Recommendations for Follow-up

IPHE mission:

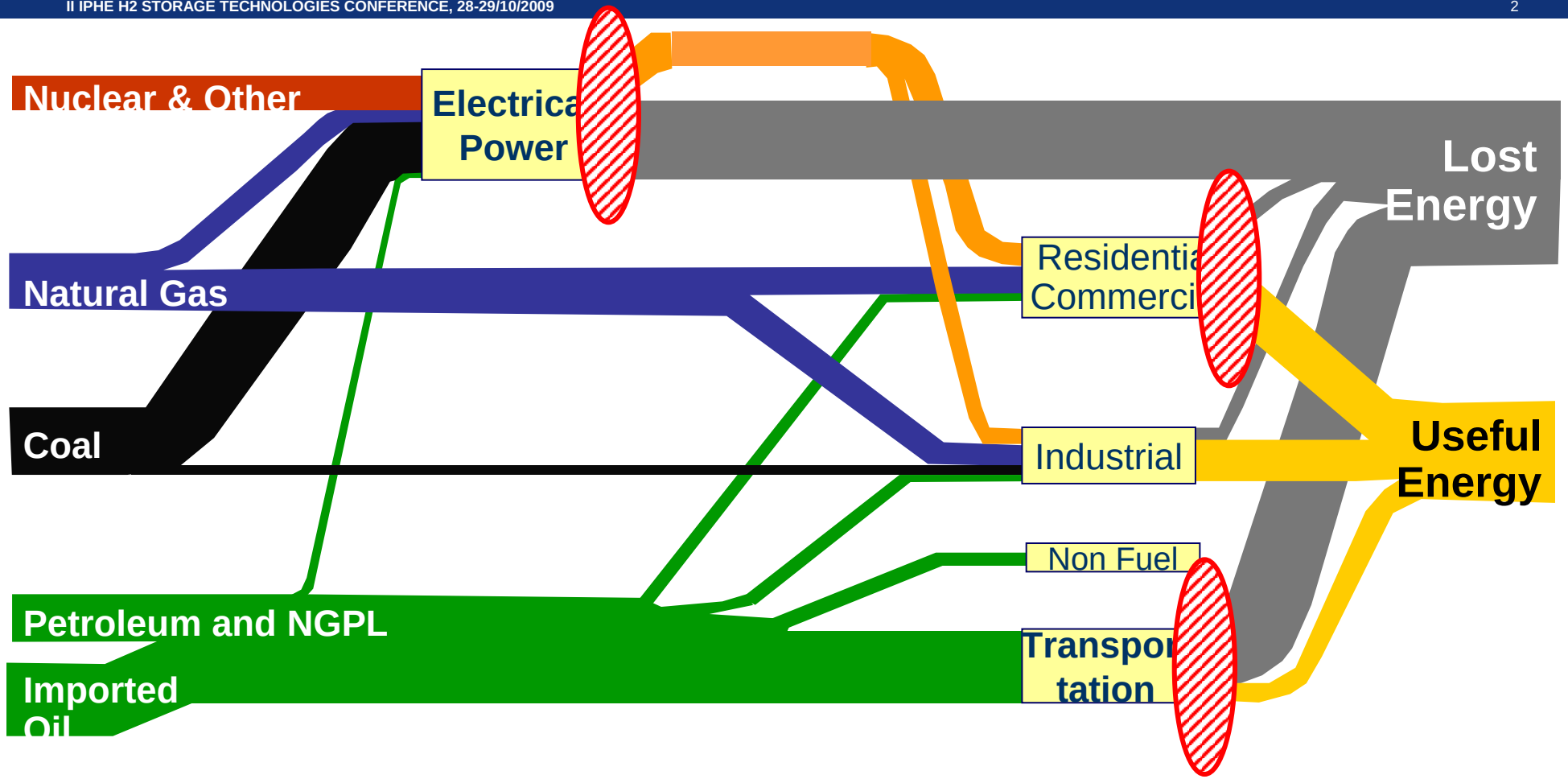
to <u>facilitate</u> collaborative R,D,D and commercial utilization of H2 and FC technologies

- leverage resources between IPHE members
- more effective use of government funding

<u>scope of international cooperation</u>

- communication and information sharing
- R, D, D in pre-competitive phase
- targetting issues with international dimension that affect deployment of H2&FC technologies (road-mapping, public awareness and acceptance, RCS, incentives, “competitive” technologies, ...
- mutual participation in programme assessment

Fuel Cell Potential in the Energy Chain



Adapted from Lawrence Livermore National Laboratory, 2003

Fuel cells should be used where

- they create the biggest efficiency gains, and thereby carbon reductions
- they contribute optimally to relieving the grid: stationary applications in distributed generation

Not all fuel cell types use exclusively hydrogen as a fuel

Key challenges for H2&FC and IPHE efforts

technological

- improvements in fuel cell durability, performance and economics
- on-board hydrogen storage systems for vehicles + stationary storage
- competitively-priced hydrogen (production & distribution costs)
- hydrogen from renewable sources
- mass production technologies for fuel cell stacks & systems

collaborative RDD funded through IPHE Member States' programmes (incl. EU FCH-JTI in future)

implemented within

- IPHE collaborative projects:
  NESSHY (HySIC), FCTESQA, …inter-lab testing
- IEA-HIA Task activities: 22, 19 (MoU)
- *IAEA (civil applications of neutrons)*

IPHE Conferences and Workshops

- HST-1,HST-2
- SSH
- ICHS 1-3
- FC degradation
- FC diagnostics
- FC accelerated testing

non-technological

- safety perception
- public awareness
- education and training
- regulations, codes and standards
- socio-economic aspects

IPHE working groups

H2&FC technologies, H2 safety curriculum, first responder training, ...

Key challenges for H2&FC and IPHE efforts

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- hydrogen from renewable sources
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- catalysis
- clarification of sorption mechanisms and kinetics
- heat management in metal hydrides
- high pressure electrolysers
- use of intermediate energy carriers
- engineering and system integration
- *nanotechnologies (wider than H2&FC)*

non-technological

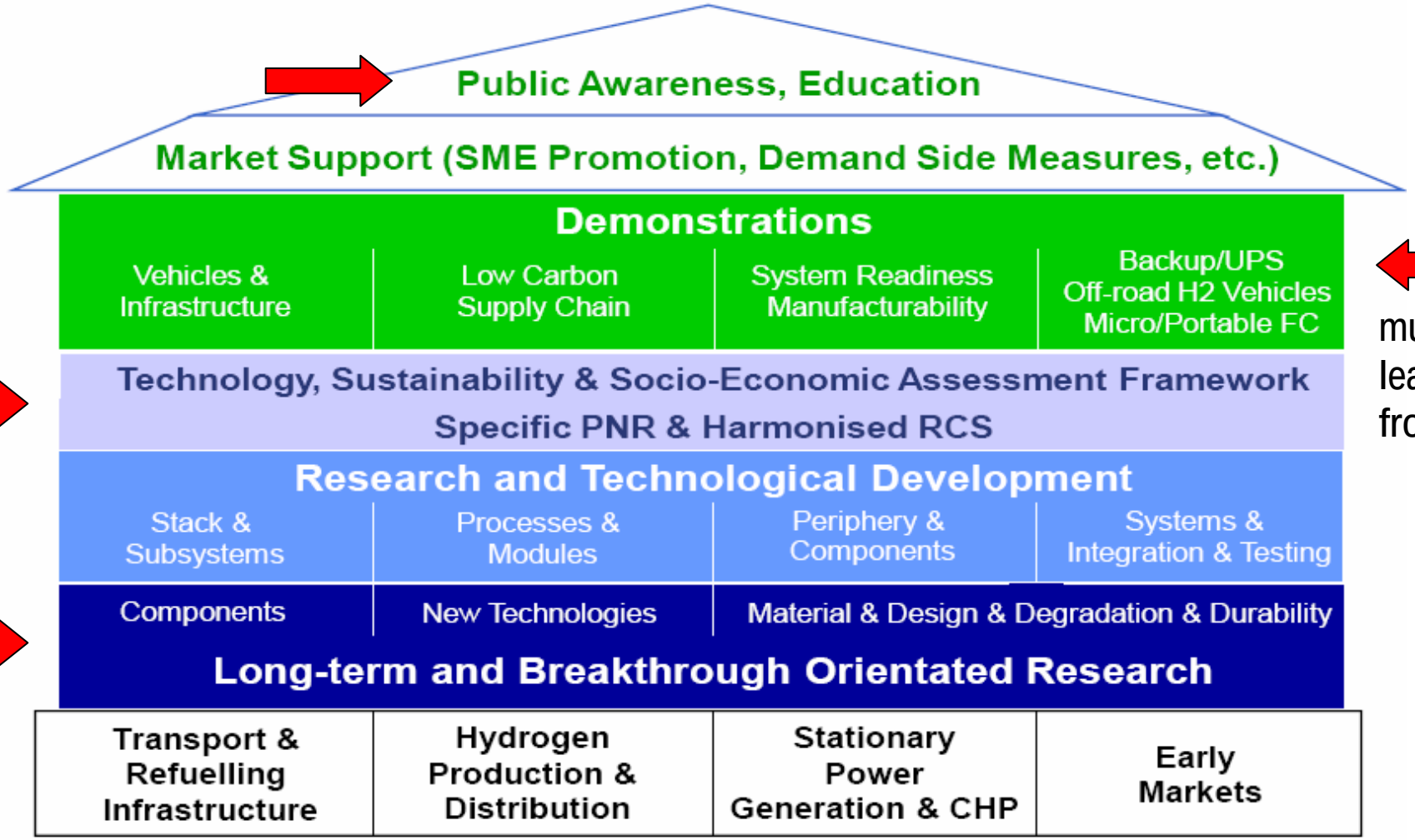
- safety perception
- public awareness
- education and training
- regulations, codes and standards
- socio-economic aspects

safety (IPHE priority)

- knowledge and information sharing
- access to large scale experimental facilities for validation purposes of model simulations

- exploitation of niche market opportunities, in particular to facilitate deployment in transport and stationary applications
  - forklifts, special vehicles
  - semi-stationary applications (marine, mine-locomotives, ...)
- learning from demonstration projects

IPHE contribution to FCH JTI



mutual learning from demos