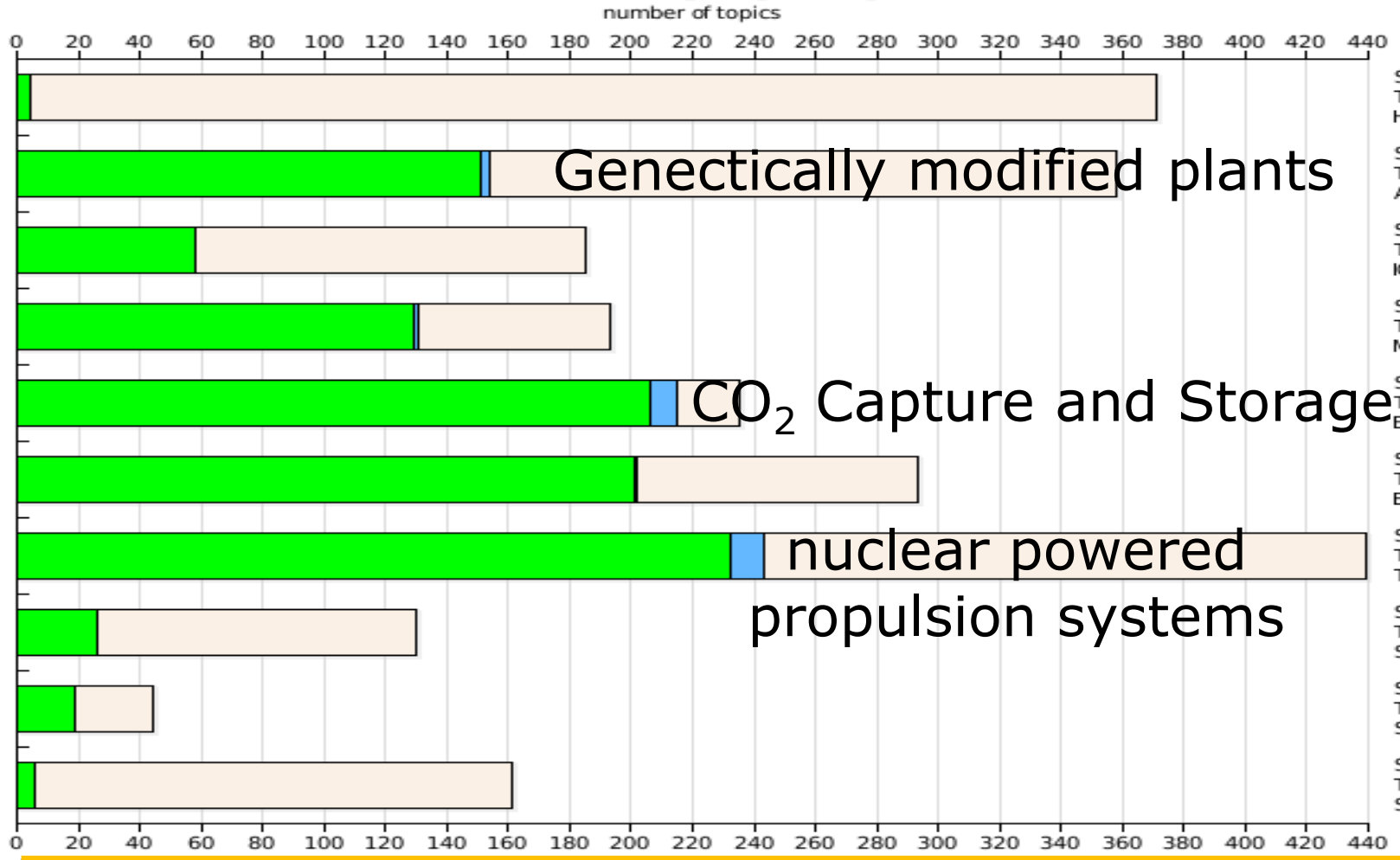
> one third of FP7 research	= 1125 research projects
> 40% of EU co-financing	€ 4.3 billion out of € 10.5 billion
Leaders: DE, UK, FR, IT	> 200 coordinated projects
> 6000 organisations	Mainly private for profit organisations

Contribution of themes (topics) I



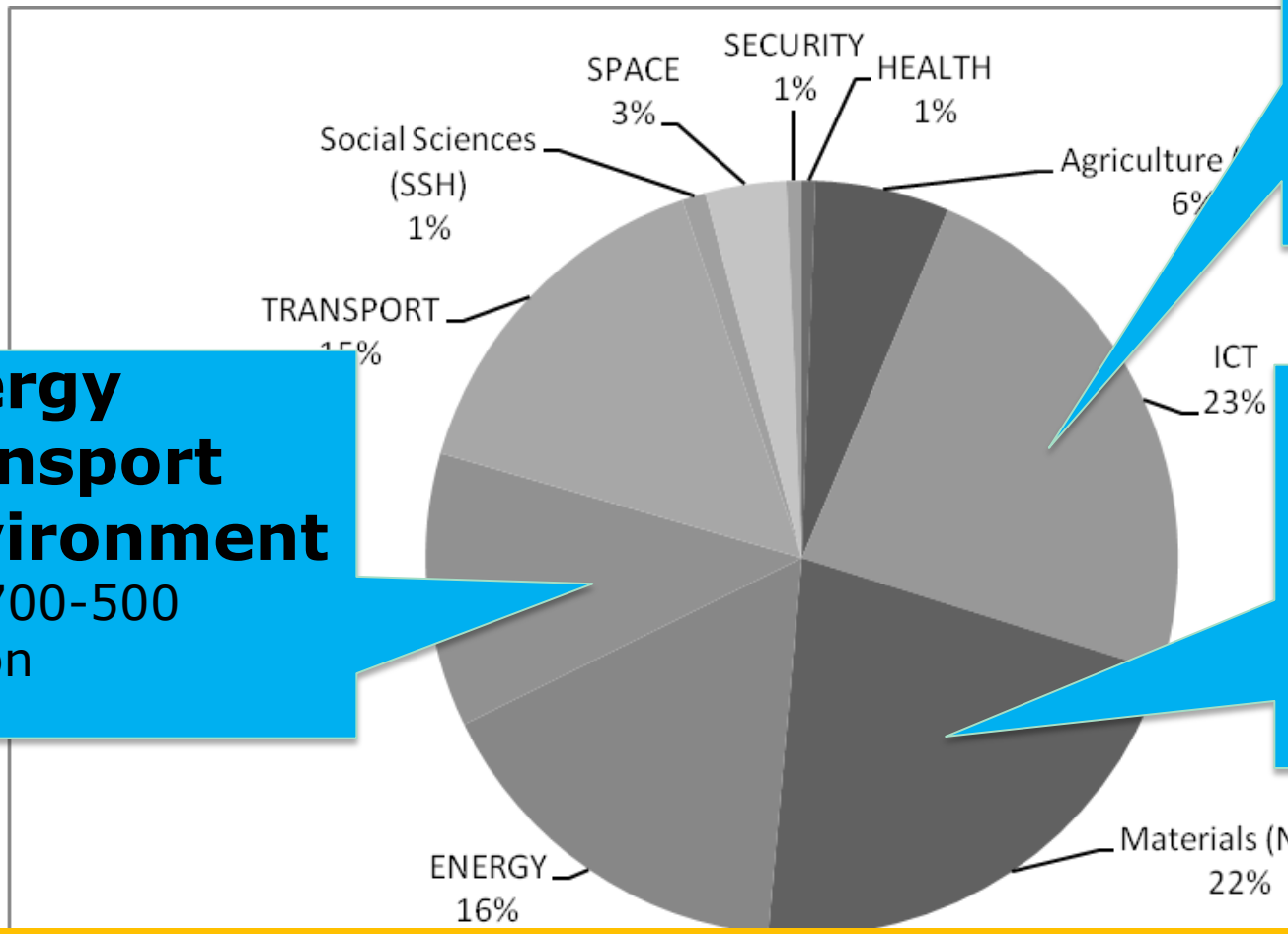
Thematic focus predetermines impact

Contribution of themes (topics) II



Controversial aspects remain

EU co-financing addressing LCE



ICT
- € 1 billion
- almost one quarter

Energy
Transport
Environment
- € 700-500 million

NMP
- € 920 million
- almost one quarter

Funding Focus: ICT, new materials and nanomaterials

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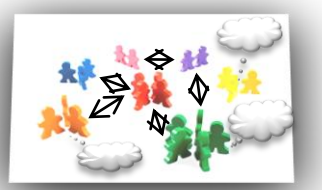
3. What kind of research collaboration patterns exist within the low-carbon economy research community?



Conclusions and recommendations

2. Which are the centres of excellence in low-carbon economy research in Europe?

Methodology

Centres of excellence:

- organisations coordinating research projects
- exceptional scientific knowledge base and essential coordination skills

Focus on LCE aspects:

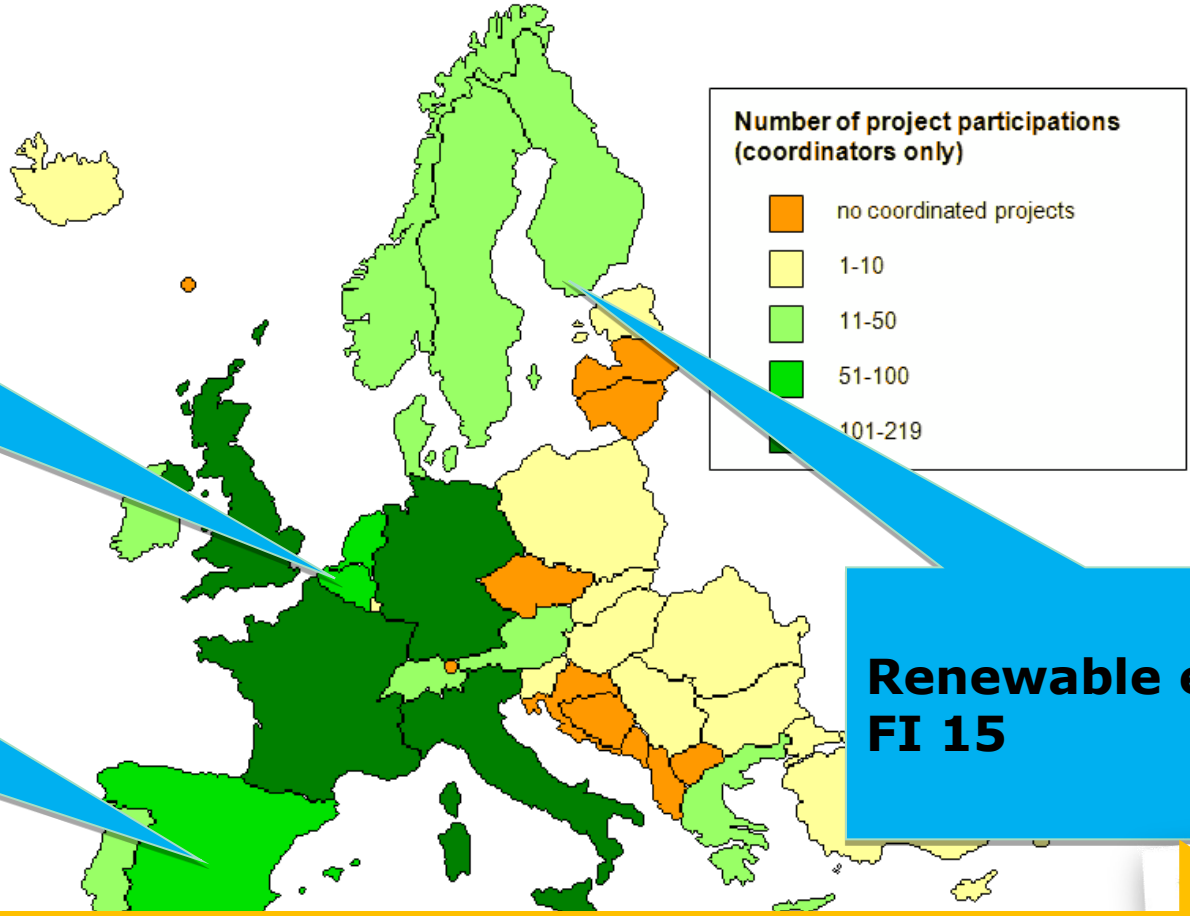
- Renewable energy
- Energy efficiency
- Low-carbon transport

2. Which are the centres of excellence in low-carbon economy research in Europe?

Key findings

Low-carbon Transport
BE 22

Energy Efficiency
ES 30
BE 29



Renewable energy
FI 15

Thematic focus varies across EU Member States

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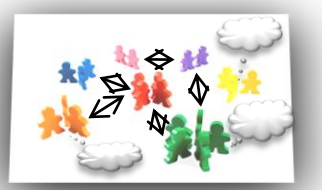


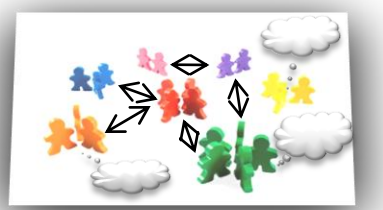
Conclusions and recommendations

What kind of research collaboration patterns exist within the low-carbon economy research community?

Methodology

Social Network Analysis

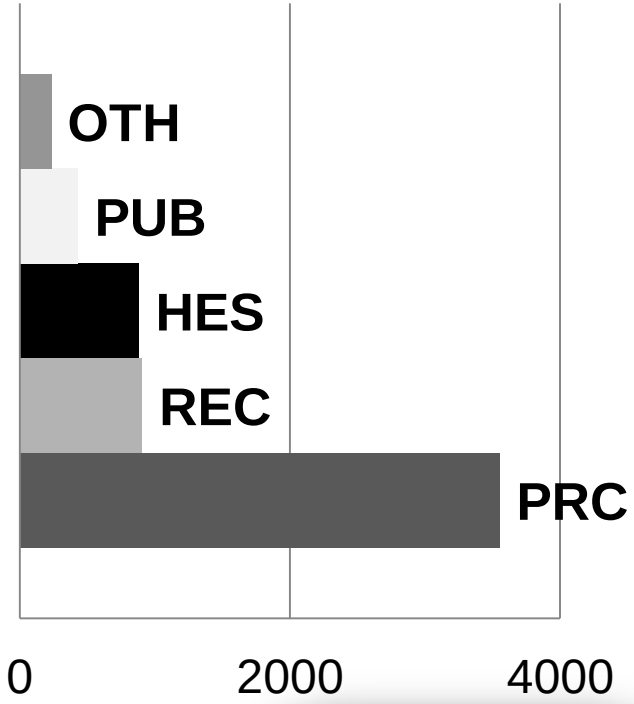
- Software: Pajek
- Focus: Organisation type
- Core of the network
- Knowledge brokerage

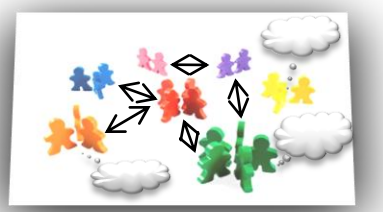


What kind of research collaboration patterns exist within the low-carbon economy research community?

Key findings

- Over 6000 organisations
- 1-64 participants per project (average: 16)
- Organisation type:
  - Research organisation (REC)
  - Higher or secundary education institution (HEC)
  - Private for profit organisation (PRC)
  - Public organisation (PUB)
  - Other institution (OTH)





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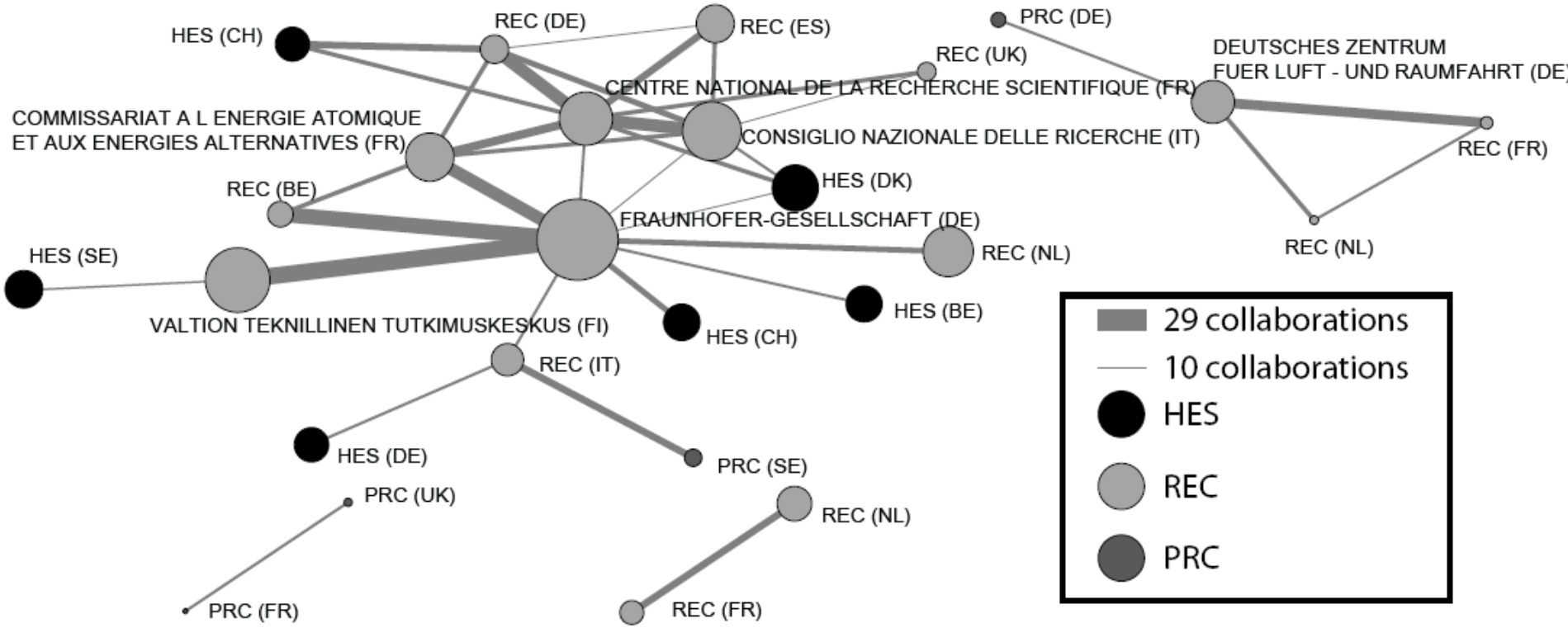
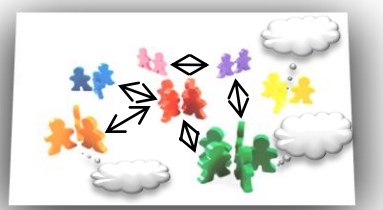




Unique items for final conclusions

1. **Tool for institutional learning**
2. **LCE is an intrinsic part of FP7**
3. **High degree of company involvement**
4. **backbone of the network: research organisations**

Recommendations

Further Research

- **Project level**

  → **technological focus**

  → **ex-post societal impacts**

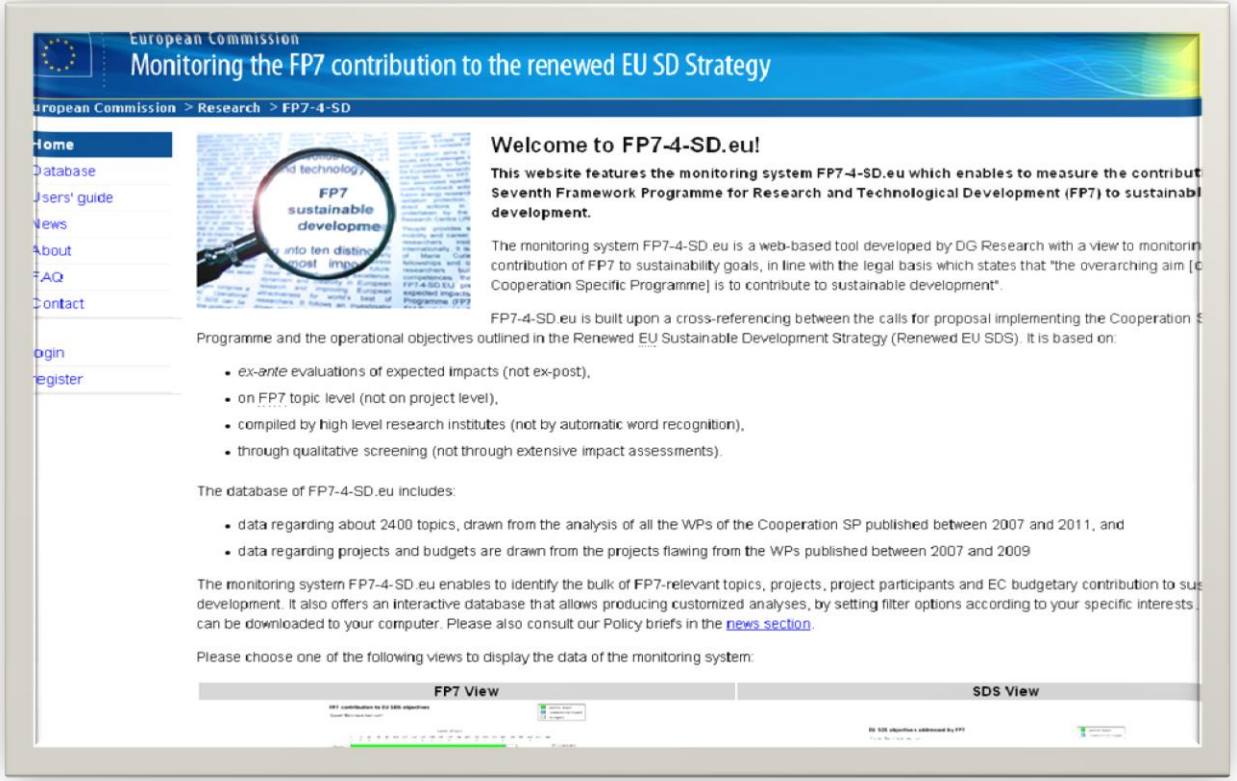
- **Policy level**

  → **Implementation gap: Measures for dessimination**

  → **Miss-match: technological focus - dessimination**

Thank you for your attention

Andreas Endl, André Martinuzzi
RIMAS – Research Institute for Managing Sustainability
WU – Vienna University of Business and Economics

Visit our project Website:

www.fp7-4-sd.eu/