



Department for Transport

Advanced fuels: Call for Evidence

Maritime stakeholder workshop

13 January 2014

Structure of the workshop

- 14.00 Welcome
- 14.10 Overview of the call for evidence
- 14.25 Discussion
- 15.00 End

The call for evidence is a first-stage, evidence-gathering document.

We are keen to receive as much evidence as possible about advanced fuels. This data will feed into new policy development, so we value all contributions.

The call for evidence will run until **21 February**.

Structure of the call for evidence

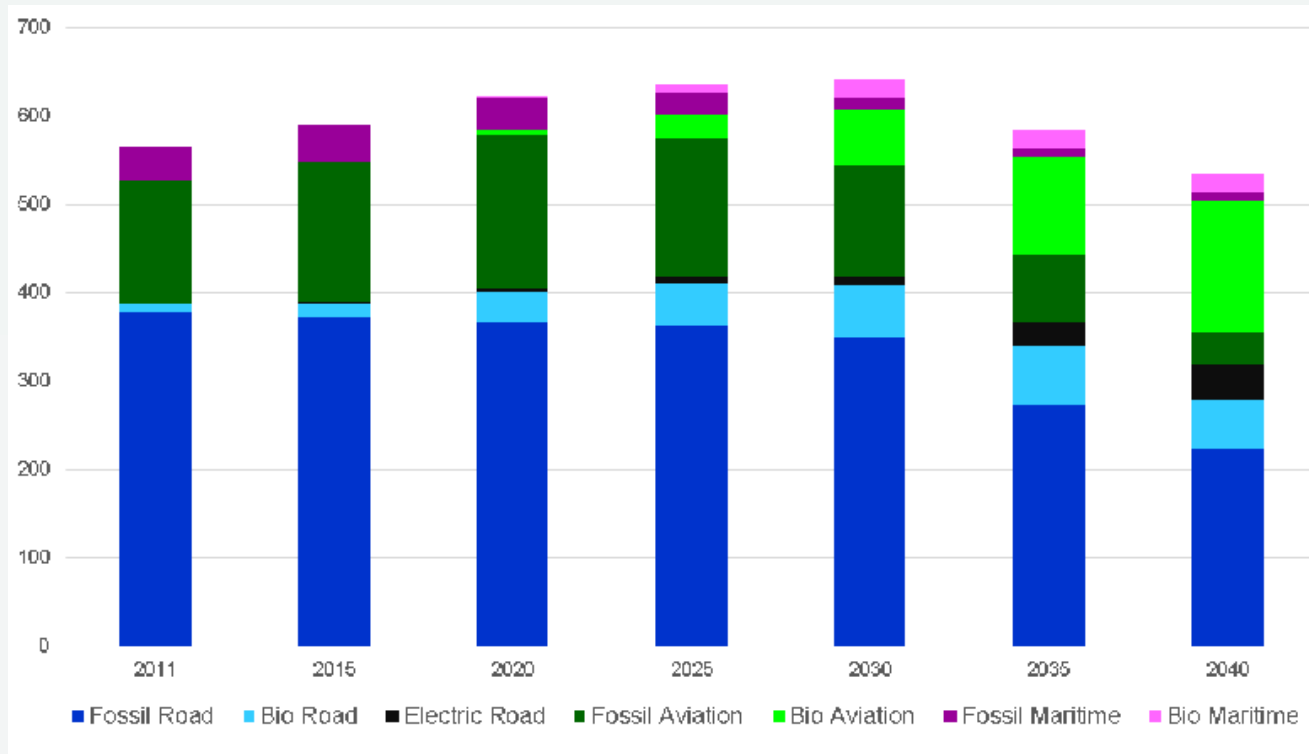
1. Transport sectors
2. Feedstocks and fuels – what is ‘advanced’?
3. Policy mechanisms

These areas will be addressed at the general workshop on the 15 January.

Today, we wish to focus on the particulars of shipping and its unique considerations.

Energy use in the maritime sector

The EU Renewable Energy Directive (RED) requires us to have 10% of transport energy come from renewable sources by 2020.



UK Bioenergy Strategy, quoted in the call for evidence, shows that maritime makes up a relatively small part of energy mix. It estimates that biofuels will make up the majority of maritime energy by 2030.

European Incentive

- The UK, like all member states, is legally obliged to ensure that 10% of its transport energy comes from renewable sources in 2020.
- Energy from international shipping should count towards this target.

International Barriers

- There would be no legal constraints to introducing a biofuel obligation. Unlike in aviation, taxation of international marine fuel is not prevented by international treaty.
- However, the obligation could lead to a rise in fuel prices, which ships could easily evade by bunkering elsewhere.
- Therefore, most likely way that biofuel would be brought into would be through the use of a subsidy. **How would this work?**

Table 5 Estimation of technical compatibility of various biofuel-engine combinations

Fuels	High speed (auxiliary engine)	Medium speed (aux/ main)	Low speed (main engine)
Straight vegetable oil (SVO)	Green	Green	Green
Biodiesel	Green	Green	Green
Hydrotreated vegetable oil (HVO)	Green	Green	Yellow
Bio-methane	Green	Green	Green
Bio-ethanol	Green	Red	Red
Bio-methanol	Green	Red	Red
Di-methyl ether (DME)	Green	Green	Green
Pyrolysis bio-oil	Red	Yellow	Green

- 2012 Ecofys report for European Maritime Safety Agency says that technical issues with the use of biofuels in marine engines are surmountable.

Table 8 Supply chain changes for biofuels in ships

Biofuel	Relative fuel comparison		Bunkering Shore	Bunkering Ship	Storage Onboard storage	Mass needed		Engine type
	Mass needed	Volume needed				Mass needed	Volume needed	
	energy output (fossil = 100%)					onboard fuel storage (fossil=100%)		
DME	150%	200%	DME filling station Ambient temperature, low pressure	DME in cylinder, Ambient temperature, low pressure	DME in cylinder, Ambient temperature, low pressure	180%	400%	Mono fuel
(bio)-LNG	86%	200%	LNG station, connected to (bio) gas grid. Cryogenic temperature, low pressure storage.	LNG in cylinder, Cryogenic temperature, low pressure	Cryogenic storage, either on deck (retrofit) or in the hull (newly build)	144%	400%	Dual fuel or monofuel
(bio)-CNG	86%	450%	Large number of heavy CNG cylinders. Available in standard containers.	CNG cylinders in standard containers.	CNG in cylinders, either in standard containers (retrofit) or in racks (newly build).	240%	900%	Dual fuel or monofuel
Biodiesel B5 (5% blend)	102%	100,5%	Blended with regular fuel	Standard, minor adjustments	Standard, minor adjustments	102%	100,5%	Mono fuel
Biodiesel B100 (pure biodiesel)	116%	110%	Separate tanks with minor modifications (e.g. right paint and correct fuel lines)	Separate tanks with minor modifications (e.g. right paint and correct fuel lines)	Separate tanks with minor modifications (e.g. right paint and correct fuel lines)	116%	110%	Mono fuel
Bio-ethanol E100 (pure ethanol)	160%	200%	Separate tanks with minor modifications (e.g. right paint and correct fuel lines)	Separate tanks with minor modifications (e.g. right paint and correct fuel lines)	Separate tanks with minor modifications (e.g. right paint and correct fuel lines)	213%	200%	Mono fuel

- Which biofuels could be most readily used?
- How are different types of fuel used across the industry?:
- Should we attempt to replicate the current set of fuels or devise entirely new fuels?
- Can some fuels be more readily replaced than others?
- Longer term, what role is there for entirely different fuels (e.g. liquid ammonia)?

- What impact would a subsidy of this kind have on industry?
- At what kind of price level would it need to be in order to be competitive?
- Are there other, easier, opportunities to reduce shipping emissions before looking at fuels?
- What is the turnover rate for ships?

Improving international standards

- Will the next set of changes to ISO8217 have impact on emissions?
- What are the chances of shipping being included in any emissions trading scheme?

Emission Control Areas

- How effective have these been at reducing sulphur levels?
- Could they be replicated/expanded to cover carbon emissions?

Other bodies

- Does the shipping industry have any emissions reduction programmes of its own?
- What role does the IMO play?
- What will the Energy Efficiency Design Index (EEDI) look like in future?