ECG
Business Intelligence

Emission Trading System hits Transport

How Carbon Pricing is pushing Transport to go Green fast

ECG Business Intelligence

AUTOMOTIVE ULTIMAMEDIA
Global Business Intelligence

Contents

Chapter 01 – Overview | Slide 03

- *Fit for 55*
- EU Emission Trading System (ETS) under *Fit for 55*
- Simple Overview of ETS
- Why EU extended ETS to include Transport
- Carbon Pricing Systems – Carbon Tax & ETS

Chapter 02 –Terminology | Slide 08

- ETS Terminology Part 1 –Market Stability Reserve, International Credits, Auctioning
- ETS Terminology Part 2 – Registry, Emission Cap & Allowances
- ETS Terminology Part 3 – Free Allocation, Carbon Leakage, Carbon Border Adjustment Mechanism

Chapter 03—2021 Changes to ETS | Slide 13

- Changes to ETS
- Maritime from 2022, Road Transport from 2026
- ETS & Carbon Taxes form Social Climate Fund
- Maritime ETS
- EU ETS directives for Maritime
- What is Effort Sharing Regulation (ESR)?
- Road Transport ETS is ESR
- Facts & Fixes for Road Transport
- Quick Overview: Caps, Fines, Funds

Chapter 04 – Car & Van Market | Slide 22

- 2021 Emission Performance Standards –move to WLTP
- Clean Air For Europe Mandate – fines for non compliant
- Pooling to avoid Carbon emission fines
- OEM carpools 2021

Chapter 05 –Outcomes & Conclusion | Slide 26

- Agreements from COP26
- What EU ETS means for you:
- If you are a shipowner
- If you are a road transporter

Credits | Slide 30

- Contact details

Overview

Fit for 55

Emission Trading System

Overview: *Fit for 55*

- Aim: Reduce Net Emissions by 55% by 2030 compared to 1990 & Europe to be First Climate Neutral Continent by 2050
- Package of Proposals:
  - **European Green Deal** set the blueprint for transformational change
    - Strategies on biodiversity, circular economy, zero pollution, hydrogen, batteries, offshore renewable energy
  - **NextGenerationEU** fund for 2021-2027
    - 37% to green transition
  - **2030 Climate Target Plan:** Transport Sector
    - Decoupling growth from CO_2 emissions
    - Increase renewable energy to 24% share by 2030 (up from 6% in 2015)
      - Further deployment of electric vehicles (EVs)
      - Deployment of advanced biofuels
      - Secure access to batteries for EVs
      - Clean hydrogen access for heavy duty transport
- **Strategy for Sustainable & Smart Mobility**
  - Pathway to twin green and digital transition for a sustainable transport system
  - By 2030 passenger cars to decrease CO_2 emissions by 50% per kilometre compared to 2021 levels.
  - EU to create markets for low-carbon products: Certification systems based on greenhouse gas (GHG) performance and carbon removals
  - Non C02 emissions of methane, nitrous oxide and F-gases to be reduced by 35% by 2030 compared to 2015 levels (represented 20% of emissions in 2015).
  - ReFuelEU Aviation
  - FuelEU Maritime
- EU Climate Legislation:
  - **Emissions Trading System (ETS)**
  - **Effort Sharing Regulation (ESR)**
  - **Land Use, Land Use Change & Forestry (LULUCF)**

EU Emission Trading System (ETS) under *Fit for 55*

Social Climate Fund

As part of the revision of the EU emissions trading system (EU ETS) under the Fit for 55 legislative package, the European Commission is proposing to extend emissions trading to the building and road transport sectors.

Emissions from these sectors will not be covered by the existing EU ETS, but by a new, separate emissions trading system.

To address any social impacts that arise from this new system, the Commission proposes to introduce the Social Climate Fund.

Social Climate Fund: €72.2 billion between 2025-2032

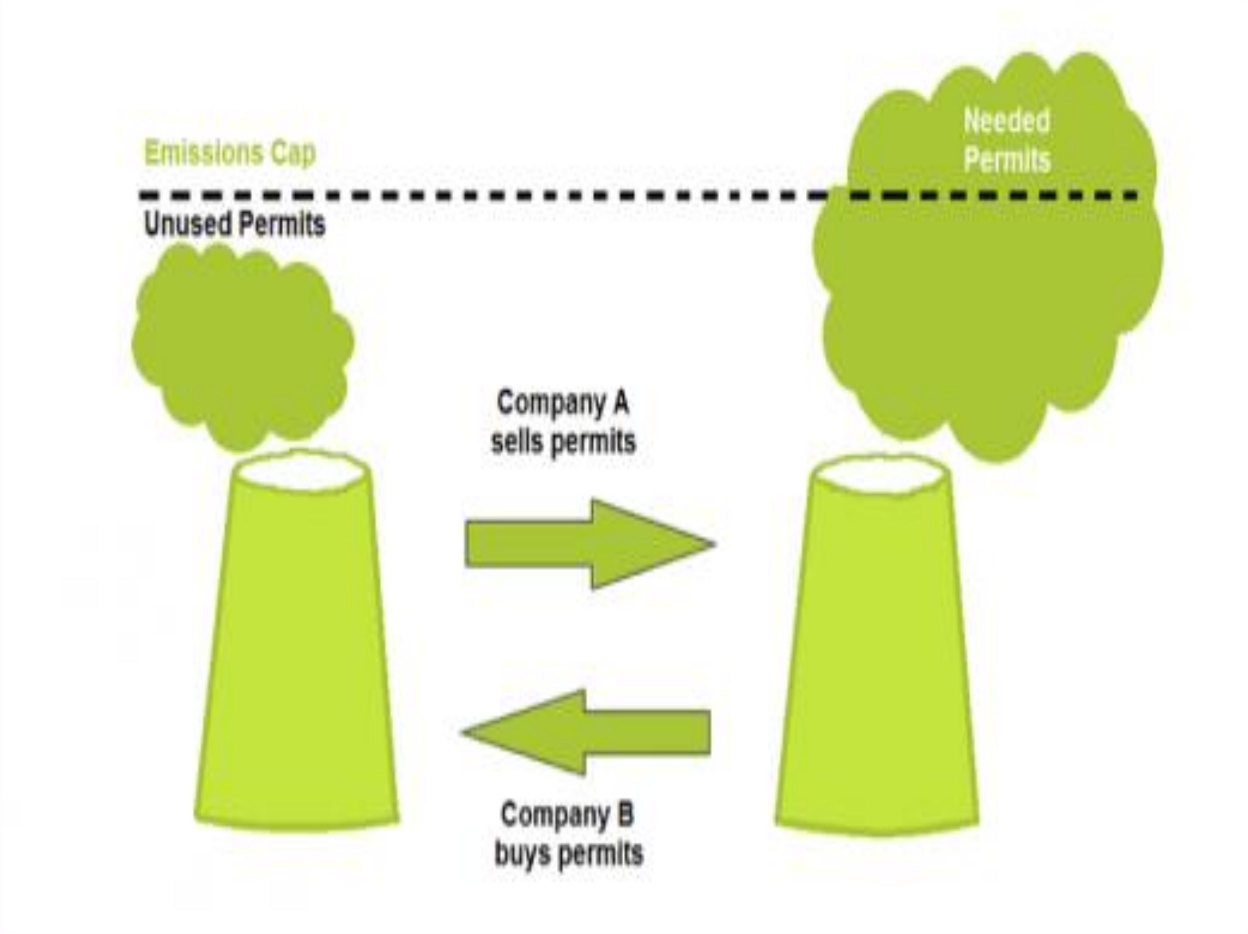
- Social Compensation (to low income countries/households)
- Incentives for EVs
- Investments in charging infrastructure

Member States to submit Social Climate Plans together with National Energy & Climate Plans by 2024

- ***Fit for 55*** : net emissions reductions by 55% by 2030 compared to 1990 levels
- **New EU ETS** to reduce emissions by 61% by 2030, compared to 2005 levels
- New target means steeper annual emissions reduction
- Tighter cap on emissions
- New carbon border adjustment mechanism (CBAM)
- Stronger Market reserve System
- New ETS system to cover:
    - **Maritime** –ships above 5,000 gross tonnage
        - All voyages starting or ending in the EU
        - Ships at berth in EU ports
    - **Road Transport**
        - Regulate fuel suppliers (rather than car drivers)
        - Starting from 2026

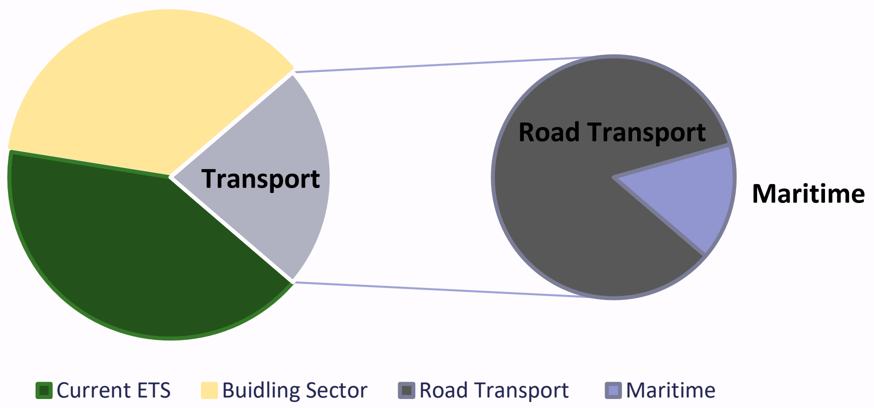
Simple Overview of Emission Trading System (ETS)

- EU Emissions Trading System key pillar of Europe's climate policy, contributing to greenhouse gas (GHG) reduction
  - Sets maximum level of emissions per sector –emission cap
  - Companies gain emission permits – EU emission allowances (EUAs)
  - Companies that emit over the CO_2 emission allowance pay Carbon Tax per excess tonne
  - Or, companies trade EUAs based on price
    - Emitters with less than emission cap can sell EUAs
    - Emitters with more than emission cap can buy EUAs



Why the EU extended ETS to Transport?

Emission Trading System adds Transport (& Building)



- EU ETS only accounted for around **41%** of total EU emissions
- 2021 Mantra: All Carbon Emissions Must be Taxed
- ***"We're putting a price on carbon so people have the incentive to use less carbon and we put a premium on decarbonising so that we stimulate innovation and adaptation," added Frans Timmermans, the European Commission's vice-president in charge of the European Green Deal.***

- Building sector across EU responsible for **36%** GHG emissions
- Transport sector responsible for **23%-27%** emissions (35% when incl. aviation*)
  - Road transport responsible for 70% of total transport emissions
  - Shipping responsible for 13% of EU's GHG emissions
  - MRV (monitoring, reporting, verification) introduced 2018 (1st reporting period) for ships over 5,000 tonnage loading or unloading in European Economic Area (EEA) ports.

2021:
Maritime added to ETS system effective **1 January 2022**, Road Transport set for **2026**

* Aviation part of ETS from 2008

AUTOMOTIVE FROM ULTIMAMEDIA Global. Business. Intelligence.

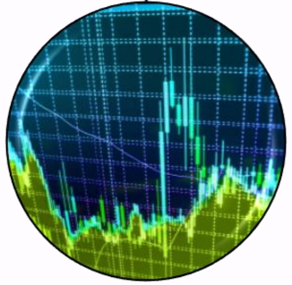
ECG

Carbon Pricing Systems: Cap & Trade

Carbon Pricing

Carbon Tax

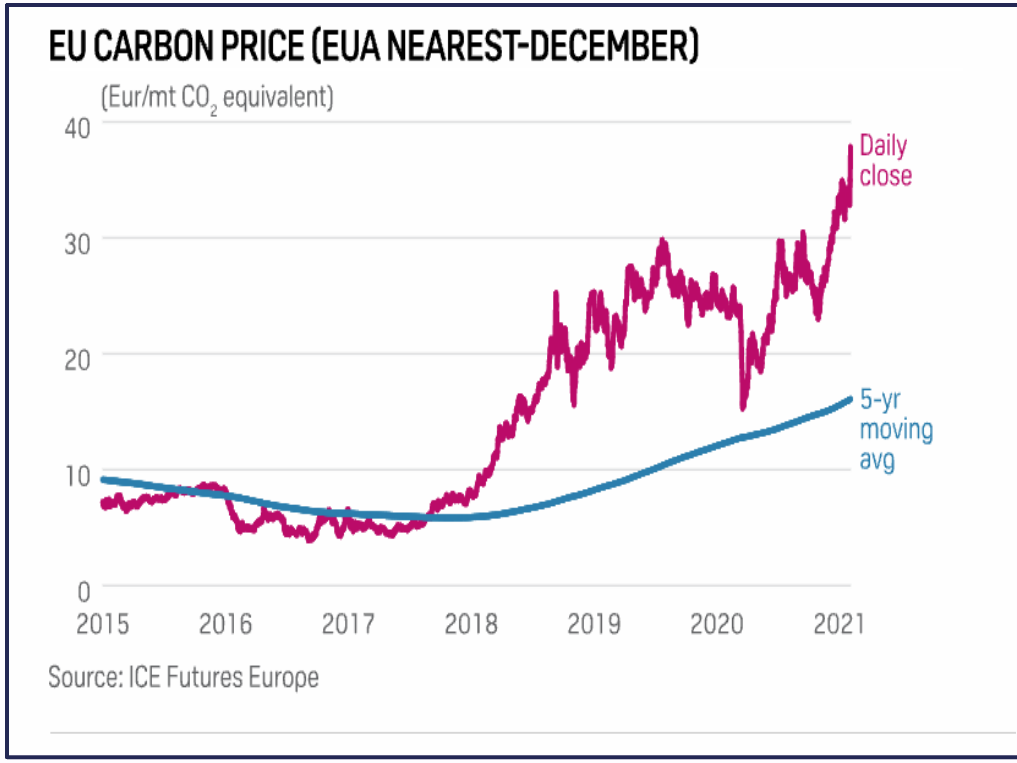
- Creates predictable Carbon Price
- Difficult to estimate amount of emissions that will be reduced



Emission Trading System

- Carbon Price fluctuates as market based instrument
- Certainty on agreed upon emissions reductions trajectory

- ❑ Policy makers set cap per sector
- ❑ Carbon Price per tonne of CO_2 emitted
- ❑ Policy makers set GHG emission caps per sector
  - ❑ mass based cap
  - ❑ rate based cap/intensity based cap



AUTOMOTIVE FROM ULTIMAMEDIA
Global. Business. Intelligence.

02

Terminology

Emission Trading System common terms and what they mean

ETS: Terminology Part 1

EU Emissions Trading System: world's first & biggest major carbon market

- Market Stability Reserve: Surplus of emission allowances accumulated by EU ETS since 2009
- International Credits: financial instruments that represent 1 tonne of CO_2 removed from the atmosphere as a result of an emissions reduction project
- Auctioning: Default method for allocating emission allowances
  - 2013-2020 – estimated 57% of general allowances were auctioned
  - 2021-2030 – estimates that share of allowances to be auctioned remains same at 57%
    - 2% of allowances to be auctioned to establish 'Modernisation' fund

- Kyoto Protocol till 2020
- Clean Development Mechanism (CDM): allows industrialised countries with GHG reduction commitment to invest in projects in developing nations
- Joint Implementation (JI): allows industrialised countries to meet GHG cuts by paying for projects in other industrialised countries

Paris Agreement
COP21 agreement made in 2015, to keep global warming to 1.5°C, 55 countries signed agreement

COP26 Glasgow

AUTOMOTIVE FROM ULTIMAMEDIA Global. Business. Intelligence.

ECG

ETS: Terminology Part 2

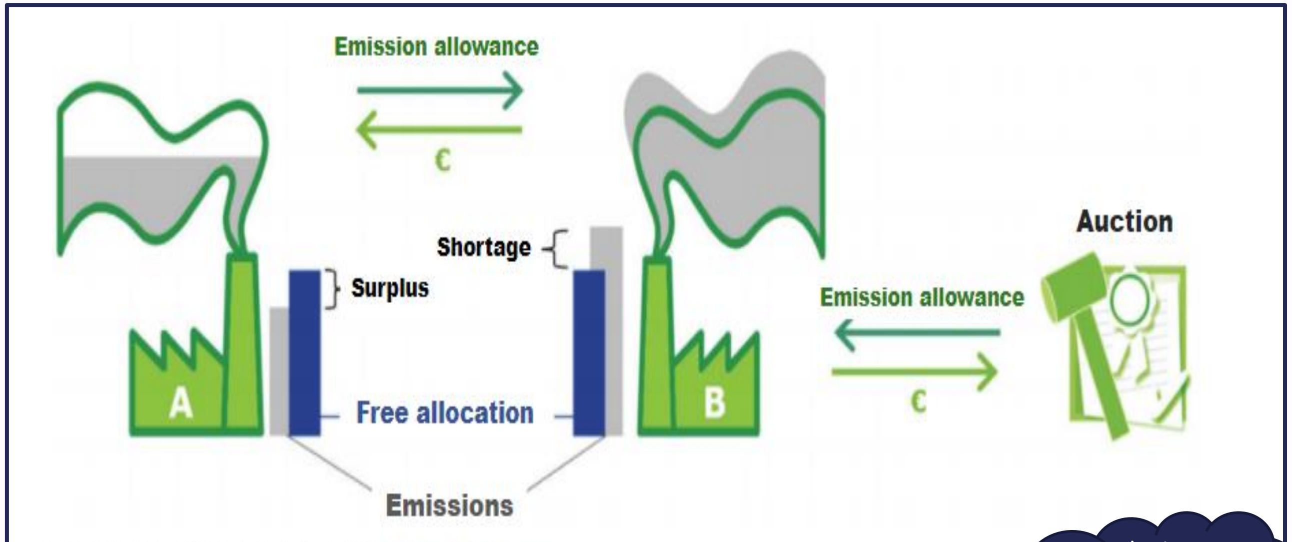
- Registry: centralised EU ETS as an online database which records national implementation measures, companies holding allowances, transfers of allowances 'transactions', annual reconciliation of allowances for verified emissions
- Emissions Cap & Allowances: overall GHG emissions emitted by powerplants, aviation, industry (and now maritime) limited by a 'cap'. Within the 'cap' companies receive or buy emissions allowances and trade when needed. 'Cap' decreases annually.
  - Each allowance gives the holder the right to emit:
    - 1 tonne of CO_2
    - Equivalent amount of nitrous oxide (N_2O) and perfluorocarbons (PFCs)
- Phase 4 (2021-2030) cap on emissions to decrease each year by linear reduction factor of 2.2%
- Stationary installations - EU wide cap for 2021 fixed at 1,571,583,007 allowances
- Annual reduction corresponding to linear reduction factor is 43,003,515
  - So, every year from 2021, emissions cap is reduced by 43 million allowances
  - Note: from 2021 UK no longer part of EU
    - But, UK ETS similar to EU ETS, effective 1 January 2021
    - https://www.gov.uk/government/publications/participating-in-the-uk-ets/participating-in-the-uk-ets

AUTOMOTIVE FROM ULTIMAMEDIA Global. Business. Intelligence.

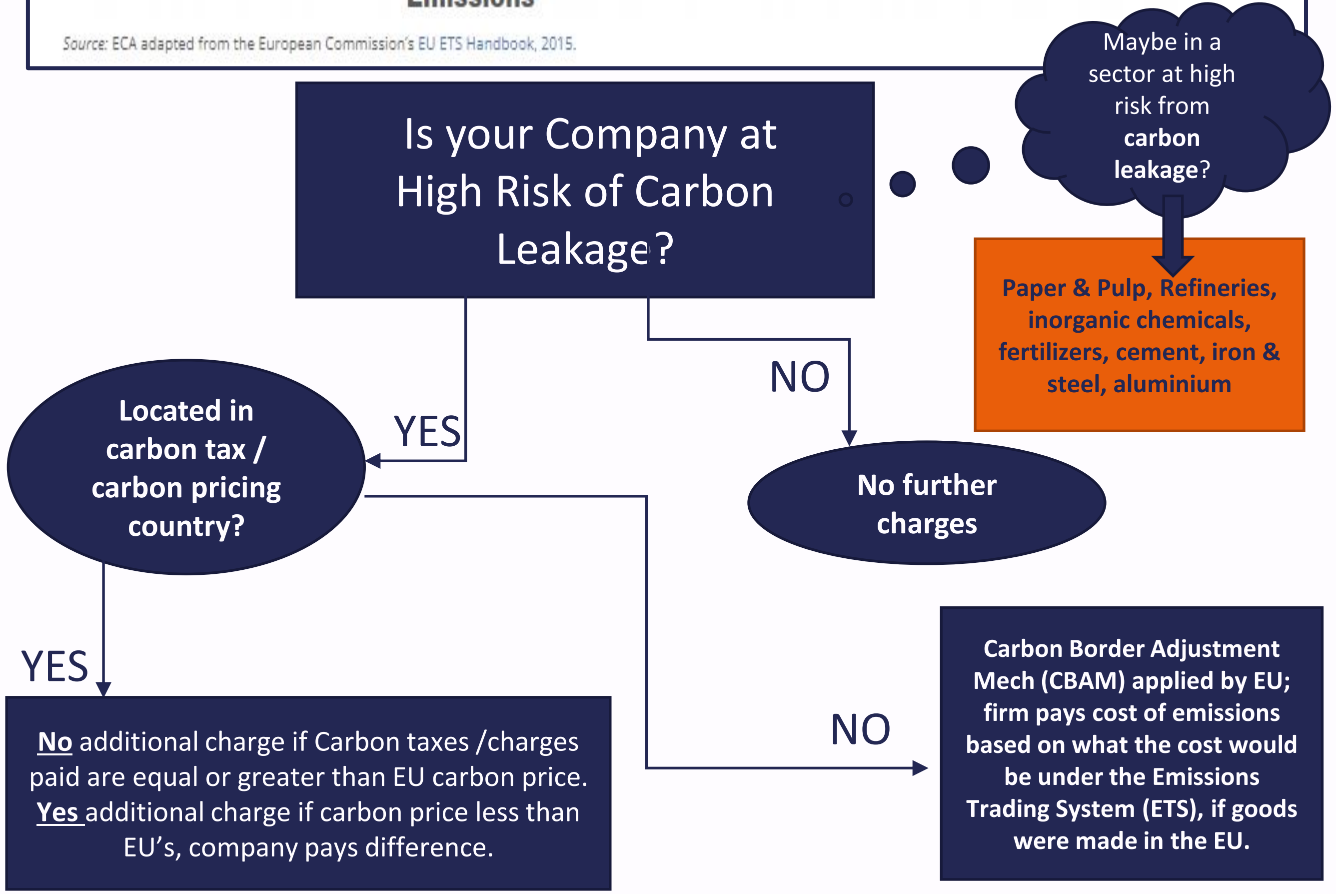
ECG

ETS: Terminology Part 3

- Free Allocation:
  - Industrial installations: manufacturing industries continue to receive a share of emission allowances for free beyond 2020, based on benchmarks.
    - Product benchmarks: based on average GHG emissions of best 10% of the installations (of 52 product industries in EU)
    - One product = one benchmark
- Carbon Leakage: refers to a situation where businesses are able to transfer production to other countries with 'laxer' emission constraints leading to higher total emissions.
  - To avoid carbon leakage the EU ETS allocates higher allowances to those industries with significant risk of carbon leakage—this system continues for 2021-2030.
- CBAM: Carbon Border Adjustment Mechanism - to mitigate 'Carbon Leakages'
  - 2026 CBAM comes into effect
  - CBAM alternative to 'free allocation'
  - CBAM is separate to EU ETS



Source: ECA adapted from the European Commission's EU ETS Handbook, 2015.

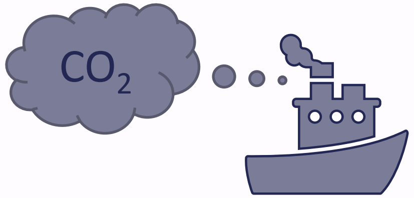


03

2021 brings change …

Emission Trading System to extend to Maritime & Road Transport

2021 brings change….



- **July 2021**: EU ETS proposes to include:
  - Maritime sector – to be included in existing system effective **1 January 2022**
  - Road transport fuels - to be included in new ETS system to regulate fuel suppliers (not drivers)

- **2026**
  - Road transport ETS to be introduced
  - Cap on Emissions set for **2026**
    - Effort Sharing Regulation
    - During the first year, fuel suppliers will be required to hold a greenhouse gas emissions permit and to report their emissions for **2024 and 2025**. The cap in the new ETS will be reduced annually to yield emissions reductions of 61% (up from 43%) in 2030 compared to 2005.

The key 2021 changes are:
•an expansion of the EU ETS to cover **maritime transport**;
•an increase of the linear reduction factor to 4.2% (from previous 2.2%);
•introduction of emissions trading for buildings and **road transport**; and
•confirmation that the normal intake rate for the MSR* at 24% will apply until 2030.
• new EU ETS to include **road transport** from 2026, based on 2024 & 2025 GHG emissions

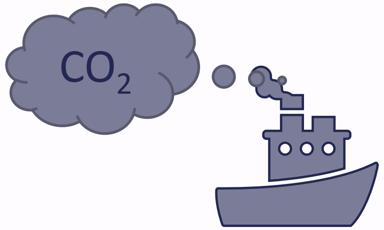
AUTOMOTIVE FROM ULTIMAMEDIA Global.Business.Intelligence.

* Market Stability Reserve

ECG

ETS & Carbon Taxes to create 'Social Climate Fund'

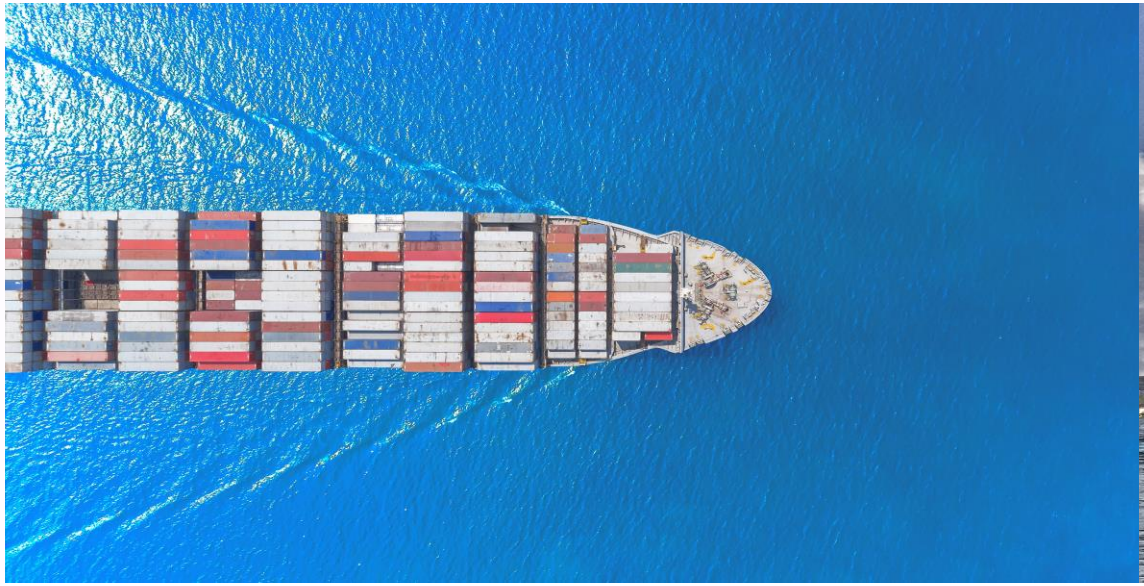
- Grant support to vulnerable, micro enterprises, transport users
- 25% of revenue from ETS to fund Social Climate Fund
- €72.2 billion for period 2025-2032



Maritime ETS

- Maritime ETS applicable to:
  - Large ships, above 5,000 gross tonnage
  - All such ships that call at an EU port for voyages within the EU (intra-EU)
  - 50% of emissions from voyages starting or ending outside of the EU (extra-EU voyages)
  - Emissions that occur when ships are at berth in EU ports

- How will this work?
  - Shipping companies to purchase ETS emission allowances per tonne of CO_2 emissions
  - Administration to be dealt by Member State
  - EU ETS rules & penalties apply, ships can be denied entry to EU ports if company fails to comply for 2 consecutive years
  - EU Monitoring, Reporting & Verification System for Shipping to track CO_2 emissions from ships



EU ETS Directives for Maritime Transport

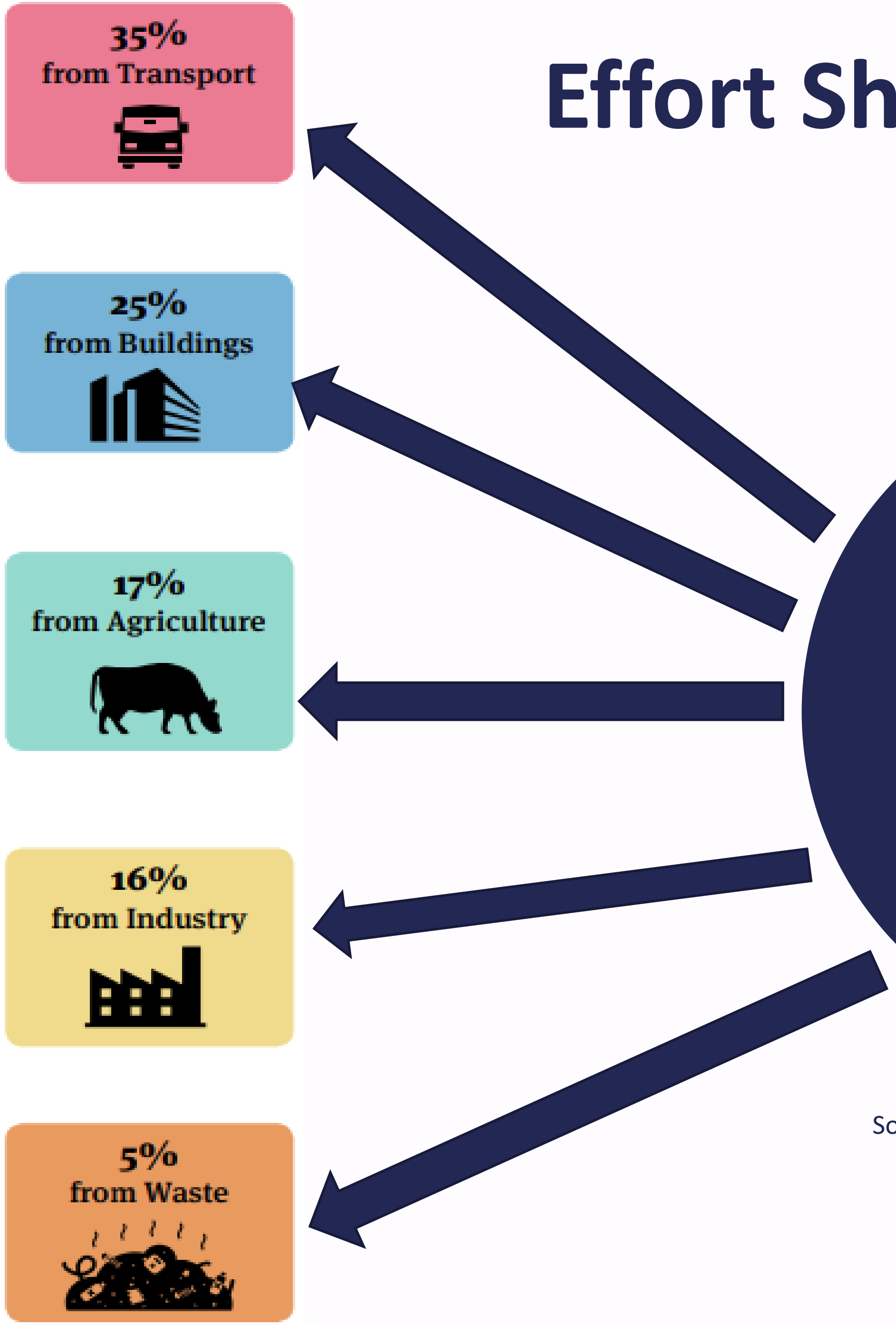
- 2018 –MRV (Monitoring, Reporting, Verification) regulation for ships over 5,000 tonnage to report CO_2
  - MRV when ships unloading cargo, passengers at EU/EEA ports
- 2021 –MRV (Monitoring, Reporting, Verification) regulation for ships over 5,000 tonnage to report CO_2
  - MRV for ships on **intra-EU journeys** (within EU)
  - MRV for ships from **extra-EU journeys** (half journey)
  - MRV for ships at berth in EU ports

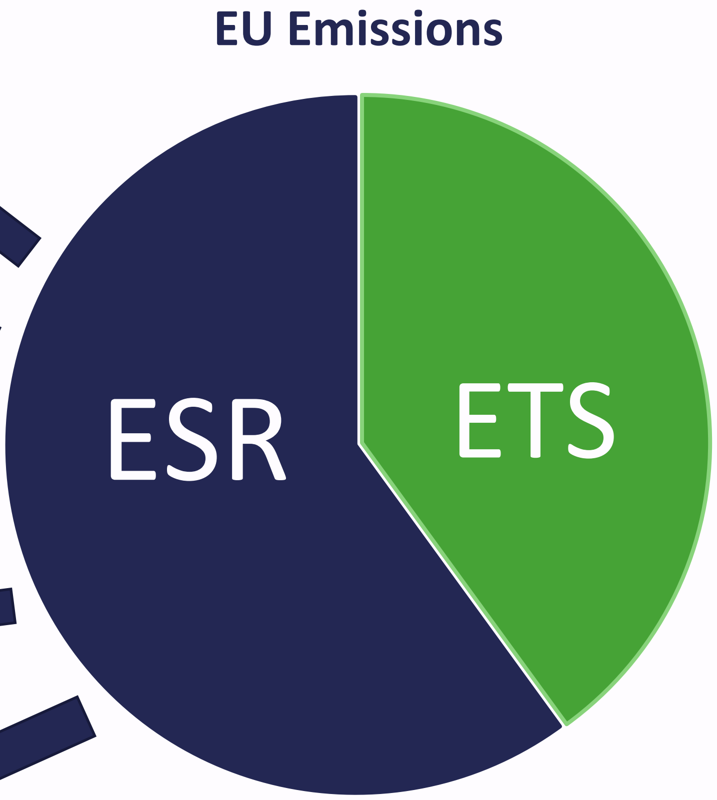
- Shipping companies to surrender 100% of verified emissions from 2026 following phased in process:

Year	Surrender Allowances on verified emissions
2023	20%
2024	45%
2025	70%
2026 onwards	100%

Failure to comply for 2 consecutive years results in penalties: prevent entry of ship into EU port, ship detained

Effort Sharing Regulation (ESR)





Source: Effort Sharing, Carbon Market Watch, 2017

- ESR covers sectors not included in Emission Trading System (ETS)
- ESR regulates 60% of GHG emissions in the EU

Transport (& buildings) to Move to ETS

- From 2021 –Shipping to use MRV* to prepare to join ETS
- From 2026 -- Road Transport to be part of 'New' ETS

- *MRV: Monitoring, Reporting & Verification

Road Transport ETS is ESR

Road Transport (& housing) different system

- Effort Sharing Regulation (ESR): sets national targets based on GDP per capita
- Separate Emission Trading Scheme for road transport & housing
  - Regulated entities will need greenhouse gas emission permits for 2024 & 2025
  - From 2026 road transport (& housing) will have obligation to surrender allowances
  - Allowances can be 'auctioned' if no free allocation
  - Exceptions: release for consumption of fuels where emissions are zero
  - From 1 January 2027: EU Member States will, by 30 April each year, insist regulated entity 'surrenders' volume of allowances equal to total emissions in previous year, such that those allowances are cancelled
  - Road Transport ETS accompanies revised CO_2 emissions regulations for cars & vans

ETS (ESR) for Road: Facts & Fixes

- Market Stability Reserve (MSR) 2019
  - Instrument that allows authorities to increase & decrease number of CO_2 permits in market
  - Why? In 2014 scheme had to reduce surplus of about 2 billion allowances, and removed 900 million permits from market under instrument called ‘backloading’, thus in 2019 MSR was brought in as a ‘fix’.

  CBAM: No free allocation given to avoid carbon leakage

  ESR: Effort Sharing Regulation sets binding annual targets for Member States to be achieved by 2030, includes road transport sector

- Fuel Producing Companies:
  - Amount of CO_2 content of fuel that a fuel producing company wants to sell (a)
  - Company needs to get CO_2 Emission Trading Certificate / European Emission Allowance (EUA) per ‘tonne of CO_2’
  - Fine is €100 PER EXCESS TONNE
- Vehicle Manufacturers (OEMs):
  - OEM needs CO_2 Emission Trading Certificate for volume of vehicles for sale
  - ETC based on CO_2 emissions per kilometre of the vehicle
  - Cost of certificates added to cost of car/truck

> “ETS is just another excuse for governments to collect taxes and will not reduce CO_2 emissions. As such it is just another penalty on road transport and therefore a penalty on the economy as a whole,” IRU International Road Transport Union

Quick Overview: Caps, Fines, Funds

- CAPS:
  - Maritime: linear reduction increased to 4.2% from 2.2%
  - One-off downward adjustment of cap applicable for 2021
    - Based on MRV system for 2018 & 2019 then downward adjusted for 2021
- Funds & Fines:
  - 2% increased to 2.5% to support Modernisation Fund for Member States with GDP lower than 65% of EU average (like Cohesion countries)
  - Reward system for installations that meet benchmark - gain allowances to meet emissions
  - EU ETS will cover two thirds of maritime transport (90 million tonnes CO_2)
  - Shipping owners will have to purchase ETS emission allowances for each tonne of reported CO_2
  - In addition to penalties, ships can be denied entry to EU ports if 2 consecutive years of failure to comply

- Free allocation: made on decarbonisation efforts
  - Installations NOT implementing measures recommended will have free allowances cut by 25%
- Effort Sharing Regulation: annual emissions budget for each Member State towards 2030 targets, mainly for non-ETS sectors
- CBAM: Carbon Border Adjustment Mechanism-to mitigate ‘Carbon Leakages’
  - 2026 CBAM comes into effect
  - CBAM alternative to ‘free allocation’
  - CBAM is separate to EU ETS
- EU ETS for transport: initial 2025
  - Cap on Emissions from 2026
  - Aim to reduce emissions by 61% (was 43%) by 2030 compared to 2005
  - 25% of revenue to go to Social Climate Fund

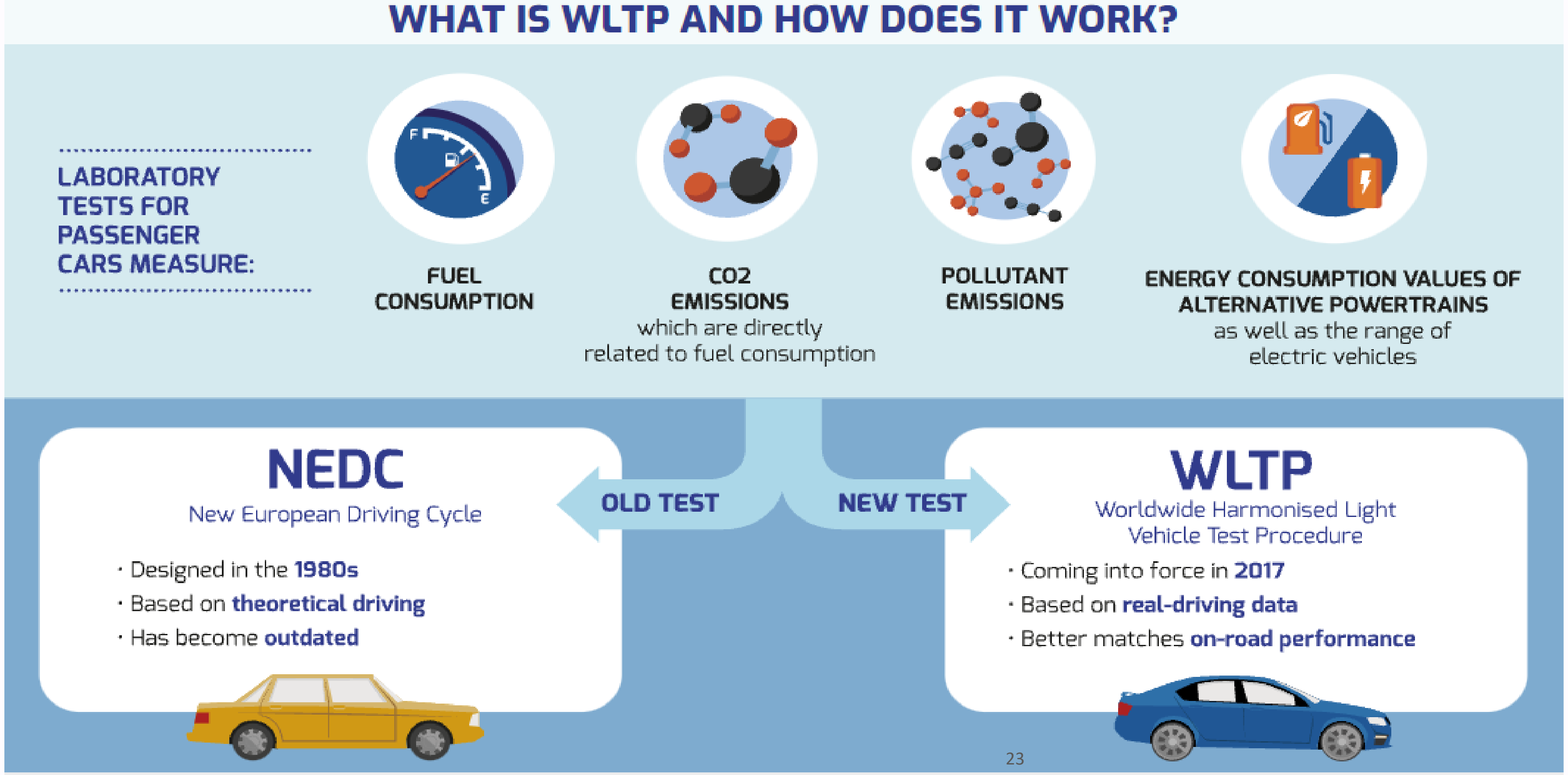
04

Car & Van market

How Carbon Taxes hit light vehicle market

Car & Van market Emission Performance Standards

- Passenger cars and light commercial vehicles responsible for 12% and 2.5% respectively of EU emissions of CO_2
- Regulation sets EU fleet wide CO_2 emission targets applying from 2020, 2025 and 2030
- From 2021 emission targets for manufacturers will be based on WLTP emission test procedures – based on real driving data
- Previously targets were based on NEDC – based on 'theoretical' driving, lab based



Clean Air For Europe (CAFE) mandate

EU CO_2 Emissions Targets	2015-2019	2020-2024	2025-2029	2030
Passenger Car	130gCO_2/km	95 gCO_2/km	80.8 gCO_2/km	59.4 gCO_2/km
Light Commercial Vehicle	175 gCO_2/km	147 gCO_2/km	132 gCO_2/km	116 gCO_2/km

Source: European Commission

- Fine: €95 per gram of CO_2 over the limit
- Heavy fines aim to deter OEMs from producing ICEs
- EU introducing carbon border adjustment mechanism, to address carbon leakage
- 2019: Average passenger car CO_2 emissions hit 122.3 grams per km (gCO_2/km)- EEA

2021 CO2 targets would generate €34 billion euros in penalty payments within Europe
JATO

Most car makers will avoid EU emission fines
FleetNews

Pooling to offset CO_2 emission fines

Carmakers Face Billions in European CO2 Fines from 2021

"Only four out of 11 carmakers are forecast to meet the EU 2021 CO2 emission target, with the rest facing significant fines," a new study shows.
Agence France-Presse

"We narrowly missed the fleet target for 2020, thwarted by the Covid-19 pandemic. Along with Volkswagen Passenger Cars and Audi, CUPRA and ŠKODA are now bringing out further attractive electric models. This will allow us to achieve our fleet target this year." Herbert Diess, CEO of the Volkswagen Group, January 2021.

Surge in EV sales reduces expected fines.

OEMs face uphill battle on CO2 targets in 2021
JUST AUTO

Pooling

- A pooling agreement may be formed:
  - Between manufacturers of the same category of vehicles (i.e. either between manufacturers of passenger cars or between manufacturers of light commercial vehicles).
  - A pool is considered as one manufacturer for the purpose of compliance with a specific CO_2 emissions target.
  - Each year, the Commission will calculate the specific emissions target of the pool on the basis of the average mass of all new vehicles of the members of the pool, that have been registered in the EU, Norway and Iceland in that calendar year. The average specific emissions of CO_2 of those vehicles must not exceed that target.
  - A manufacturer can only be a member of one pool in a given calendar year.
  - For each pool, a pool manager must be nominated. The pool manager should be a representative of one of the pool members.
  - Types of pools:
    - a) **Closed pools** : a closed pool is formed solely by manufacturers that are part of a group of connected undertakings
    - b) **Open pools** : these are pools where at least one pool member is not part of the same group of connected undertakings as the other members.

Pools - 2021

Pool Manager	Pool members	Duration
Toyota Motor Europe	Mazda Motor Corp., Mazda Motor Logistics Europe NV, Subaru Corp., Suzuki Motor Corp., Magyar Suzuki Corp., Toyota Motor Europe SA., Toyota Gazoo Racing Europe GMBH.	2021
Tesla Inc	Honda Motor Co., Jaguar Land Rover Ltd., Tesla Inc.	2021
Renault SAS	Automobile Dacia SA, Mitsubishi Motors Corp., Mitsubishi Motors (Thailand) Co Ltd., Nissan Automotive Europe SA, Renault SAS, Societies Des Automobiles Alpine SAS.	2021
Volvo Cars	Volvo Cars, Polestar Performance AB.	2021
Volkswagen AG	Audi AG, Audi Hungaria AG, Audi Sport GMBH, Bugatti Automobiles SAS, Dr ING HCF Porsche, SEAT SA, Skoda Auto AS, Volkswagen AG, SAIC Motor Europe BV, MG Motor UK Ltd.	2020-2022

05

Outcomes & Conclusion

Developments from 2021

COP26 Developments

Eliminate Emissions by 2040 –COP26 OEMs that signed agreement	OEMs that DID NOT sign agreement at COP26
General Motors	BMW
Ford	Volkswagen
Mercedes-Benz	Renault
Volvo	Hyundai
BYD	Stellantis
Etrio Automobiles	Toyota
Avera Electric Vehicles	
Quantum Motors	
Mobi	
Gayam Motor Works	

2030: 30% MHCV to be Zero Emission 2040: 100% MHCV to be Zero Emission Countries that signed agreement	Countries that DID NOT sign agreement
Austria	United States
Denmark	China
Finland	Japan
Netherlands	Germany
Norway	France
Scotland	Belgium
United Kingdom	
Turkey	
Chile	
Canada	
Uruguay	
New Zealand	

More Signatures required

If you are a ship owner ….

- **EU Emissions Trading System effective**
  - **1 January 2022**
- **Amendments to EU Monitoring, Reporting, Verification (MRV) & EU Directive's Allowances**
- **Additional monitoring and reporting requirements to IMO Data Collection System (DCS)**
- **Carbon Trading in Maritime both a cost and an opportunity**
- **Fines: €100 per tonne of excess CO_2 above allowance**

- Ship owner responsible for acquiring & surrendering emission allowances (EUAs)
- Obligations to surrender allowances to be gradually phased in:
  - 20% of 2023 emissions
  - 100% of 2026 emissions

  Operators should consider cost implications from January 2022.
- Paperwork needed:
  - GHG permit
  - Registry account
  - Clearing house
  - Intermediate contract
  - Projection of EUA prices, carbon prices to estimate compliance costs

- No 'free allowances' for shipowners
- Example: South Africa (Richard's Bay) to Rotterdam, purchasing cost of EUAs approx. €50-55,000 per voyage
- If EUAs are not purchased, then fine €100/t of CO_2
- Compliance could mean 'partnership'
  - Finding a reliable partner in the carbon market reduces financial risk
  - Ship owners can then trade/ purchase necessary carbon credits to offset CO_2 emissions.

AUTOMOTIVE FROM ULTIMAMEDIA Global. Business. Intelligence.

ECG

If you are a road transporter…

- Effort Sharing Regulation (ESR) –binding targets to be achieved by Member States by 2030 (covers non-ETS sectors such as buildings and road transport).
  - 1 January 2026: New EU ETS system effective (to include road transport & buildings in the future)
  - Separate stand-alone system effective monitoring from 2024, 2025 for 2026
    - During 1st year (2026) regulated entities required to hold GHG emissions permit
    - Report GHG emissions for years 2024 & 2025
      - (Tip: Start monitoring total emissions for compliance analysis from 2022/2023)
    - Issue is large number of small emitters, thus further upstream targeted ie fuel suppliers
    - 2028 quantity of allowances allocated on available MRV data for 2024-2026 from ESR
    - All new emissions trading will be 'auctioned', no free allocation foreseen
    - To ensure market stability a Market Stability Reserve will be implemented

- 150 million allowances to be issued under New ETS for road transport & buildings to the Innovation Fund
- 1 January 2028 - proposed review of effectiveness of New ETS.
- Liquidity in market to be maintained by allocating 20% higher auction volumes than total quantity of allowances in 2026
  - 600 million allowances for emission trading in road transport & buildings for reserve
- Member States to spend all the auction revenues from carbon trading on climate and energy related purposes to address concerns in road transport and buildings, 50% for low income households.

In a nutshell: Road Transport regulated by Effort Sharing Regulations till New Emission Trading System effective 1 January 2026

06

Credits & Contacts

For more details, contact:

Mike Sturgeon
Director, ECG Association
Mike.Sturgeon@ecgassociation.eu

Christopher Ludwig
Editor-In-Chief, Ultima Media
Christopher.Ludwig@ultimamedia.com

Namrita Chow
Automotive Analyst, Ultima Media
Namrita.Chow@ultimamedia.com

Daniel Harrison
Automotive Analyst, Ultima Media
Daniel.Harrison@ultimamedia.com

More research can be found at: ecgassociation.eu/ecg-business-intelligence

ECG