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# THE EXTENSION OF THE EU EMISSIONS TRADING SYSTEM TO MARITIME TRANSPORT: IMPLICATIONS FOR MALTESE IMPORTS AND WIDER RAMIFICATIONS

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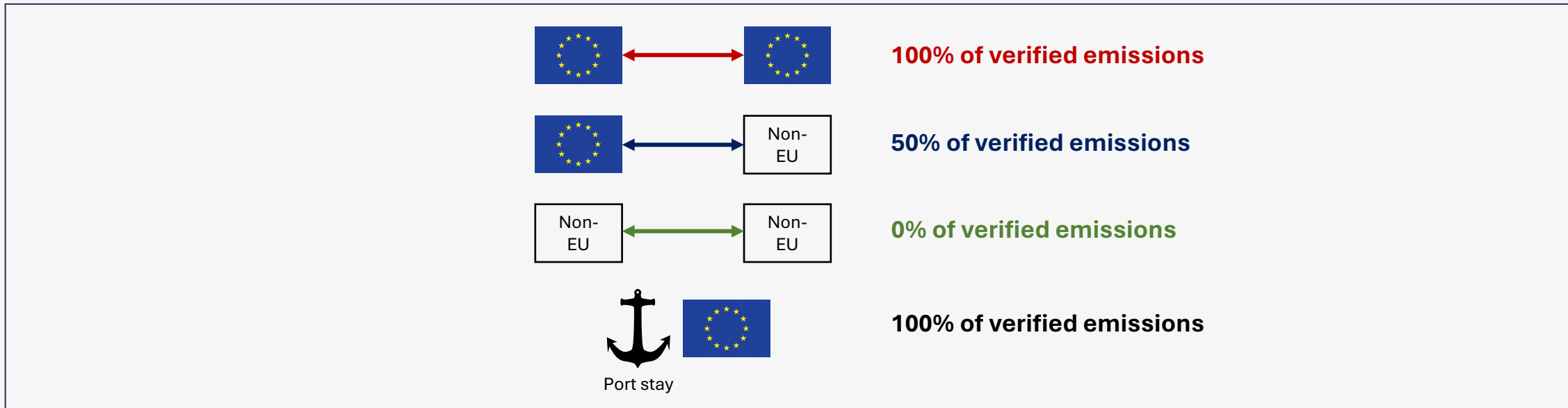
**The views expressed in the presentation are the authors' own and should not be interpreted as reflecting the views of the Central Bank of Malta.**

# EU ETS and the extension to maritime transport

The Emissions Trading System (ETS) is a key tool for the EU to meet its climate targets.

The **Fit-for-55 package** extended the EU ETS to cover **maritime transport** emissions as from **1 January 2024**.

- Reform is **route-based** and **flag-neutral**, covering the emissions of **cargo** and **passenger ships** of 5,000GT+ for:



...in a gradual manner by surrendering enough allowances to cover:

**40%** of 2024 emissions

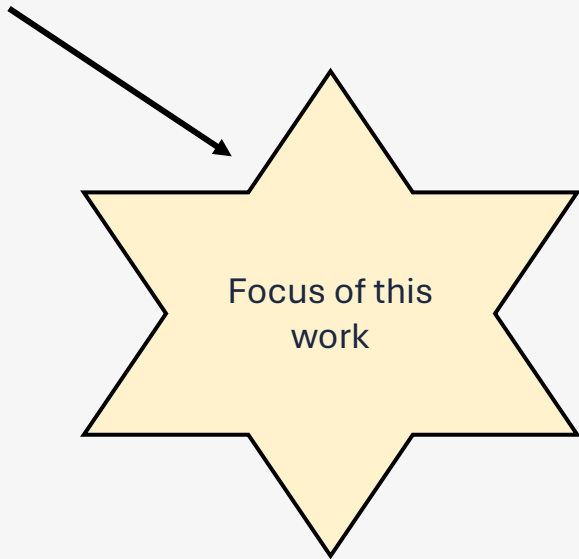
**70%** of 2025 emissions

**100%** of emissions in 2026 and beyond

# Potential implications for Malta

The (potential) implications for the Maltese economy are twofold:

1. **Malta's role as a transshipment hub:** diversion of traffic to nearby non-EU ports may cost Malta its role as a main transshipment hub in the Mediterranean.
2. **Higher (commodity) import prices:** potentially higher commodity import prices if ETS cost is passed on to consumers/industry.



## Key points and assumptions:

1. We assume that any rise in freight shipping costs is **fully passed through** to commodity import prices.
2. We consider the potential economic effects when the extended ETS is fully in place **as from 2026**.

# Data

Two data sources: (1) **Trade-and-Transport dataset** [UNCTAD]; (2) **EU trade by CPA 2.1** [Eurostat].

From (1) **Trade-and-Transport dataset**:

- Annual bilateral trade flows [*weight* and *FOB*] for every traded commodity under the Harmonised System\* (HS) between 2016 and 2021.
- Bilateral trade flows **disaggregated by mode of transport**.
- Bilateral trade flows complemented by the **cost of transportation per transport mode** [*CIF* less *FOB*].

From (2) **EU trade by CPA 2.1**:

- Malta's total imports of each commodity in 2023 [*weight* and *CIF*] by origin country.

\* The products under the HS classification are mapped to the Classification of products by activity (CPA 2.1) to establish similarity with the products' classification considered within the model applied in this work.

# Methodology

- ❑ Simulations will be performed using **MaCGE-MOD** (Cassar et al., 2023) – a CGE model for the Maltese economy.
- ❑ The imposition of ETSs, as seen from the lens of this model, will result in an **increase in commodity import prices**.

=> main objective in simulation design is to **estimate the expected increase in commodity import prices due to EU ETS** extension to the shipping industry.

Assuming that the additional transport costs are fully passed through to import prices:

$$\Delta P_g^M = \Delta TP^E \cdot \widehat{TC}_{2023}^{g,s}$$

Increase in the import price of commodity  $g$

Expected % increase in sea freight rates due to EU ETS

Share of sea transport costs in the *CIF* value of commodity  $g$  imported into Malta in 2023

This necessitates the ‘**off-model**’ calculation of:

1. The **share of sea transport costs** in the *CIF* value of Maltese imports by commodity ( $\widehat{TC}_{2023}^{g,s}$ ).
2. The expected % **increase in sea transport costs** due to the ETS extension ( $\Delta TP^E$ ).

# Simulation Design

## 1. Share of sea transport costs in value of Maltese imports by commodity:

$$\widehat{TC}_{2023}^{g,s} = \frac{\sum_c ufr_{2023}^{g,c,s} \cdot M_{2023}^{g,c,s}}{\sum_c CIF_{2023}^{g,c}}$$

Where:

- $ufr_{2023}^{g,c,s}$  is the per-unit freight rate (€/kg) to transport commodity  $g$  from country  $c$  by sea in 2023.
- $M_{2023}^{g,c,s}$  is the quantity (kg) of commodity  $g$  imported by sea from country  $c$  in 2023.
- $CIF_{2023}^{g,c}$  is the **CIF** value (€) of commodity  $g$  imported from country  $c$  in 2023.

## 2. Expected % increase in sea freight rates due to ETS extension:

$$\Delta TPE = \omega^f \cdot \overline{\Delta Pf}$$

Where:

- $\omega^f$  is the share of fuel in ships' total operating costs, set at **55%** [Mallidis et al., 2018; Mundaca et al., 2021].

$$\Delta Pf = \begin{cases} \frac{3.15 \cdot p^{ETS}}{Pf} & \text{intra – EU voyages} \\ \frac{3.15 \cdot p^{ETS} \cdot 0.5}{Pf} & \text{extra – EU voyages} \end{cases}$$

Where  $Pf$  is the price of 1 ton of VLSFO [assumed fixed at (recent average) \$700/Mt] and assuming that **1 ton of VLSFO emits 3.15tCO<sub>2</sub>** (Lloyd's List, 2021).

# One last unknown...

The extent of the hike in sea freight prices is highly contingent on the **price of emission allowances**,  $P^{ETS}$ .

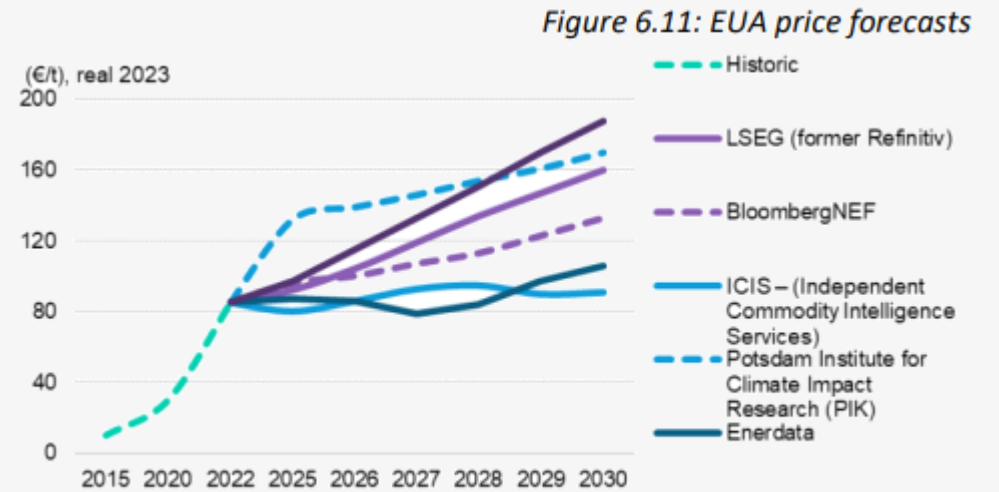
Given the uncertainties around the future development of the EU ETS carbon price, we assume three carbon price scenarios:

**Scenario 1:** ETS price of **€90/tCO<sub>2</sub>** (*Reuters, 2024*)

**Scenario 2:** ETS price of **€150/tCO<sub>2</sub>** (*BloombergNEF, 2024*)

**Scenario 3:** ETS price of **€200/tCO<sub>2</sub>** (*BloombergNEF, 2024*)

... and estimate the **expected increase in import prices by product**.



Source: BloombergNEF, LSEG, Enerdata, ICIS, PIK

Note: Prices are in real 2023 EUR/per metric ton.

Source: Marcu et al. (2024)



# Expected changes in import prices by product

**Table 1**

**EXPECTED INCREASE IN IMPORT PRICES BY PRODUCT DUE TO THE EXTENSION OF EU ETS TO MARITIME TRANSPORT**

<b>Product classification</b>	<i>Assumed EU ETS price (€/tCO<sub>2</sub>)</i>		
	<b>€ 90</b>	<b>€ 150</b>	<b>€ 200</b>
Products of agriculture, hunting and related services	1.1%	1.9%	2.5%
Products of forestry, logging and related services	1.2%	2.1%	2.8%
Fish and other fishing products; aquaculture products; support services to fishing	0.9%	1.5%	2.0%
Mining and quarrying and construction	1.9%	3.2%	4.3%
Food products; beverages and tobacco products	0.6%	1.1%	1.4%
Textiles; wearing apparel; leather and related products	0.9%	1.5%	2.0%
Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	1.3%	2.1%	2.8%
Paper and paper products	0.6%	1.0%	1.3%
Coke and refined petroleum products	0.8%	1.3%	1.8%
Chemicals and chemical products	0.5%	0.9%	1.2%
Basic pharmaceutical products and pharmaceutical preparations	1.1%	1.9%	2.5%
Rubber and plastic products	0.7%	1.1%	1.5%
Other non-metallic mineral products	2.2%	3.7%	5.0%
Basic metals	1.1%	1.9%	2.5%
Fabricated metal products, except machinery and equipment	1.1%	1.9%	2.5%
Computer, electronic and optical products	0.3%	0.5%	0.6%
Electrical equipment	1.7%	2.9%	3.8%
Machinery and equipment n.e.c.	1.8%	3.0%	4.0%
Motor vehicles, trailers and semi-trailers	0.9%	1.5%	1.9%
Other transport equipment	0.1%	0.1%	0.2%
Furniture and other manufactured goods	1.4%	2.4%	3.2%
<b>Average increase</b>	<b>0.8%</b>	<b>1.3%</b>	<b>1.7%</b>

Sources: Authors' calculations using Eurostat and UNCTAD data.

Notes: These expected increases in import prices only reflect the impact of the EU ETS extension to maritime transport, and do not reflect any increase in shipping prices due to other developments, such as those related to the situation in the Red Sea.

The economic effects of these product-dependent import price shocks are simulated using **MaCGE-MOD** (Cassar et al., 2023).

# Simulation Results – macro effects

**Table 2**  
**MAIN MACROECONOMIC EFFECTS OF THE EU ETS EXTENSION TO MARITIME TRANSPORT**  
*(percent deviation from baseline)*

	Assumed EU ETS price (€/tCO <sub>2</sub> )		
	€ 90	€ 150	€ 200
<b>Price and Cost Developments</b>			
Consumption Deflator	0.11	0.19	0.25
GDP Deflator	-0.18	-0.29	-0.39
<b>Economic Activity</b> <i>(constant prices)</i>			
Real GDP	-0.12	-0.19	-0.26
Private consumption	-0.31	-0.52	-0.69
Government consumption*	0.00	0.00	0.00
Gross fixed capital formation	-0.61	-1.01	-1.35
Exports (goods and services)	-0.05	-0.08	-0.10
Imports (goods and services)	-0.18	-0.30	-0.41
Real disposable household income	-0.31	-0.51	-0.68
Household saving ratio** (% of disposable income)	0.00	0.00	0.00
<b>Fiscal Developments</b> <i>(% of GDP)</i>			
Total receipts	0.06	0.07	0.09
Total expenditures	0.09	0.15	0.21
Government balance	-0.04	-0.08	-0.12
<b>Labour Market</b>			
Employment	-0.19	-0.33	-0.44

Notes. \* Government consumption is not impacted in real terms as this is assumed fixed. \*\* Household savings are expressed as a % of Real Disposable Household Income and the resulting % deviation represents the p.p. deviation of this ratio from the baseline.

An ↑ in import prices ↑ overall prices, as evidenced by the consumption deflator.

Higher prices ↓ overall export competitiveness (hence ↓ exports) and dampen domestic demand.

This causes ↓ investment, ↓ imports, and ↓ labour demand.

HHs consumption ↓ in response to lower disposable income.

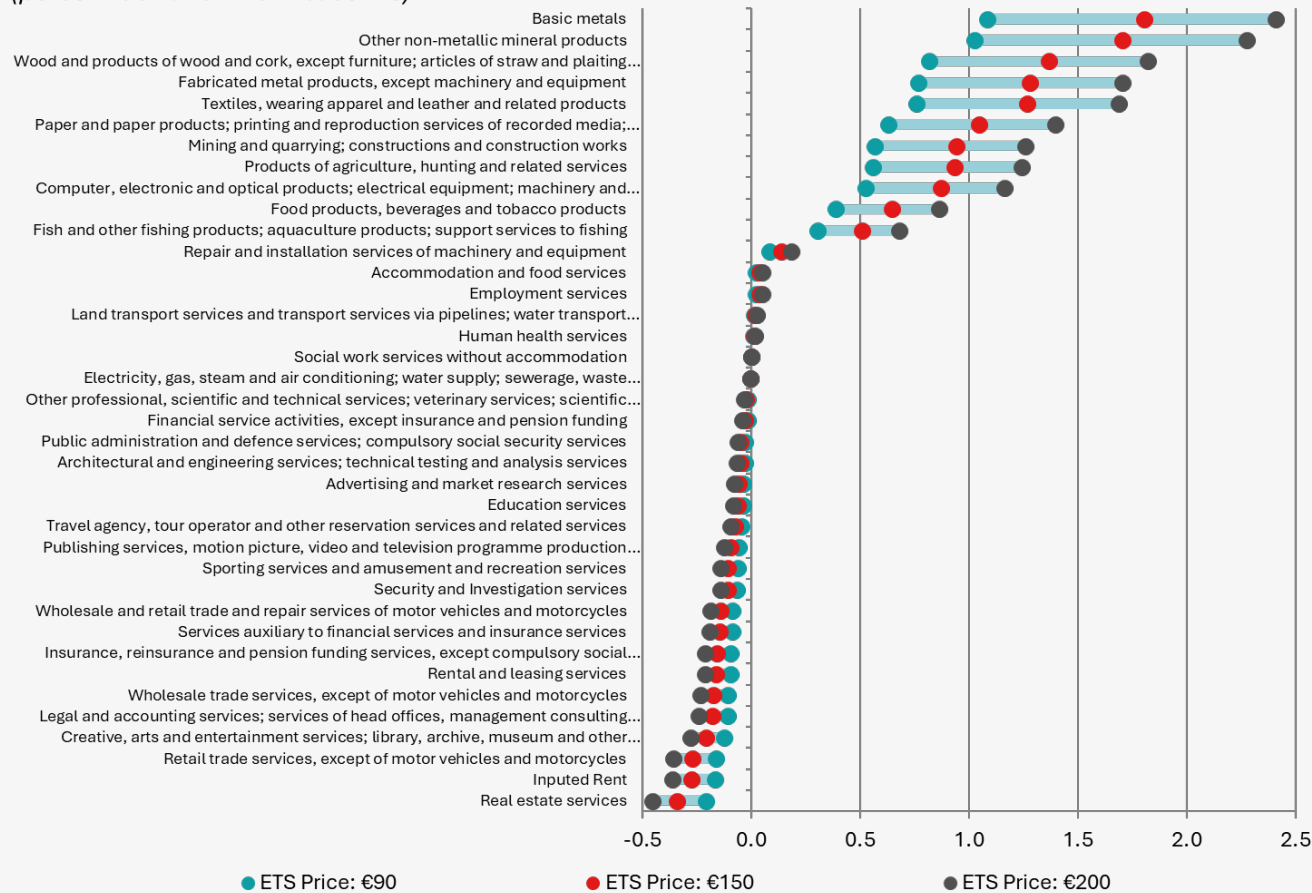
**Net effect on Malta's real GDP is expected to range between -0.12% and -0.26%, depending on the ETS price.**

Fall in GDP is largely driven by lower C and lower I, but is somewhat cushioned by the fall in M.

Fiscal developments are largely driven by a denominator effect: ↓ receipts (absolute terms) and stable government expenses. ETSs revenues are NOT taken into consideration within the model.

# Simulation Results – commodity prices & exports

**Chart 3**  
**EFFECT OF THE EU ETS EXTENSION ON COMMODITY PRICES**  
*(percent deviation from baseline)*



Source: Authors' calculations.

Most pronounced price hikes are expected for products directly impacted by the shock.

Potential impact varies with the ETS carbon price. **BUT price increases are expected to be generally contained**, with increases limited to less than 2.5% (even if ETS price → €200/tCO<sub>2</sub>)\*

Exports of commodities directly subject to higher import prices ↓ by 0.5% - 1.2% in real terms.

Services products typically become cheaper as the shock takes effect, largely due to subdued economic activity.

Most of the *services* sectors' output becomes more price-competitive, leading to ↑ real exports. This **cushions the impact of the shock on Malta's overall exports.**

\* For reference, the EC (2021) estimated that **at an ETS price of €55** by 2030 (in 2020 values), most commodities relevant for European trade would experience a **price increase limited to 0.5%** by 2030.

# Simulation Results – sectoral impacts

**Table 3**  
**IMPACTS ON REAL GVA BY ACTIVITY FROM THE EU ETS EXTENSION TO MARITIME TRANSPORT**  
*(percent deviation from baseline)*

	Assumed EU ETS price (€/tCO <sub>2</sub> )		
	€ 90	€ 150	€ 200
Manufacture of basic metals	-0.75	-1.24	-1.65
Manufacture of other non-metallic mineral products	-0.63	-1.04	-1.39
Manufacture of fabricated metal products, except machinery and equipment	-0.62	-1.02	-1.36
Mining and quarrying and construction	-0.59	-0.99	-1.31
Manufacture of computer, electronic and optical products, electrical equipment, machinery and equipment n.e.c., motor vehicles, trailers and semi-trailers, Other transport equipment and of furniture; other manufacturing	-0.57	-0.94	-1.25
Manufacture of paper and paper products, printing and reproduction of recorded media, manufacture of coke and refined petroleum products, chemical products, basic pharmaceutical products and pharmaceutical preparations and rubber and plastic products	-0.51	-0.84	-1.12
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	-0.51	-0.84	-1.11
Manufacture of textiles, wearing apparel and leather products	-0.43	-0.72	-0.96
Crop and animal production, hunting and related service activities	-0.43	-0.72	-0.96
Imputed Rent	-0.42	-0.70	-0.93

Source: Authors' calculations.

The product-specific results are closely reflected in the shock's impact at the sectoral level.

Sectors mostly impacted are those which are intrinsically linked to **the commodities subject to strongest price increases.**

These sectors make relatively intense intermediate use of such commodities => **exposed to higher input prices.**

# Summary of main results

1. The **increase in Malta's commodity import prices should, on average, be limited to less than 2%** (even at an ETS price of €200/tCO<sub>2</sub>).

- *This is largely due to shipping costs typically constituting only a relatively minor share of the value of Maltese imports.*
- *But depends on assumptions about ETS price, fuel prices, and shipping companies' port schedules.*

2. **↑ import prices are likely to have wide-ranging effects:**

- ↑ consumer prices
- ↓ private consumption
- ↓ investment
- ↓ exports
- ↓ imports



3. Commodities and industries **directly exposed to higher commodity import prices** are expected to record **the most pronounced negative economic effects.**

# Main Caveats

1. Analysis based on the potential effects as from 2026. **Effects will likely be less pronounced in the shorter-term** as shipping companies are required to surrender allowances *in lieu* of only a proportion of their verified emissions.
2. Key assumption: **no changes to underlying profit margins of shipping companies/importers.**
3. No consideration of the ongoing situation in the Red Sea.
  - This causes lengthier voyages as ships *en route* to Europe avoid the Suez Canal shipping route.
  - Diversions → ↑ fuel consumption → ↑ emissions → ↑ ETS cost.
4. No consideration of indirect effects, related to hikes in other countries' import prices, which might spill over in the local context.

# Other Considerations

- ❑ The full repercussions of the reform can only be dissected once more information comes to light. Much will **depend on the evolution of the ETS carbon price**.
  
- ❑ **Any changes in shipping companies' strategies** and decisions could also determine the extent of the policy's impact.
  
- ❑ Further work is needed to understand the policy's impact on **Malta's role as a transshipment hub**.
  
- ❑ It would also be useful to analyse the impact of **other elements of recent environmental reforms**, namely:
  - The applicability of the EU ETS to passenger (cruise) ships.
  - (Potentially) the extension of the Energy Tax Directive (ETD).
  - The phasing out of free allowances for the aviation sector.

**Thank You**



# Reserve Slides

# Background to the Emissions Trading System (ETS)

## WHAT IT IS

- ❑ A cap-and-trade system first launched in 2005.
- ❑ An application of the '*polluter pays principle*'.
- ❑ Applies in all EU countries + Iceland, Liechtenstein and Norway.
- ❑ Used to cover *electricity, manufacturing and aviation*.
- ❑ **Extended to maritime transport on 1<sup>st</sup> January 2024.**

## HOW IT WORKS

- ❑ The EU sets an upper limit (i.e. a '**cap**') on the volume of GHGs that can be emitted by the subjects within the system's scope.
- ❑ This cap is expressed in '**emission allowances**'\* and is reduced annually in line with climate targets.
- ❑ Companies must purchase enough allowances to fully compensate for their annual verified emissions.
- ❑ Allowances are sold in auctions and may also be traded.

\* 1 allowance permits the emission of one tonne of CO<sub>2</sub>eq.

# Share of sea transport costs in Maltese imports

## In Malta's case:

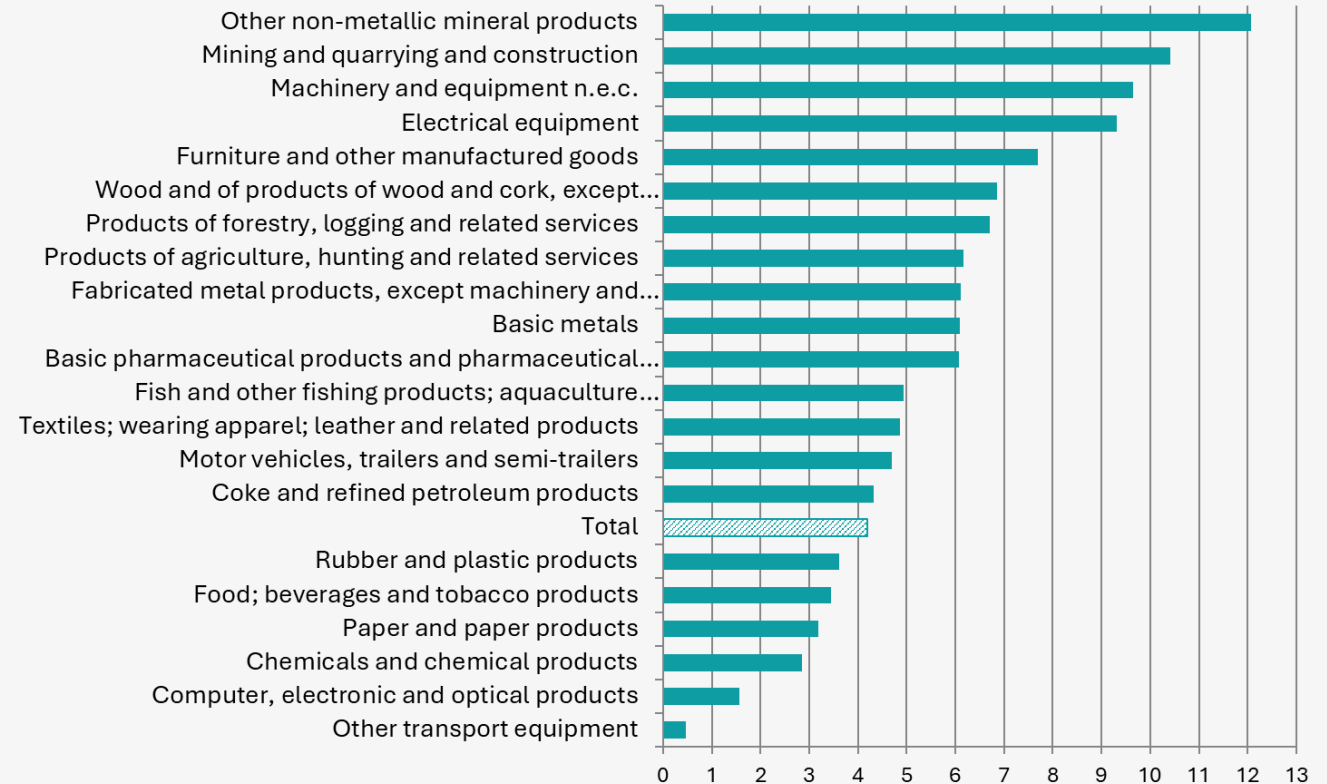
- ❑ Largest share of sea transport costs for **Other non-metallic mineral products** and **Mining and quarrying and construction**.
- ❑ High-value commodities (e.g., **Other transport equipment; computer, electronic and optical products**) have the lowest share of sea transport costs.

*These shares of sea transport costs do not reflect recent atypical developments in the shipping industry, namely the increases in shipping costs in the aftermath of the COVID-19 pandemic and the Red Sea crisis.*

Chart 1

## SHARE OF SEA TRANSPORT COSTS IN MALTESE IMPORTS

(percent of CIF values)



Source: Authors' calculations using Eurostat and UNCTAD data.

Note: For each commodity, the share of sea transport costs is calculated as the ratio of the total sea transport expenditure to the total CIF import value of the respective commodity for the year 2023. Total reflects the economy-wide average share of sea transport costs in CIF values of imports in 2023.

# MaCGE-MOD

- ❑ A **multi-input, multi-output** and **multi-sectoral** CGE model.
  
- ❑ A **static** model => the economic impact of a shock reflects the total effect in the medium-run once all direct, indirect, and induced effects have propagated through the economy.
  
- ❑ Calibrated on the **2015** Social Accounting Matrix (**SAM**) for Malta.
  - 44 production activities
  
  - 44 commodities
  
  - 6 institutional sectors
  
  - 4 types of taxes

# MaCGE-MOD – Production side of the model

## Expected effects of the shock

Any shock that raises the import price of a commodity is expected to:

1. Raise the aggregate price level of the commodity.
2. Dampen intermediate- and final demand for the commodity.

Assumed **Leontief** technology between **domestic production** and **imports**.

=> Supply of commodities in Malta is a fixed bundle of the quantity produced domestically and imports.

Chart 2  
PRODUCTION SIDE OF MaCGE-MOD

