

# Impacts of European measures to incentivise renewable low-carbon fuels on NL



# CE Delft

- Independent research and consultancy since 1978, focussing on environmental policies
- Transport, energy and resources
- More than 20 years of experience in the shipping sector
- 75 employees, based in Delft, the Netherlands
- Clients: IMO, European Commission, German, UK and Dutch government, shipping companies, ports, trade associations and environmental NGOs.



# Outline of the presentation

- Policy context
  - FuelEU Maritime
  - Renewable Energy Directive
- Aim and scope of the study
- Framework of analysis
- Preliminary results of fuel choice
- Next steps



# Policy context

- Fuel EU Maritime
  - The Commission plans to propose legislation aimed at increasing the demand for ‘renewable and low-carbon fuels’ by ships and voyages subject to the EU MRV
  - There are three options for the requirement:
    1. Minimum shares of specific fuel types;
    2. Maximum limit on GHG content of fuel over the life cycle; or
    3. As option 2, with additionally options for pooled compliance and rewards for over-achievers
      - a. Voluntary pooling
      - b. Baseline-and-credit system



# Policy context

Impact of policy option on fuel choice	
Policy option	Fuel choice
1. Minimum share RLF	Cheapest drop-in RLF
2. Maximum GHG content fuels	Most cost-effective drop-in RLF
3. Pooled compliance	Most cost-effective RLF



# Policy context

- The Renewable Energy Directive (RED) sets minimum shares of renewable energy used in the transport sector (14% in 2030).
- Fuel suppliers have to meet the requirement.
- There is an opt-in for aviation and maritime fuels, which The Netherlands have used.
- Fuels sold as marine bunkers
  - Count towards the transport share
  - Do not count towards the Member State overall share
  - Do not count under the NDC.



# Aim and scope of the study

- Analyse impacts of FuelEU Maritime on the Dutch Maritime sector, in particular on:
  - Fuels used by ships subject to EU MRV;
  - Fuels used by ships not subject to EU MRV;
  - Competitiveness of Dutch shipping companies;
  - Production of RLF;
  - Innovation in marine fuels;
  - Supply of fuels in Dutch ports;
  - Competitiveness of Dutch ports as bunker ports;
  - Dutch climate goals.



# Aim and scope of the study

- Analyse the advantages and disadvantages of the MS opt-in for marine fuels or an EU-wide opt-in



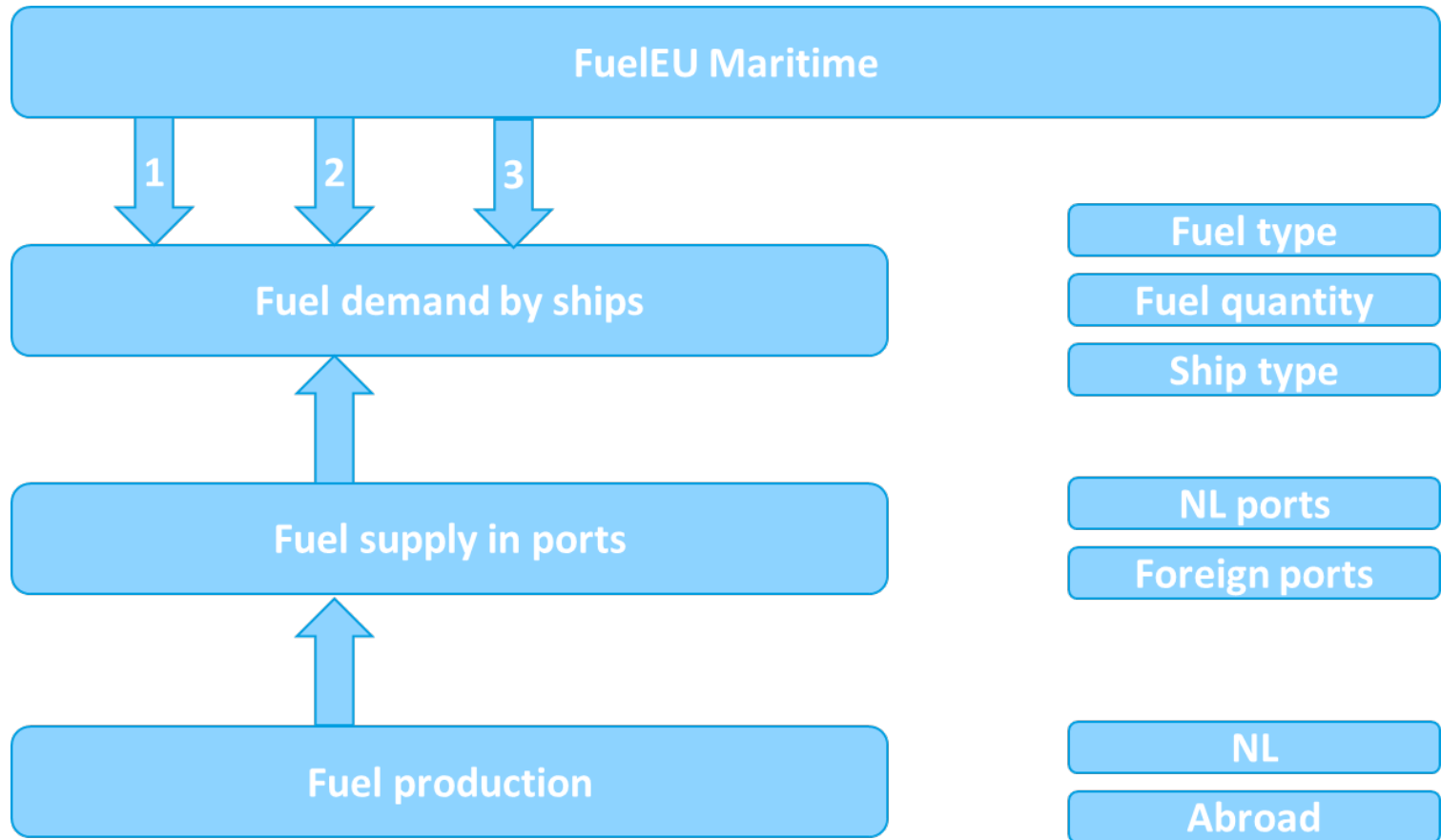


# Aim and scope of the study

- All ship types as included in the Fourth IMO GHG Study
- Fuels:
  - Bio-FAME
  - Biomethane (liquefied)
  - E-methanol
  - E-ammonia (liquefied)
- Assess costs for 2030
- WTW emissions
- Requirement for Fuel EU Maritime: partial reduction in GHG emissions (no full decarbonisation) / partial use of RLF (no requirement to use RLFs exclusively)



# Framework of analysis



# Preliminary analysis of fuel choice

- Total costs of ownership of ships sailing on renewable fuels and conventional fuels, taking into account:
  - Production costs of fuels;
  - Storage in port, bunkering;
  - Energy conversion on board ship;
  - Fuel tanks and piping;
  - Maintenance and repair costs.
- Assumption that the following are the same as for conventional ships or not significant
  - Ship economic life (25 years)
  - Insurance
  - Crew training



# Preliminary analysis of fuel choice

- Total costs of ownership vary per ship type:

Ship type	Size category	Unit	Average Deadweight	Fuel type	Type propulsion system	Bunkering	MINIMUM scenario	MAXIMUM scenario
Bulk carrier	0-9999	dwt	4271	Bio-FAME	ICE	StS	\$ 1.272.368,53	\$ 4.036.538,21
Bulk carrier	10000-34999	dwt	27303	Bio-FAME	ICE	StS	\$ 2.970.026,76	\$ 9.288.128,91
Bulk carrier	35000-59999	dwt	49487	Bio-FAME	ICE	StS	\$ 4.001.283,96	\$ 12.491.233,72
Bulk carrier	60000-99999	dwt	76147	Bio-FAME	ICE	StS	\$ 5.411.834,28	\$ 17.060.835,11
Bulk carrier	100000-199999	dwt	169868	Bio-FAME	ICE	StS	\$ 9.267.186,12	\$ 29.208.696,02
Bulk carrier	200000+	dwt	251667	Bio-FAME	ICE	StS	\$ 12.348.318,84	\$ 39.200.252,96
Chemical tanker	0-4999	dwt	4080	Bio-FAME	ICE	StS	\$ 1.719.855,37	\$ 5.668.669,21
Chemical tanker	5000-9999	dwt	7276	Bio-FAME	ICE	StS	\$ 2.763.616,77	\$ 8.884.278,22
Chemical tanker	10000-19999	dwt	15324	Bio-FAME	ICE	StS	\$ 4.003.489,81	\$ 12.888.320,95
Chemical tanker	20000-39999	dwt	32492	Bio-FAME	ICE	StS	\$ 6.236.808,31	\$ 20.057.656,75
Chemical tanker	40000+	dwt	48796	Bio-FAME	ICE	StS	\$ 6.363.479,53	\$ 20.381.768,66
Container	0-999	teu	8438	Bio-FAME	ICE	StS	\$ 3.293.717,88	\$ 10.599.023,49
Container	1000-1999	teu	19051	Bio-FAME	ICE	StS	\$ 6.341.228,37	\$ 20.162.076,81
Container	2000-2999	teu	34894	Bio-FAME	ICE	StS	\$ 9.208.262,42	\$ 28.952.331,62
Container	3000-4999	teu	52372	Bio-FAME	ICE	StS	\$ 14.470.251,70	\$ 45.270.999,65
Container	5000-7999	teu	74661	Bio-FAME	ICE	StS	\$ 21.571.765,11	\$ 67.378.005,65
Container	8000-11999	teu	110782	Bio-FAME	ICE	StS	\$ 27.282.042,01	\$ 86.119.368,22
Container	12000-14499	teu	149023	Bio-FAME	ICE	StS	\$ 28.507.853,32	\$ 89.911.908,53
Container	14500-19999	teu	179871	Bio-FAME	ICE	StS	\$ 28.379.291,61	\$ 89.585.906,13
Container	20000+	teu	195615	Bio-FAME	ICE	StS	\$ 23.818.213,53	\$ 74.165.589,99
General cargo	0-4999	dwt	2104	Bio-FAME	ICE	StS	\$ 670.632,90	\$ 2.052.717,75
General cargo	5000-9999	dwt	6985	Bio-FAME	ICE	StS	\$ 1.770.935,34	\$ 5.522.308,49
General cargo	10000-19999	dwt	13423	Bio-FAME	ICE	StS	\$ 3.478.673,55	\$ 10.981.419,84
General cargo	20000+	dwt	36980	Bio-FAME	ICE	StS	\$ 5.050.351,05	\$ 15.909.589,11
Liquefied gas tank	0-49999	cbm	8603	Bio-FAME	ICE	StS	\$ 3.373.008,59	\$ 11.073.195,58
Liquefied gas tank	50000-99999	cbm	52974	Bio-FAME	ICE	StS	\$ 11.215.514,03	\$ 36.290.481,91
Liquefied gas tank	100000-199999	cbm	83661	Bio-FAME	ICE	StS	\$ 24.539.300,39	\$ 79.032.931,38
Liquefied gas tank	200000+	cbm	121977	Bio-FAME	ICE	StS	\$ 35.045.677,28	\$ 113.824.513,39
Oil tanker	0-4999	dwt	3158	Bio-FAME	ICE	StS	\$ 1.386.813,68	\$ 4.545.864,76
Oil tanker	5000-9999	dwt	6789	Bio-FAME	ICE	StS	\$ 2.161.509,40	\$ 6.900.086,01
Oil tanker	10000-19999	dwt	14733	Bio-FAME	ICE	StS	\$ 3.342.268,66	\$ 10.647.574,27



# Preliminary analysis of fuel choice

Ranking of fuels based on TCO				
Policy option	Bio-FAME	Biomethane	E-methanol	E-ammonia
1. Minimum share RLF	2	1	-	-
2. Maximum GHG content fuels	1	2	-	-
3. Pooled compliance	1 or 2	2 or 3	4	3 or 1



## Next steps

- Competitiveness of Dutch shipping companies:
  - All ships subject to the same requirements;
  - Competition with land transport.
- Production of RLF:
  - Current location of production of marine fuels;
  - Production location RLFs;
  - Biomass availability; technology; costs of renewable electricity.



## Next steps

- Supply of fuels in Dutch ports and competitiveness of Dutch ports as bunker ports
  - Local production
  - Transport links
  - Storage infrastructure
  - Bunkering infrastructure
- Dutch climate goals
  - NDC
  - EU Green Deal
  - NL Green Deal maritime & inland shipping



Thank you for your attention  
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