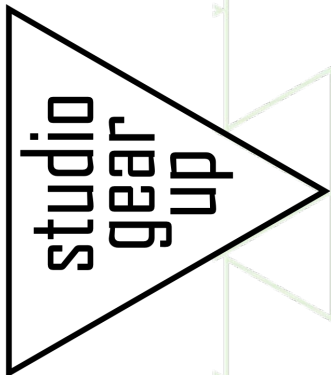
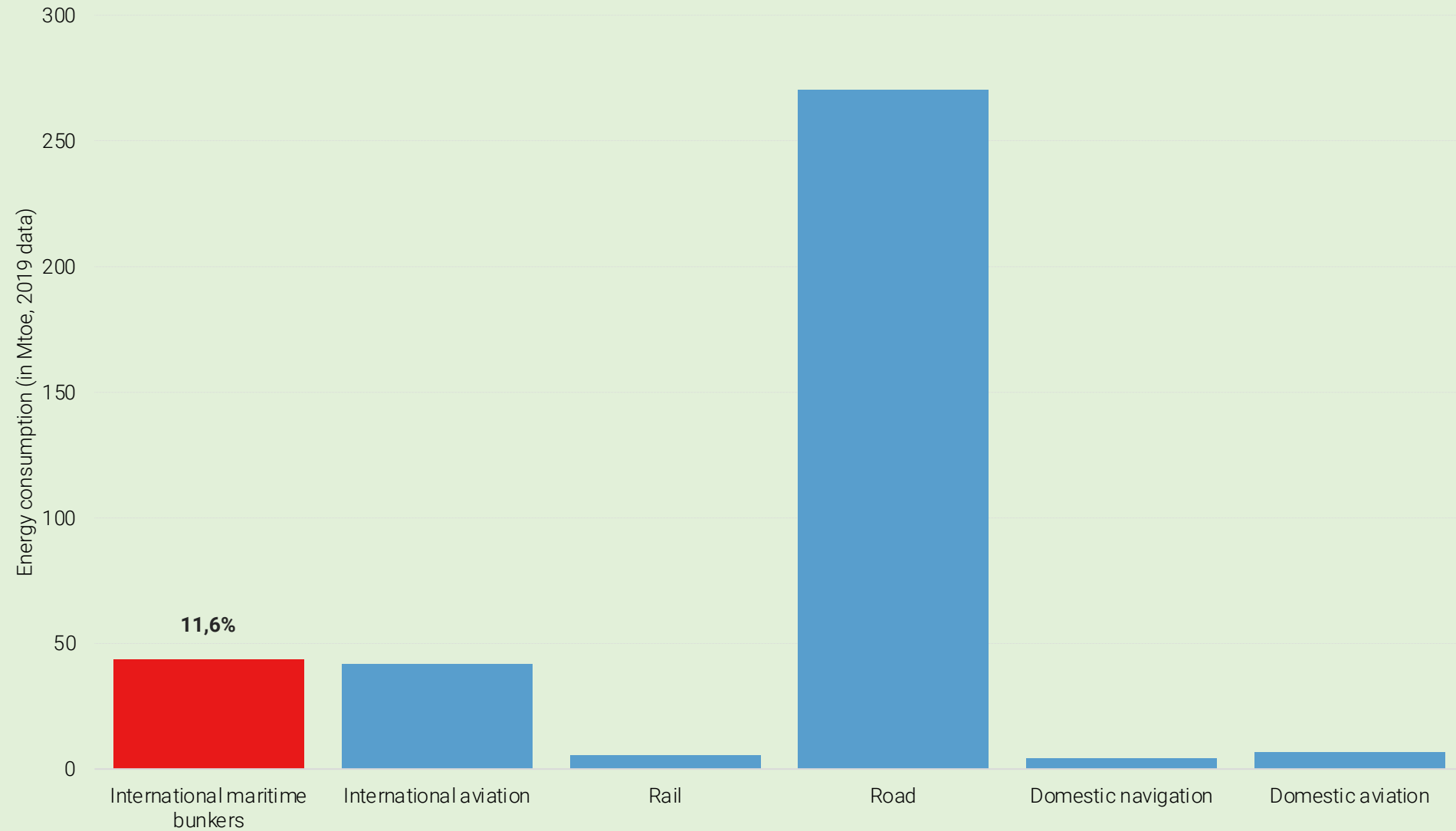


Volumes of renewable fuels as result of FuelEU Maritime regulation

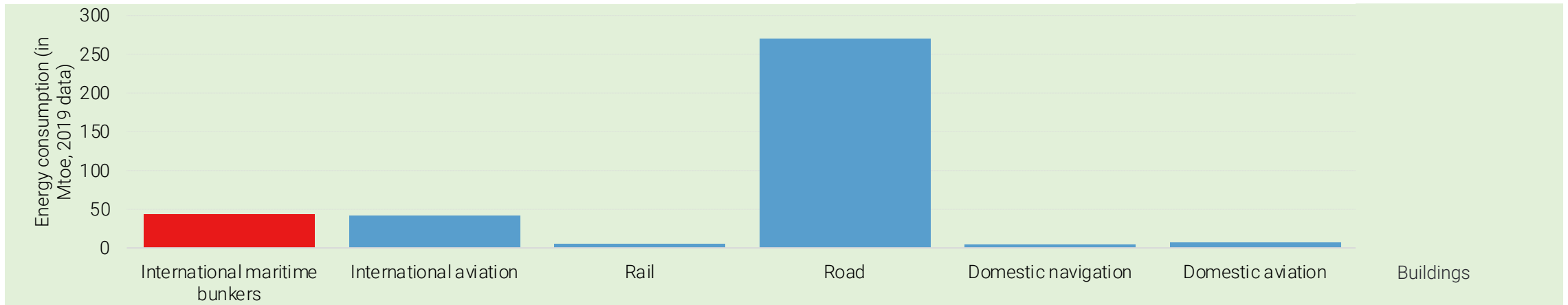


Eric van den Heuvel
EU-SHIPPING-BCE
19 september 2022
Athens, Greece

To place EU maritime energy consumption in context: rather limited compared to energy in EU road transport



Fit for 55 package contains a range of proposals with different scopes



RED2:

Opt-in (in NL)

14% share in 2030 (EU27)

FQD:

-6% carbon intensity

FuelEU Maritime:

-2%/-5% carbon intensity

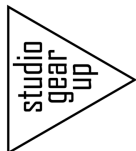
Refuel Aviation:

5% blend mandate

Review RED:

13% lower carbon intensity (EU27), 2,2% IX-A fuels, 2,6% subtarget RFNBO's

ETS R+BE:



[And we did not mention: ETD, ETS and ESR]

The proposals show differences between obligated parties, scope and goals

	FuelEU Maritime	ETS	ETD	REDIII
Obligated party:	Shipowner	Shipowner	Fuel supplier	Fuel supplier
Scope:	<ul style="list-style-type: none"> Intra EU & 50% Extra EU Energy consumption at berth Ships above 5000 Gross tonnage (inland vessels*) are excluded) WtW emissions 	<ul style="list-style-type: none"> Intra EU & 50% Extra EU 100% of emissions at berth Same scope of ships as FuelEU Maritime TtW emissions 	<ul style="list-style-type: none"> Intra EU including inland shipping Optional for MS: Extra EU 	<ul style="list-style-type: none"> All transport segments Including inland shipping, international aviation and maritime
Goals:	<ul style="list-style-type: none"> Focus on GHG intensity Reference year: 2020 <p>-2% by 2025 -6% by 2030 -13% by 2035 -26% by 2040 -59% by 2045 -75% by 2050</p>	<ul style="list-style-type: none"> Focus on GHG emissions Reference year: 2005 By 2030: -61% (over all sectors included in the ETS) 	<ul style="list-style-type: none"> Focus on fuel consumption No goals set 	<ul style="list-style-type: none"> -13% GHG intensity in 2030
Associated costs non-compliance:	About 2,400 €/tonne non-compliant fuel	<p>Current ETS price is around 180 €/tonne fossil fuel</p> <p>Expected: ETS price 90 €/tonne fossil fuel in 2030 and 450 €/tonne fossil fuel in 2050</p>	Fossil: 0.9 €/GJ → € 36/tonne	Determined per Member State

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Scope differs, more complexity and risks for low carbon fuels used in maritime

	FuelEU Maritime	ETS	REDIII	ETD	
				2023	ETD 2020
Fossil fuel	X	X	X	0.9 €/GJ	0.9 €/GJ
Fossil LNG	partially	partially	X	0.6 €/GJ	0.9 €/GJ
Food and Feed Crop	X	✓	Limit +1% level 2020	0	0
Annex IXA	✓	✓	Multiplier 1,2 in aviation ✓	0	0
Annex IXB	✓	✓	Limit 1.7%	0	0
RFNBO	✓	✓	Multiplier 1,2 in aviation ✓	0	0
Electricity (fossil)	✓	✓	X	0	0
Electricity (renewable)	✓	✓	✓	0	0

Expected volumes of low carbon fuels to fullfill FuelEU Maritime

- Total volume needed in 2030: 7% of 44 Mtoe: equiv. of **3 Mtoe renewable fuels**
- Will grow to 15% in 2035 (**6 Mtoe** renewable fuels)
- and 26% (**11 Mtoe**) in 2040 etc.
- Reduction option with fossil based LNG will result in some limits

- What are some options on how to achieve this:

Some options to comply to FuelEU Maritime in 2030

7% blend
in all ships:



60% blend
in 1 of 9 ships:



Retrofit to
LNG:
6 of 9 ships:



Retrofit to bio-
LNG
in 1 of 9 ships:



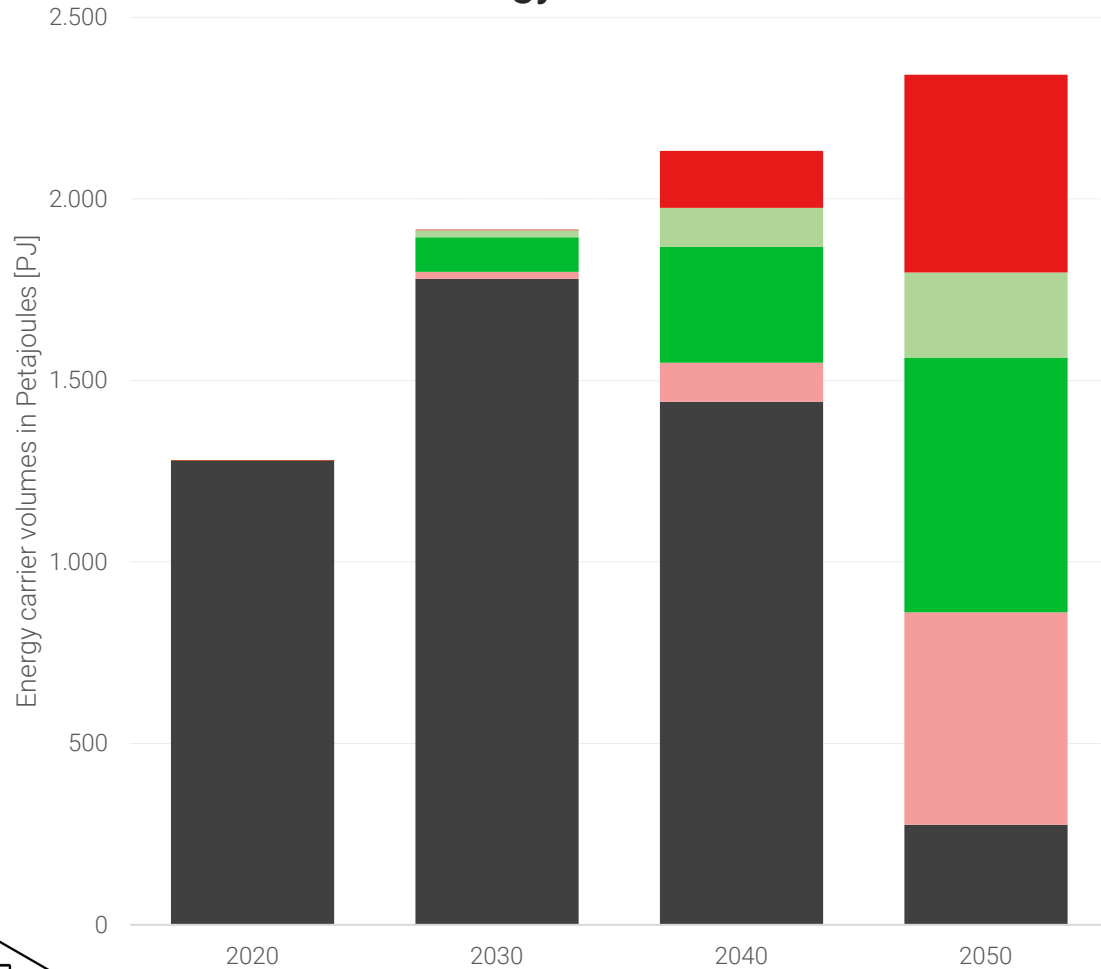
Two explorative scenarios for an outlook for Fuel EU Maritime towards 2050

Scenario's taken from a specific ship fleet owners perspective:

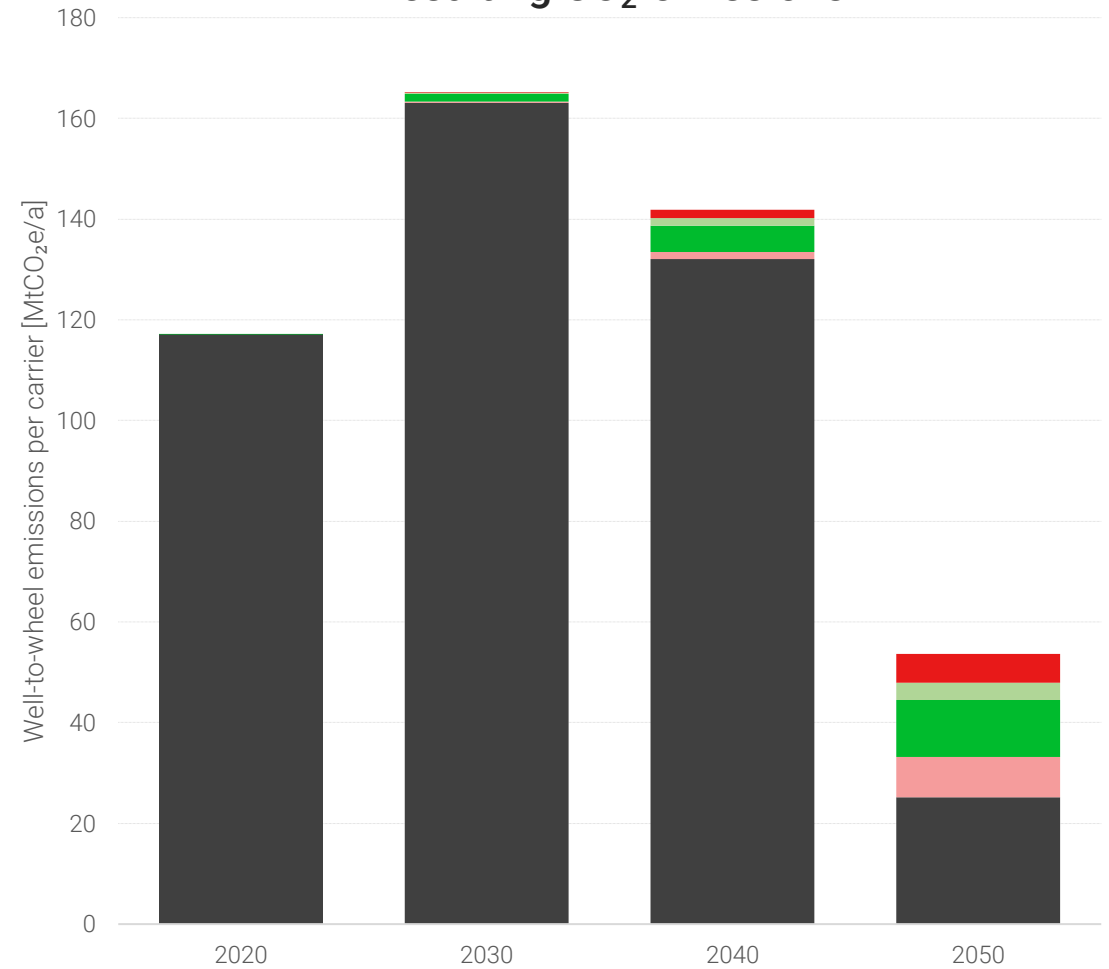
- Aiming at deployment of, as much as possible, 'transitional' fuels, that fit within the the current engine types and similarity to current used fuels
- A shift to alternative fuels and engines that require adaptations to new engines and fuels, such as gas engines and alternative fuels, with a preference to start off with low carbon fossil fuel alternatives
- **Disclaimer:** *these are just two scenarios of many more that could have been chosen, in these underlying specific assumptions on cost advantages have lead to these two scenario's. no general conclusions can be drawn*

Scenario 'transitional and drop in' towards 2050

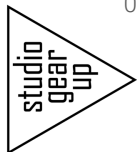
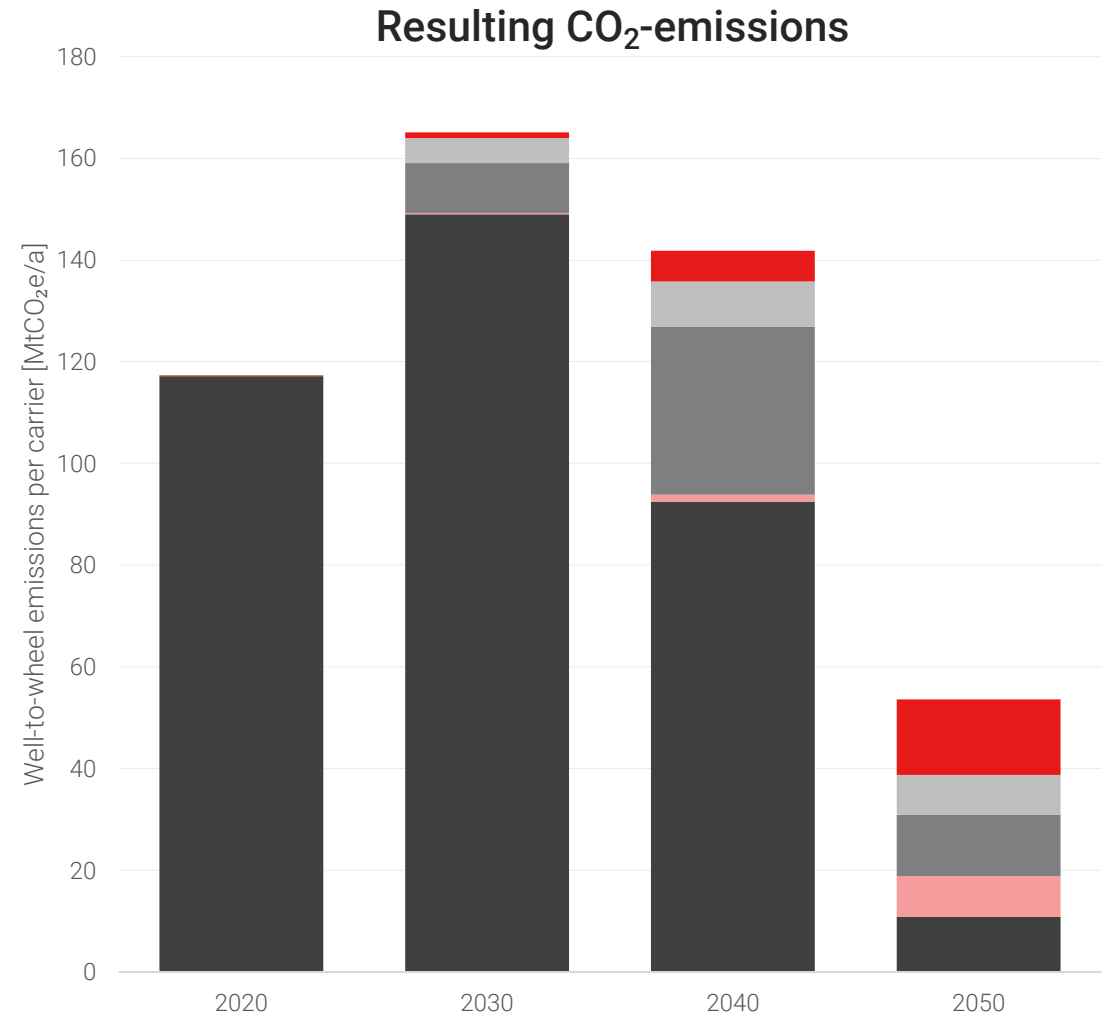
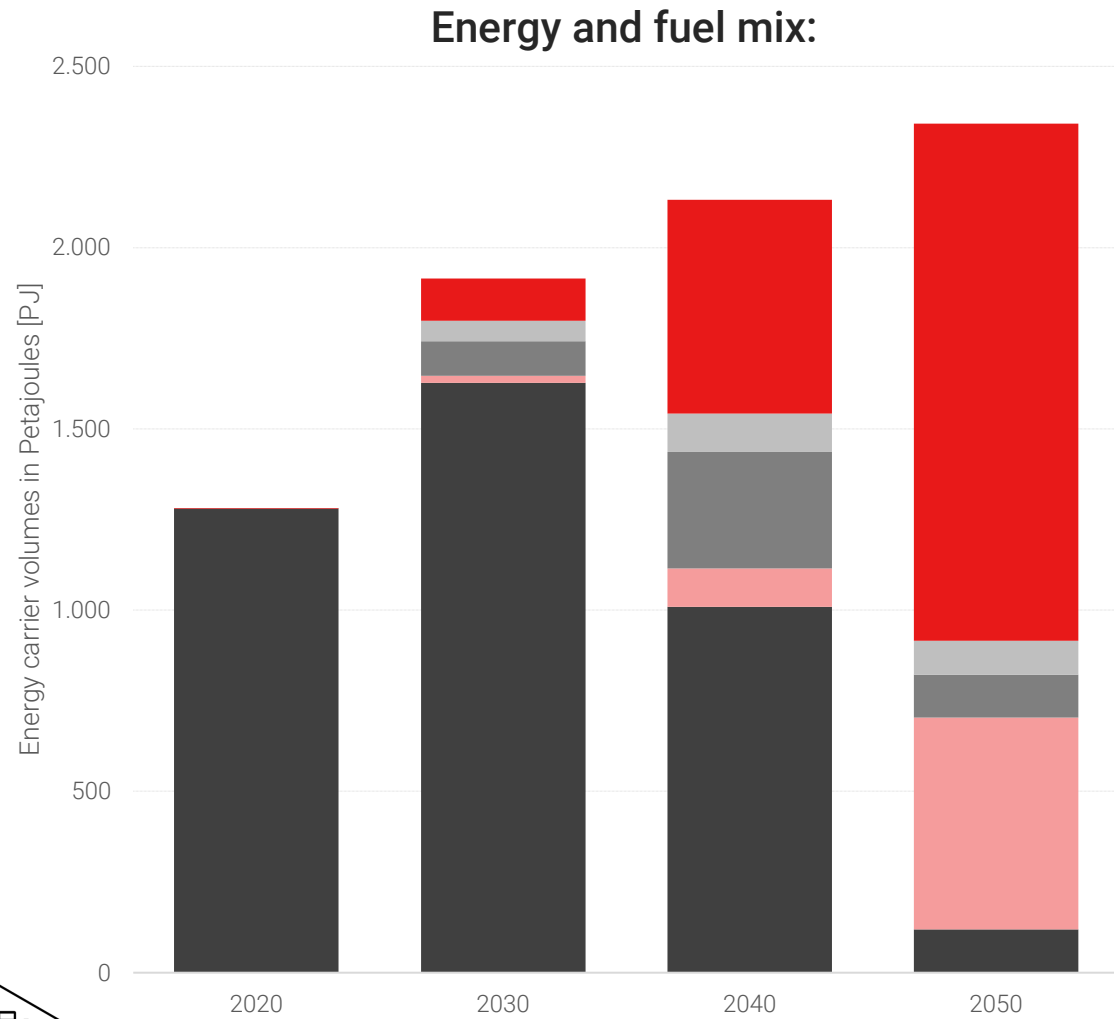
Energy and fuel mix:



Resulting CO₂-emissions



Scenario 'alternative fuel and engine' towards 2050

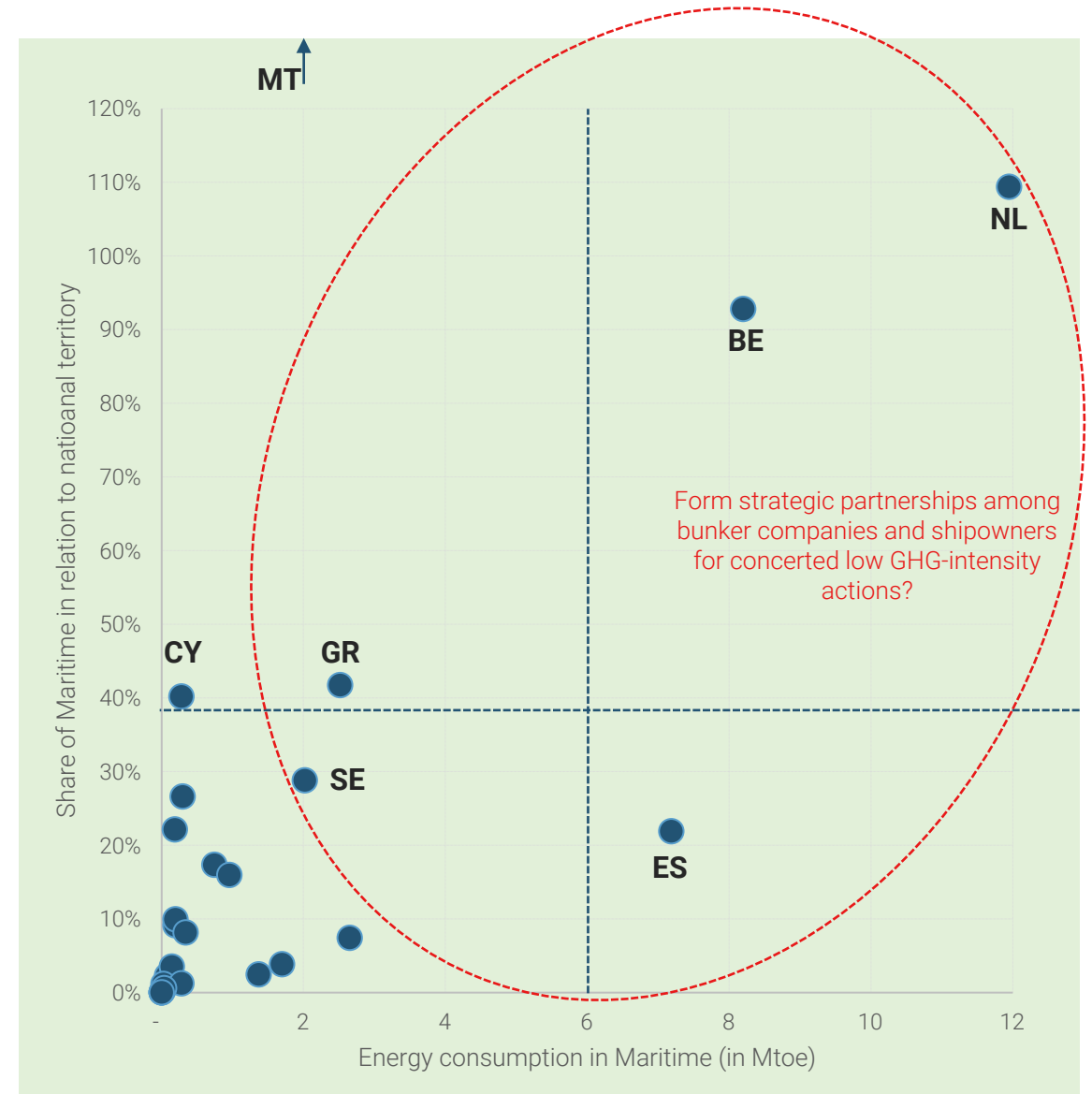
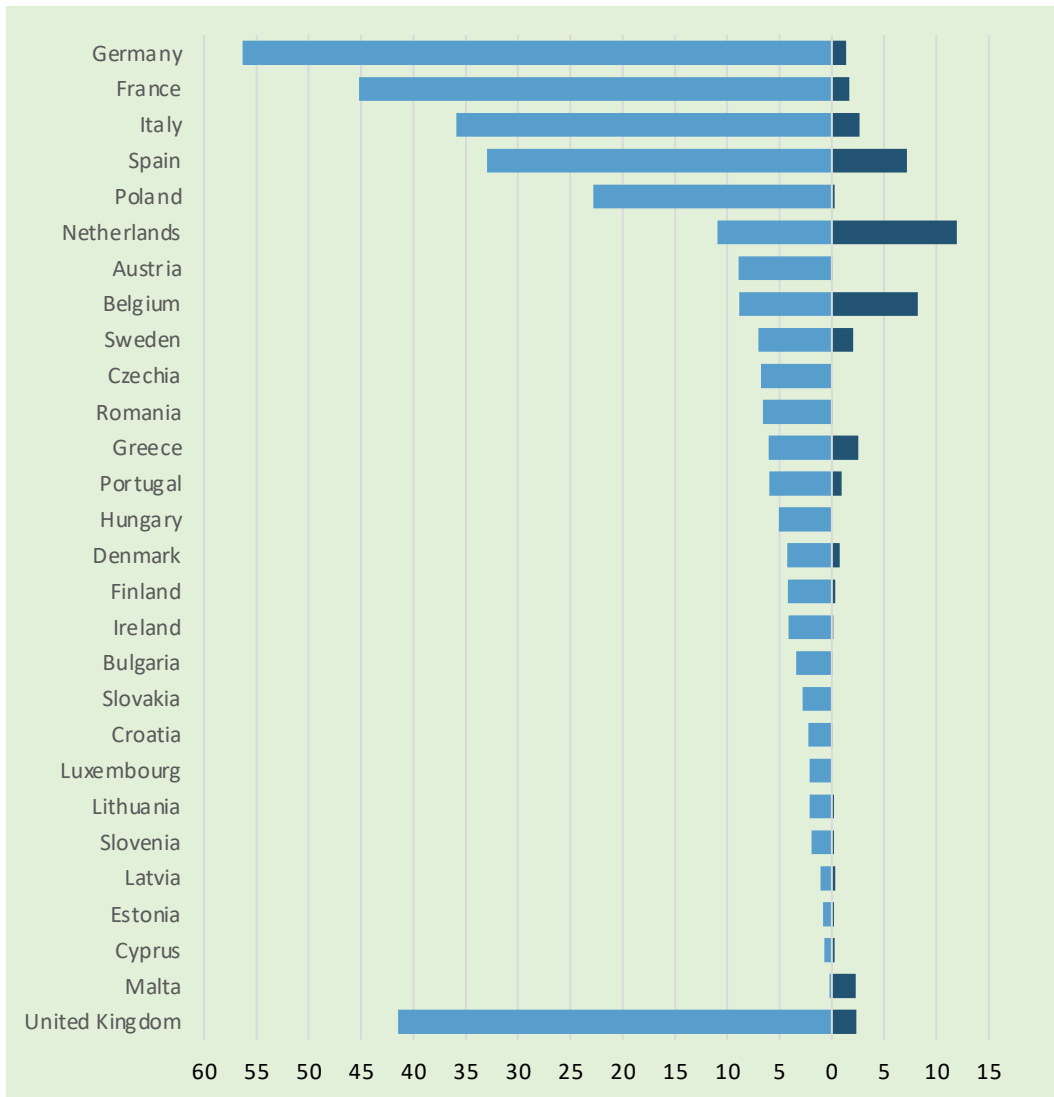


- Advanced methanol
- e-diesel
- Advanced HVO
- Advanced FAME
- LNG
- Fossil methanol
- Remaining conventional fossil

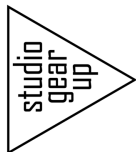
Flexibility and accessibility are of high value for the deployment of options in coming years

- Alternative options like fossil-LNG will not be sufficient in the long-term
- Only using fossil fuel will lead to undercompliance, so diverging the fuel mix is necessary. But be aware that compliance changes over time:
 - Fossil LNG is compliant for a short term and fall short on long term
 - Bio-LNG and e-LNG have longer term long term suitability
 - (Advanced) renewable fuels made out of Annex IX-A and IX-B are compliant for the whole period towards 2050
 - RFNBO's are compliant for the long term (as long as GHG-reduction is above 70% threshold)
 - Biofuels from food and feed crops are not compliant
- Will fossil recourse from energy security perspective still be preferred option?

About fuel volumes: only a few Member States matter... (2019)



Source: Eurostat Energy Balance Database



To wrap up

- Maritime fuel consumption in total Ff55 package not 'big deal' for many MSs
- For some Member States though, it is of strategic importance and concerted action from various actors might be worthwhile to consider.
- Low carbon intensity regulation will come in place and presents a clear decreasing future for conventional fossil maritime fuels
- That regulation is embedded in complex adjacent regulations and directives – and that adds complexity. Enabling flexibility in portfolio may be a de-risk strategy
- Involved parties have various options at hand
- Relying on alternative lower carbon fossil options (like LNG) and other drivetrains (shift to methanol) will probably result in greater dependence at later stage of renewable electricity based solutions. Build-up of that capacity may be outside direct influence to maritime actors.

Questions?

For more information, reach out:

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