Energy options for transport – Phase 1

ERP Plenary Meeting
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• Project objectives
• Outline of UK energy and transport
• Options and limitations for decarbonisation
• Next steps – Phase 2
Objectives

• To explore:
  – Trade-offs between factors within the transport sector
  – Interactions with the wider energy sector

• Joint ERP and GO-Science project
  – Phase 1 update today
  – Seeking views on Phase 2
UK energy and emissions

End-use energy (% of UK total)

Emissions (% of UK total)

Emissions (MtCO₂e)

End-use energy consumption (TWh)

Workplaces

Housing

Industry

Transport

Energy Consumption in the UK (DECC, 2014)
Road vehicles are the largest source of transport emissions.

Transport Energy and Environment (DfT)
Mode switching has a place but with limitations

- Double cycling (from cars) 0.7% total
- All domestic air to rail 1.4% total
- Double rail (from cars) 8.5% total
Savings from non-road fuel switching are relatively small

- 100% LNG in shipping: 0.5% total
- 100% biofuels in aviation: 1.4% total
- 100% rail electrification: 1.8% total
Large variation in confidence and impact.
Energy density is critical for heavy duty road vehicles.

- BEV
- CNG
- LNG
- LPG
- Petrol
- Diesel

Metals

H₂
Other issues are important for light vehicles

• Air quality
  – Zero tailpipe emissions; unintended consequences

• Vehicle size
  – Safety regulations; consumer preferences

• Flexibility of operation
  – Range; refuelling
Competition for low carbon fuels may constrain their use

• Phase 2 to consider ‘best use’ of energy sources
  – Consider constraints and competition
  – Fuel availability and alternatives for each mode
  – Infrastructure capacity implications

• Scenario characteristics
  – Broad scope, covering transport and energy sectors
  – Inputs-based, and not goal-seeking or cost-optimising

• Phase 2 to report at October 2015 plenary
Discussion – Phase 2

• We seek members’ views on:
  – Scale and extent of interactions between transport and energy sectors
  – Bounding conditions in either sector
  – Probable and/or plausible rates of uptake
  – Level of confidence around future technology development
Confidence/impact chart

- **CNG/LNG** (1)
- **Aviation**
- **Hybrid/battery** (2)
- **Biofuels (1)**
- **Biofuels (2)**
- **H₂**
- **H₂**
- **Electric roads**
- **Shipping**
- **Rail**
- **Light**
- **Heavy**

Axes:
- **Confidence**: Low to High
- **Impact**: Low to High