energy technologies institute

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Multi-Vector Integration

Utility Week Live

Wednesday 24th May 2017

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ETI10 TEN YEARS OF INNOVATION 2007 – 2017

The UK energy system

- There are limited instances where multiple energy vectors are currently used in conjunction to satisfy energy requirements
- Future energy system development presents a number of interesting challenges and opportunities
  - Increased electrification places even more emphasis on balancing requirements
  - Greater demand variability and more intermittent generation can be detrimental to efficient asset utilisation
  - Is there a way to make use of existing assets to reduce investment requirements?
  - Does looking beyond single demands, supplies or networks allow for a more cost effective overall energy system?

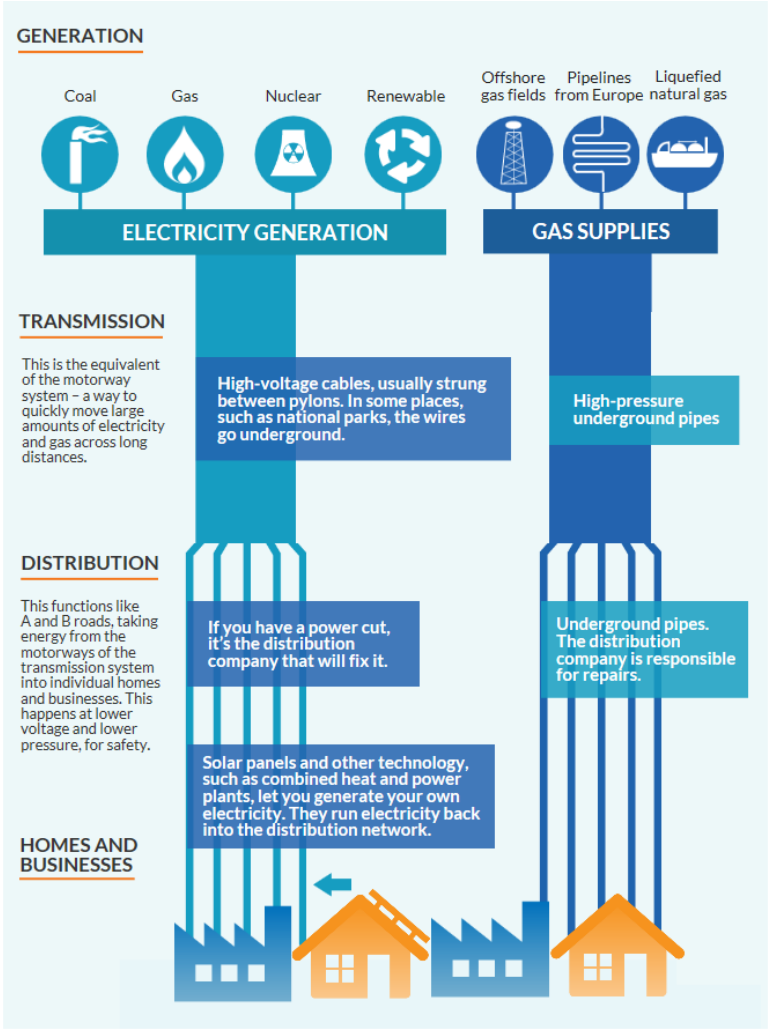
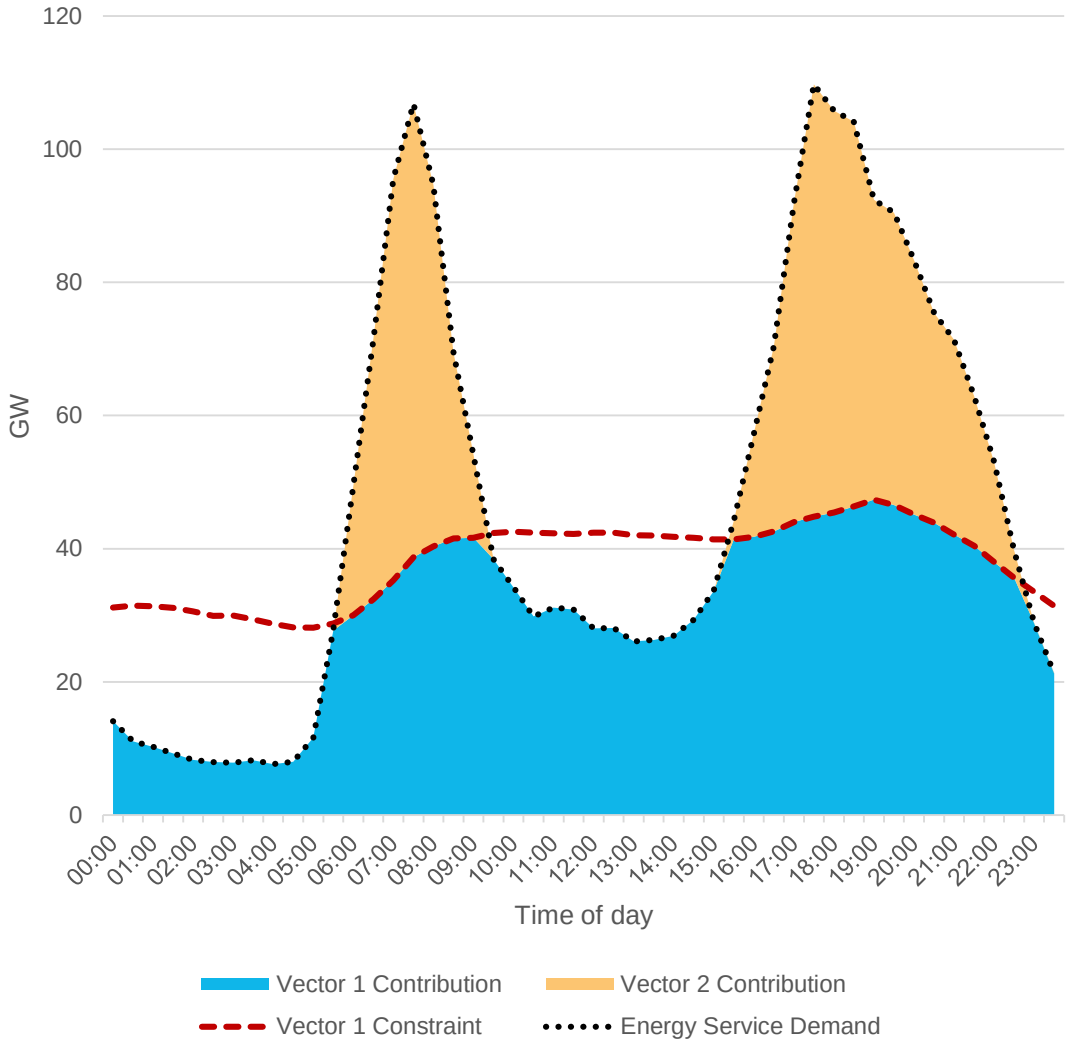


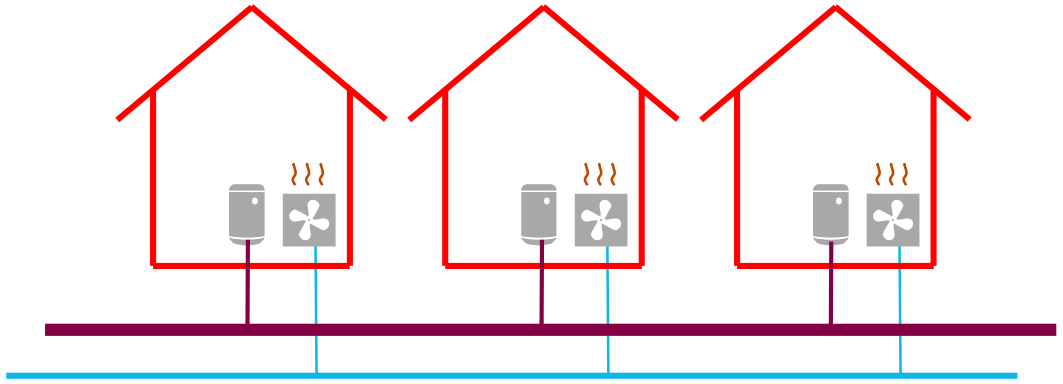
Image courtesy of Ofgem

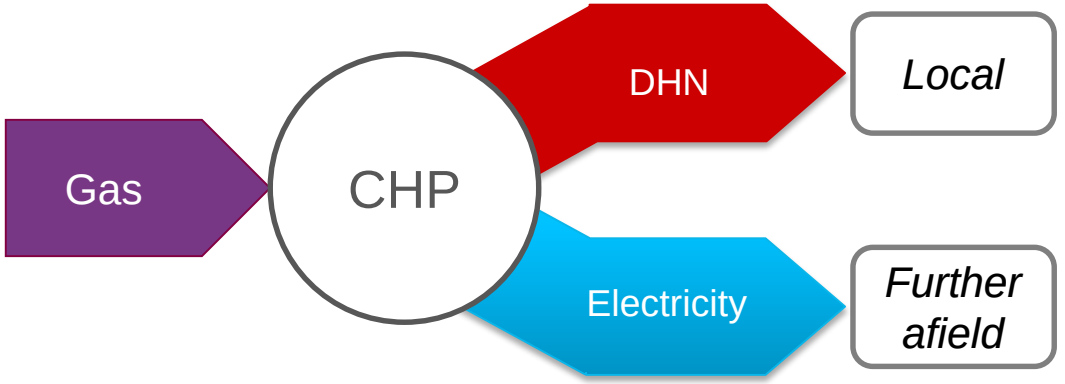
Integrating networks to optimise across energy vectors

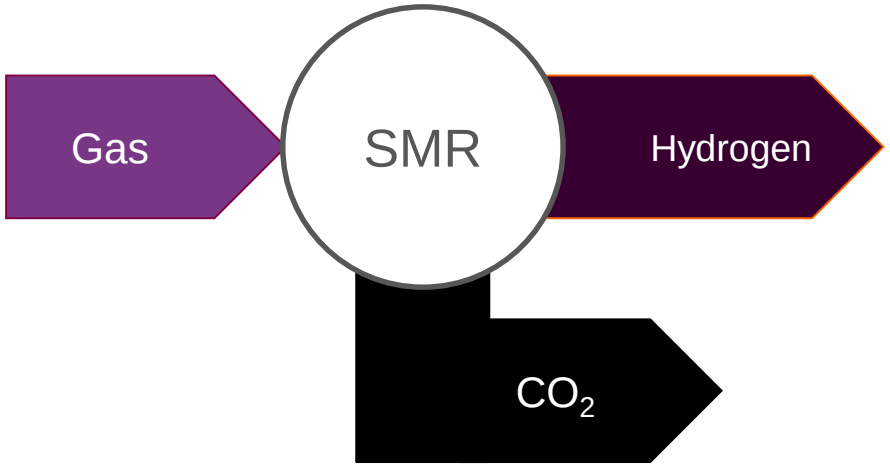
- There are multiple instances where, in future, increased integration between networks could yield benefits
- Interdependencies could arise in terms of:
  - How networks develop
  - How networks are operated
- Development
  - One network replacing another (replacement)
  - Roll-out of one network supporting roll-out of another (support)
  - Roll-out of one network obviating the need for another (obviation)
- Operation
  - A shortfall in energy being available via one network being met by energy supplied by a second network (shortfall substitution)
  - One network providing additional energy when a primary network reaches the limit of its capacity (capacity extension)
  - Two or more networks permanently working in tandem (alliance)



Integrating networks to optimise across energy vectors





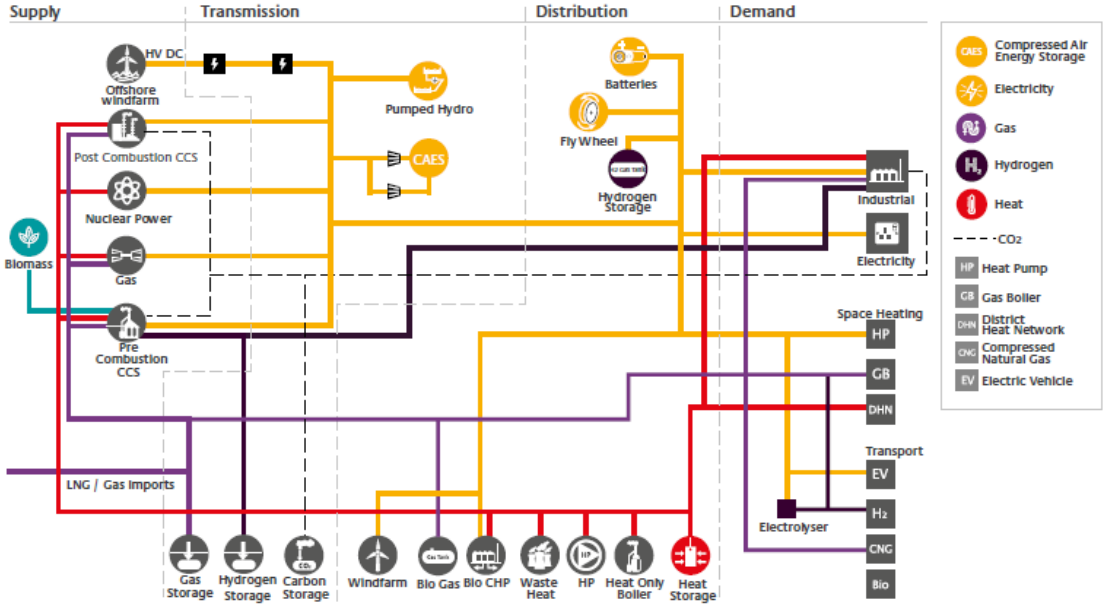


Further examples include:	Encouraging PHEVs to be run on liquid fuels at times of high electricity demand
	Using surplus wind to generate hydrogen
	Feeding surplus wind in remote areas into local heating systems or locally based EVs

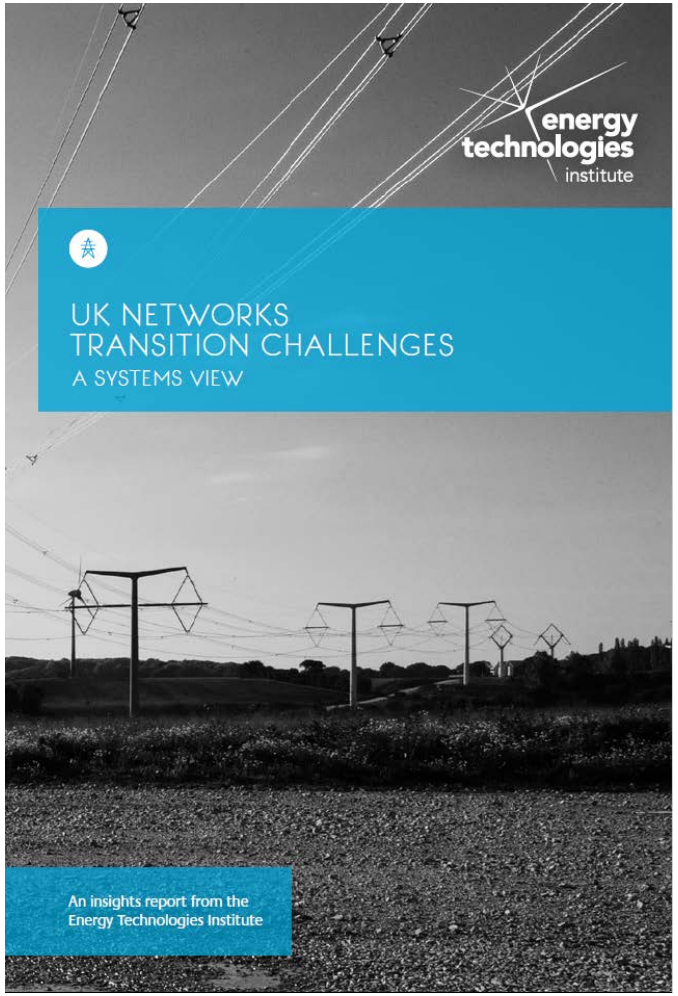
Multi-Vector Integration project

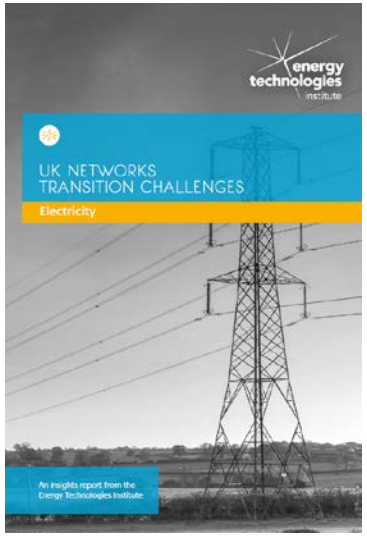
The aim of this project is to understand the opportunity for and implications of moving to more integrated multi vector network(s)

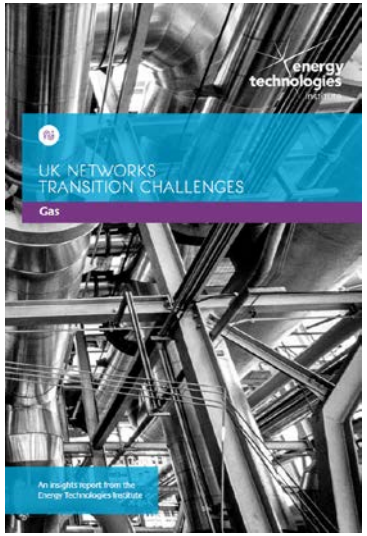
- identifying the ways in which different networks could interact, e.g. one network providing peak capacity support for another
- determining how prominent these interdependencies could be
- examining what the effects on each of the networks would be
- identifying any technology and/or operational opportunities that would facilitate any increased integration between vectors that may emerge

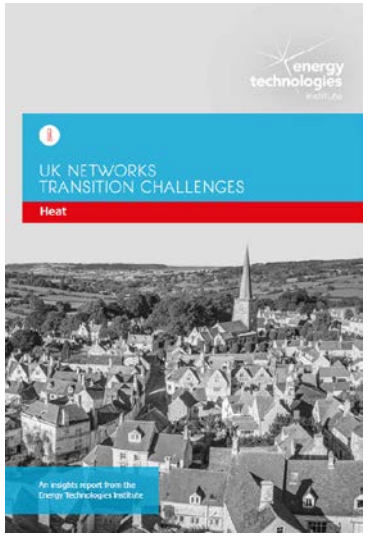


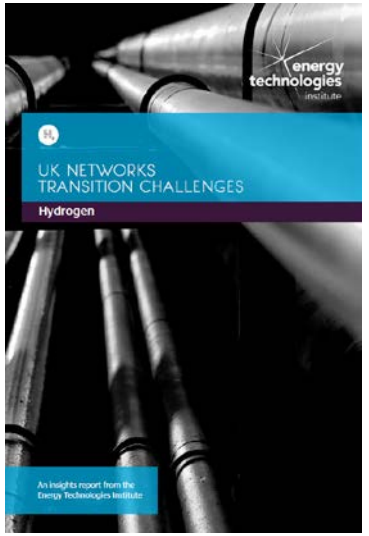
Available on the ETI's website





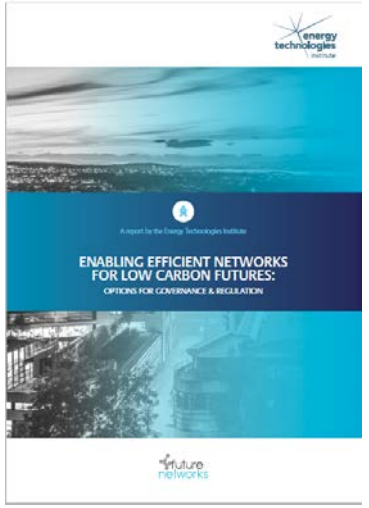




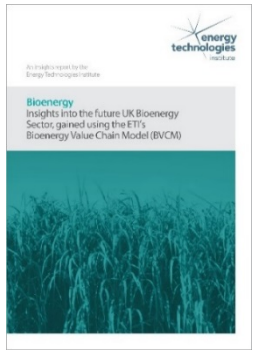


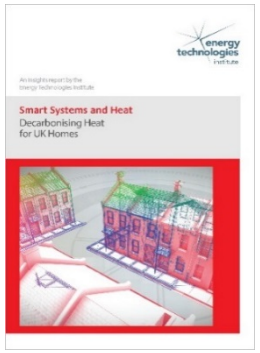
Available at: http://www.eti.co.uk/insights/uk-network-transition-challenges-a-system-view

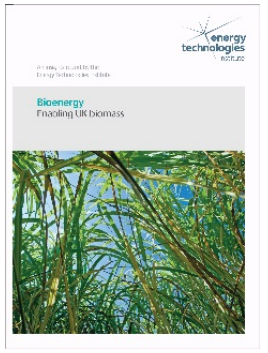
Or search for: ***ETI network transitions*** or ***network transition challenges***

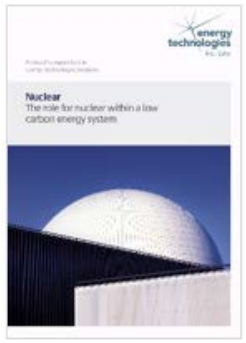


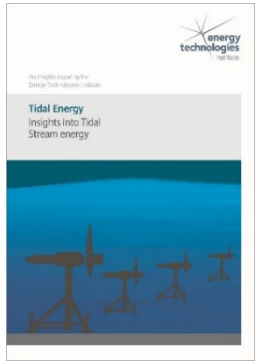
Additional ETI Insights Papers

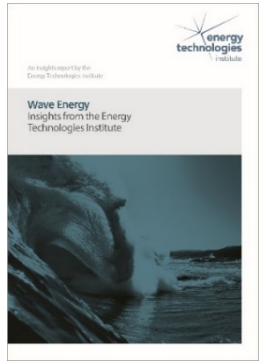


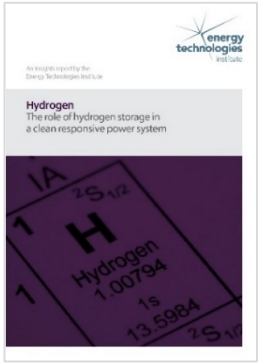


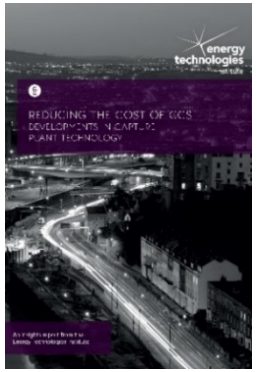


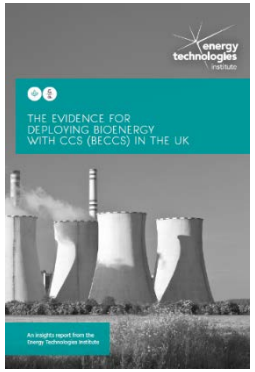












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