NSR Future Cafe

Climate Change - New Research Agenda

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Challenges

Climate change mitigation and adaptation requires

1. Holistic approach - buildings, infrastructure, transport

2. Resilient infrastructure

3. Intelligent Integrated Systems – Sharing Information

We need 3 types of Research and Demonstrators

- Technological

- New business and financial models

- Community-led innovation.

About the Institute for Sustainability

- An independent charity, led by a world class board representing UK industry, academia and the public sector

- Set up to accelerate the delivery of sustainable cities and communities

- We work closely with partners to drive innovative and collaborative demonstration projects; and

- Share the learning from these and other projects to identify best practice, encourage investment and to actively support social and economic development.

Institute EU projects

- INTERREG

  - **iTransfer, LoPinoD ,GSA** (NSR)

  - **Weastflows**; Cradle to Cradle (NWE)

- EIT

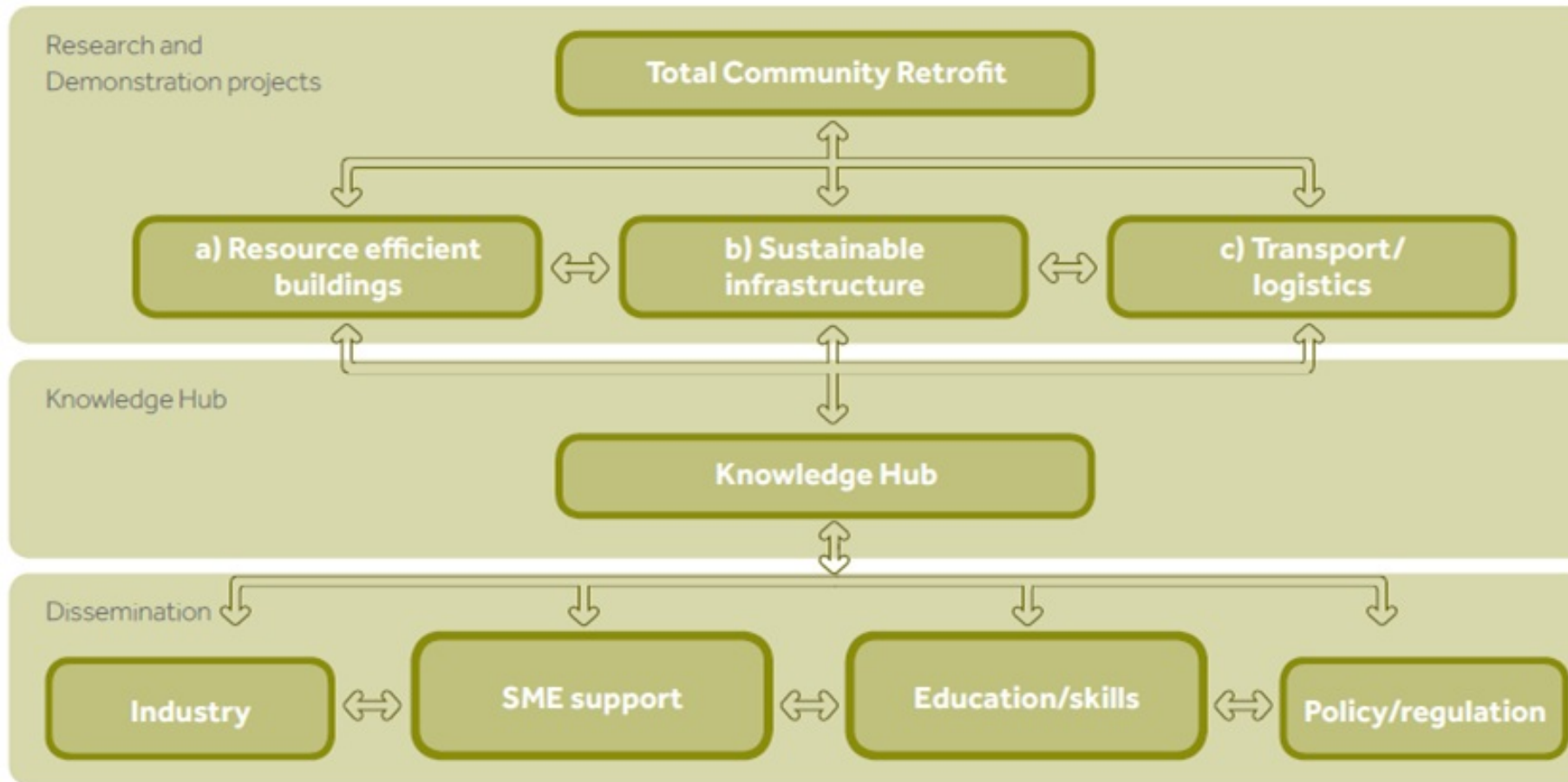 - Climate Change - Knowledge and Innovation Community (Core Partner)

- FP7

  - TURAS (Dublin lead); GeoClusters (Energy Efficient Buildings); Open House.

- ERDF Competitiveness

  - FLASH; FLASH+; iCAD

Institute core activity

Total Community Retrofit:
Demonstrating 2050 in 2015

Integrated and resilient infrastructure

- "For the economy to flourish, people, goods and information must move freely. Businesses across all regions and industries need the right conditions to grow. Reliable infrastructure: energy, water, transport, digital communications and waste disposal networks and facilities, are essential to achieve this. **Ensuring these networks are integrated and resilient is vital**. Failure to make the right choices at the right time, or pausing investment, risks not only growth but also the UK's international competitiveness."
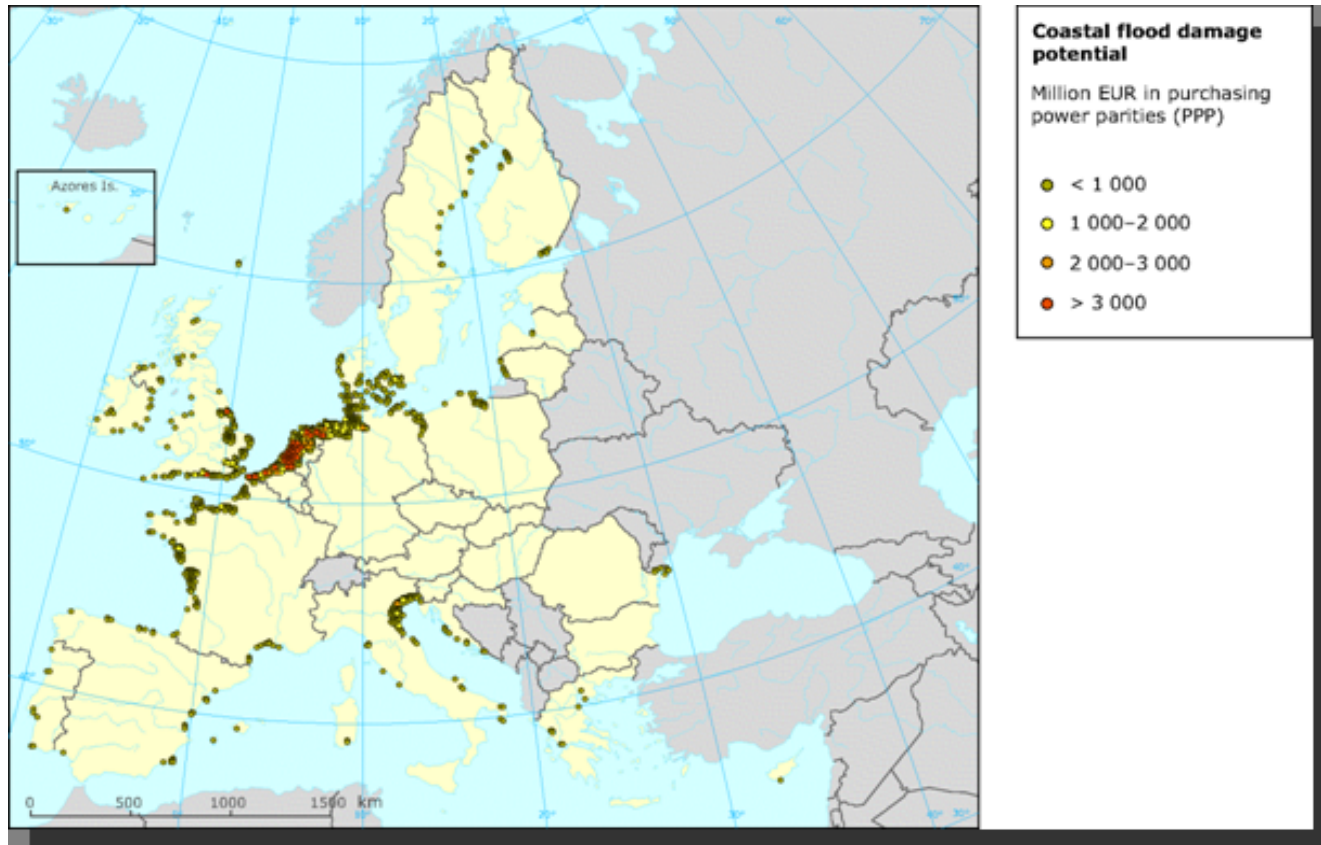
(National Infrastructure Plan, UK 2010)

- Infrastructure networks are neither integrated nor resilient

Some Resilience Challenges

- **Material**s supplies - global shortages / localised sources :- rare earths, phosphorus

- **Transport** exemplifies a lack of integration and resilience, with fragmented governance - disconnect across Government Departments; between modes (road, rail, air and maritime); and between passenger and freight sectors

- Recent events highlight instability and fragmented approach:

  - ➢ Fuel protests in 2000 – shops running low after less than 1 week
  - ➢ Icelandic volcano – airlines crippled, no backup plan for other modes
  - ➢ Snow – large parts of UK brought to standstill
  - ➢ Cross-Channel – Operation Stack remains a regular occurrence

Damage potential of coastal flooding in Europe

Coastal flood damage potential

Million EUR in purchasing power parities (PPP)

- < 1 000
- 1 000–2 000
- 2 000–3 000
- > 3 000

Water Resilience

- Sea level - 1 - 1.5m projected global average rise 1990-2100.

- Acidity (carbon dioxide absorption decreases pH) and salinity changes will affect fish stocks (already noticeable in the Mediterranean).

- Changes in weather patterns creating drought and heat islands in some regions.

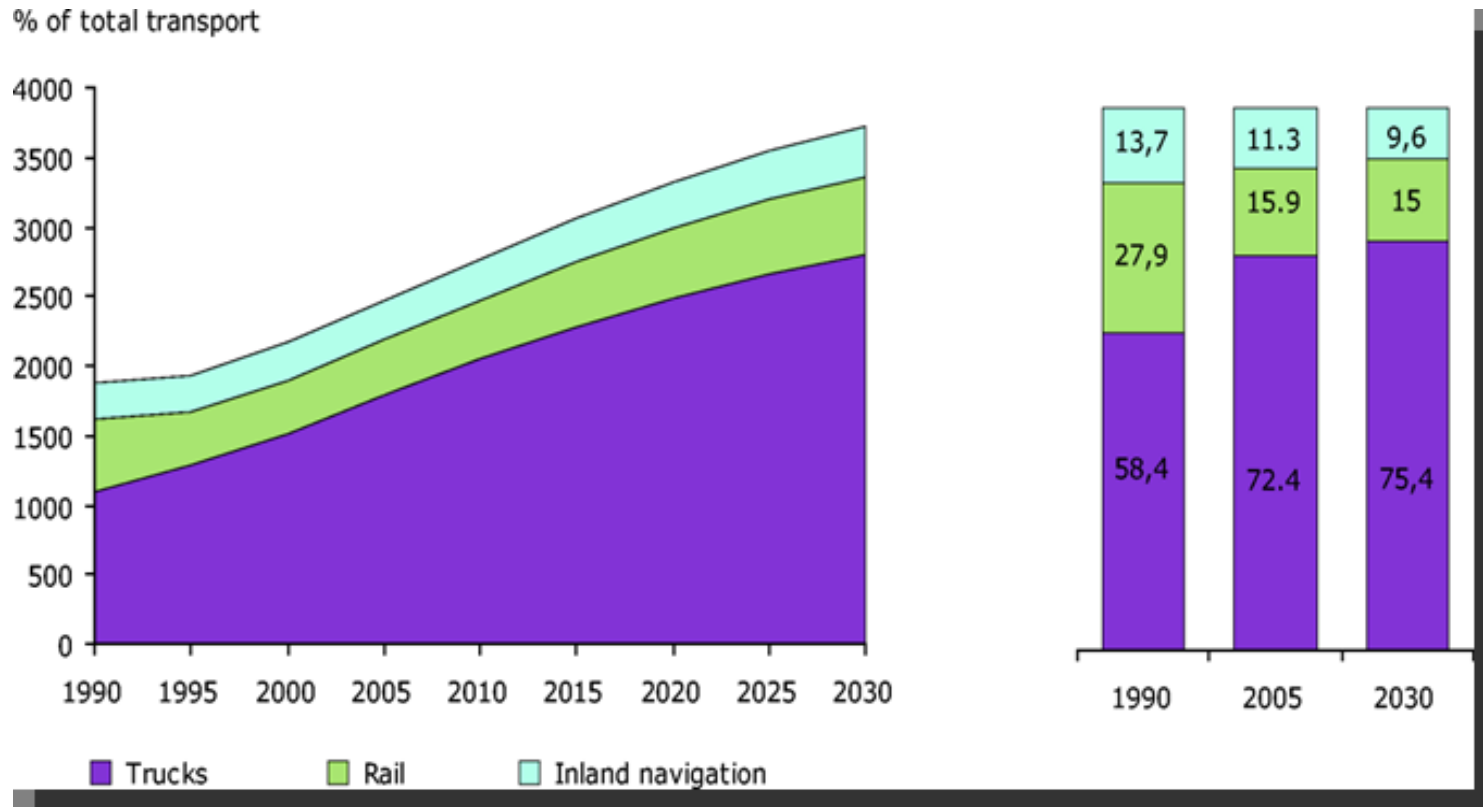- Energy costs for purification and pumping

EU White Paper – Road Map to a Single European Transport System

Ten goals cover sustainable fuels and propulsion systems; transport information and management systems and optimising multi-modal logistic chains, including
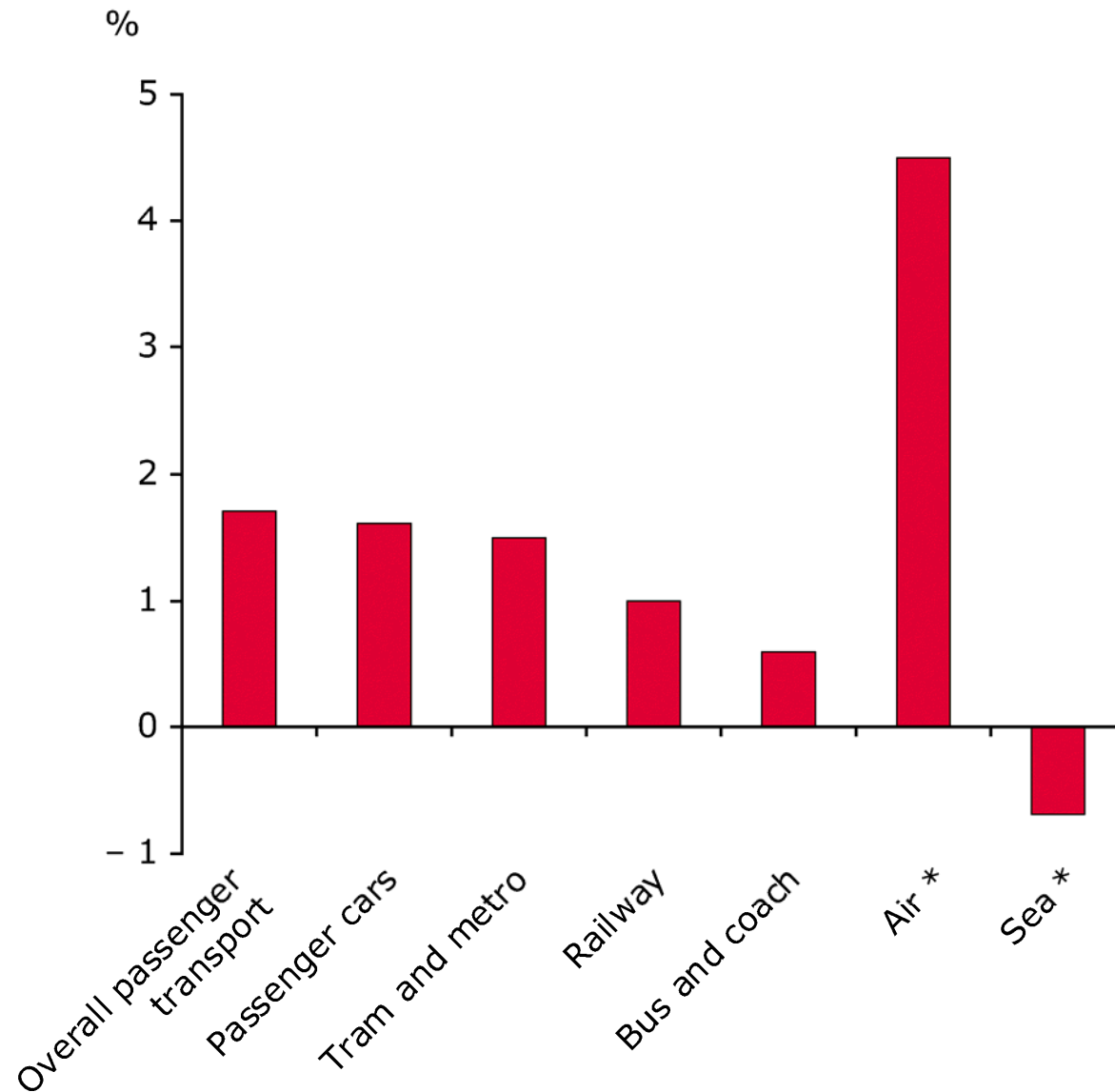
- Modal shift of road freight over 300km – 30% by 2030 and more than 50% by 2050 facilitated by efficient and green freight corridors. To meet this goal will also require appropriate infrastructure to be developed.

- By 2020 establish the framework for a European multi-modal transport information management and payment information systems.

40 initiatives - all see Transport as independent – no holistic thinking.

Modal split of freight transport in EU 27, 1990-2030

% of total transport

Legend: Trucks, Rail, Inland navigation

Bar chart values:
- 1990: 13,7 (Inland navigation), 27,9 (Rail), 58,4 (Trucks)
- 2005: 11.3 (Inland navigation), 15.9 (Rail), 72.4 (Trucks)
- 2030: 9,6 (Inland navigation), 15 (Rail), 75,4 (Trucks)

Average annual growth rates for passenger transport, EU-27, 1995-2007

Thinking globally – acting locally

Systems thinking: There is no Waste only Resource (C2C)

- Local low carbon and upcycling supply chains

- Local manufacturing / adding value

People and communities:

- Learn to Trust (tear down the Wall)

- Overcome inertia in Institutional responses

- Ownership - new social enterprise models

- Innovation drivers

Questions

1. Does climate change mitigation and adaptation requires research and demonstration in

- Holistic approach - buildings, infrastructure, transport

- Resilient infrastructure

- Intelligent Integrated Systems – Sharing Information

and are there models and good practice we can learn from?

2. We need R&D not just in Technology. What kind of learning do we need to do in

- New business models and social enterprises for sustainable development?

- Harnessing talent and creativity in Communities

Thank you

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