A first sketch of a maritime carbon fuel standard

Jasper Faber, 27 November 2018
CE Delft

- Independent research and consultancy since 1978
- Transport, energy and resources
- 60 Employees, based in Delft, the Netherlands
- Not-for-profit
- Projects on environmental impacts of shipping for over 15 years.

- Clients: International Maritime Organization, European Commission, national and regional governments (Germany, UK, Netherlands), shipping companies, trade associations, ports, and environmental NGOs.

- All our publications [www.cedelft.eu](http://www.cedelft.eu) or @CEDelft

Jasper Faber - 27 November 2018
Outline of the presentation

• Policy context

• The need for regulation of a fuel switch in maritime transport

• Identification and high-level assessment of policy options

• A sketch of a fuel standard

• Conclusion
Policy context

• The Initial IMO Strategy on Reduction of GHG Emissions from Ships
  - Sets out a vision to ‘reduce GHG emissions from shipping and (...) phase them out as soon as possible in this century’
  - Defines Levels of Ambition, including:
    ◦ Improve CO₂ efficiency of maritime transport by 40% in 2030; and
    ◦ Reduce GHG emissions by at least 50% in 2050, relative to 2008.
  - Specifies that the 2050 level of ambition requires ‘the global introduction of alternative fuels and/or energy sources’; and
  - Identifies a list of candidate measures, including:
    ◦ implementation programme for the effective uptake of alternative low-carbon and zero-carbon fuels; and
    ◦ new/innovative emission reduction mechanism(s) to incentivize GHG emission reduction

Jasper Faber - 27 November 2018
Low-carbon fuels: need for regulation

- Low- and zero-carbon fuels are currently much more expensive than fossil fuels and likely to remain so in the foreseeable future
  - Hence, in competitive markets, shipping companies will not use them on a large scale
- Low- and zero-carbon fuels are currently produced in very small quantities
- Several low- and zero-carbon fuels require dedicated infrastructure
  - There is no business case to invest in production facilities or infrastructure without a prospect of demand
- Regulation is required to ensure (a prospect of) demand, either by
  - ensuring that low- and zero-carbon fuels are commercially attractive; or
  - mandating ships to use low- and zero-carbon fuels.
Policy options: identification and assessment

• Carbon levy
  - A gradually increasing levy on the fossil carbon content of marine fuels would make fossil fuels more expensive to use and could result in cost-parity with low- or zero-carbon fuels. The revenues could be used to subsidise low- and zero-carbon fuels in order to gradually increase demand.

• Emissions trading scheme
  - A gradually diminishing cap on the amount of fossil CO\textsubscript{2} emitted by ships would ensure that shipping companies implement all measures to reduce emissions, including low- and zero-carbon fuels when they are cost-effective.

• A carbon fuel standard
  - A gradually decreasing standard for the average carbon content of fuels used by shipping would mandate an increasing use of low- and zero-carbon fuels.
Policy options: identification and assessment

• Carbon levy
  - Cost-effective mitigation, as all measures to reduce emissions can be taken to comply;
  - Politically difficult as the levy would need to be coordinated internationally and it affects sovereign decisions of states on the tax base and rates (*CE Delft 2012*);
  - New instrument to IMO; no precedent at global level.

• Emissions trading
  - Cost-effective mitigation;
  - Need not raise revenues: no resemblance with tax (*CE Delft 2012*);
  - Perceived to be complex;
  - Probably not a strong incentive for innovation
  - New instrument to IMO; no precedent at global level.
Policy options: identification and assessment

- Carbon fuel standard
  - Precedents at IMO for setting fuel standards, e.g. relating to
    - Flash point (SOLAS Chapter 2, IGF Code)
    - Sulphur content (MARPOL Annex VI)
  - A fuel standard does not raise revenues: clearly not a tax
  - May be less cost-effective than a levy or an ETS because non-fuel emission reduction options cannot be (directly) used to comply.
A sketch of a fuel standard

- Headline policy

- Supporting policy instrument
A sketch of a fuel standard

• Headline policy
  - A regulation, e.g. in Marpol Annex VI, mandating that the maximum carbon content of fuel used by ships be reduced from 85% m/m (the current level) to 0% ‘as soon as possible in this century’, e.g. by 2.5 percentage points per year (transition would take 34 years).
  - Because the carbon content of fuels has discrete values, it makes sense to mandate the average carbon content of all fuel used in international shipping.
  - E.g. a 50% of the fleet sailing on H\textsubscript{2} from renewable sources and 50% of the fleet sailing on HFO would have an average carbon content of \((0 + 85)/2 = 42.5\) m/m

• This policy would create a clear market outlook for low- and zero-carbon fuels, and thus create an incentive for innovation and investments in production and bunkering infrastructure.
A sketch of a fuel standard

- Supporting policy instrument
  - In this situation of 50% of the fleet sailing on H₂ from renewable sources and 50% of the fleet sailing on HFO, how could a level playing field be ensured when H₂ is likely to be more expensive?
  - Introduce a baseline- and credit trading scheme:
    ◦ Ships that use fuels with a lower carbon content than required would create credits
    ◦ Ships that use fuels with a higher carbon content than required can buy the credits from the other ships and use them to comply
  - E.g. the carbon standard is 42.5% m/m
    ◦ A hydrogen-fuelled ship would create 42.5 credits per GJ of fuel;
    ◦ A HFO-fuelled ship would need to have 42.5 credits per GJ of fuel.
  - This would spread out the costs of new fuels across the fleet
A sketch of a fuel standard

- Many questions remain:
  - Compliance and enforcement
    - When the *global average* carbon content is regulated, how will flag states enforce, when they only observe a share of the fuel used?
  - Monitoring and reporting requirements
    - For ships
    - For fuel production and supply
  - Impacts on innovation
    - Will the regulation induce innovation sufficiently?
  - Impacts on shipping
  - Impacts on States
  - Et cetera
Conclusions

• A carbon fuel standard merits serious consideration as a mid- or long-term measure under the Comprehensive IMO GHG Strategy because
  - It appears to be an effective instrument to mandate the shift to low- and zero-carbon fuels;
  - It appears to fit in the regulatory experience of the IMO;
  - It circumvents some of the disadvantages of MBMs.

• A carbon fuel standard could be supported by a baseline- and credit trading system to spread the costs of the fuel switch over the shipping sector and ensure a level playing field.

• Many details remain to be developed further.
Thank you for your attention

faber@ce.nl