Africa Energy Efficiency Policy in Emerging Economies Training Week

Transport

Nairobi
18-21 March 2024

International Energy Agency

Review: What we learnt yesterday and questions

Alison Pridmore, Ian Skinner

Review

Please answer one (or more) of the following:

- What did you find most interesting from the sessions yesterday?
- What was the biggest surprise?
- What could you take forward in your work?

- Any questions / or reflections

Format of the day

Day 1 Agenda	
9:00 - 09:30	Review what we learnt yesterday and questions
09:30 - 10:30	4.Making it Happen: the Role of Regulation
10:30 - 11:00	Coffee and Tea Break
11:00 - 12:30	5. The Role of Regulation for Vehicle Imports
12:30 - 13:30	Lunch
13:30 - 14:30	5. Making it Happen: Information
14:30 - 15:30	6. Making it Happen: Incentives
15:30 - 16:30	Coffee and Tea Break
16:30 - 17:30	Group Exercise

Africa Energy Efficiency Policy in Emerging Economies Training Week

Transport

Nairobi
18-21 March 2024

International Energy Agency

Transport: Making it happen – The role of Regulation in improving energy efficiency Day 2, 19 March 2024

Dr Ian Skinner, Director/Transport and Environmental Policy Research

Training roadmap

Overview

Role of regulation in improving energy efficiency

Role of regulation in support of electro-mobility

Role of regulation in improving energy efficiency: Fuel economy standards

Enhancing effectiveness: Fuel economy standards and fiscal incentives

Main messages and resources

Learning outcomes

- This session will focus on developing your capabilities to:

  - Understand the role of different types of regulation in improving energy efficiency within a policy package approach

  - Recognise the role of different types of regulation in supporting the deployment of electric vehicles

  - Understand the potential development of fuel economy standards

Role of regulation in improving energy efficiency

Regulation at the National level

Regulation to improve the fuel efficiency of vehicles is a national role supported by state/city measures. The development of fuel economy standards, e.g. by increasing their stringency, can support the delivery of national GHG reduction targets. Regulation can also help ensure required infrastructure.

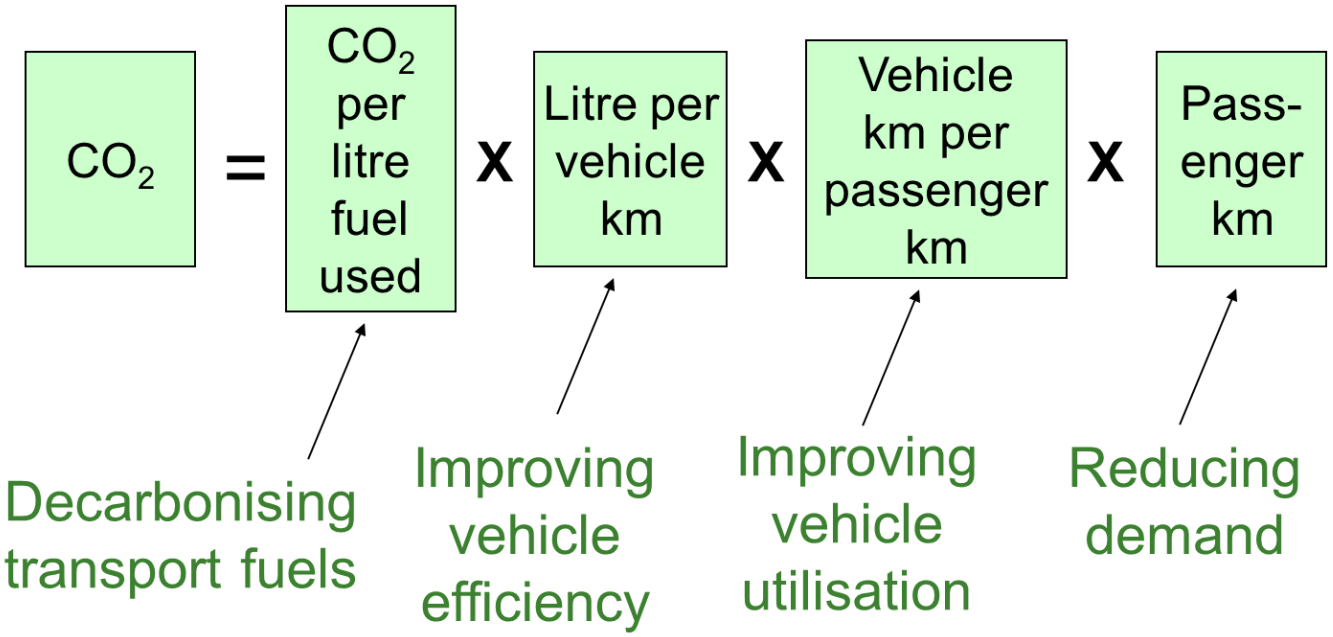
Role of regulation in states and cities

While national governments set the regulatory framework, states and cities can support the deployment of electric vehicles (EVs), e.g. through regulatory/market signals (e.g. targets) and regulation for EV charging infrastructure. Regional and city regulation can also improve transport's energy efficiency, e.g. support for public transport and planning policy.

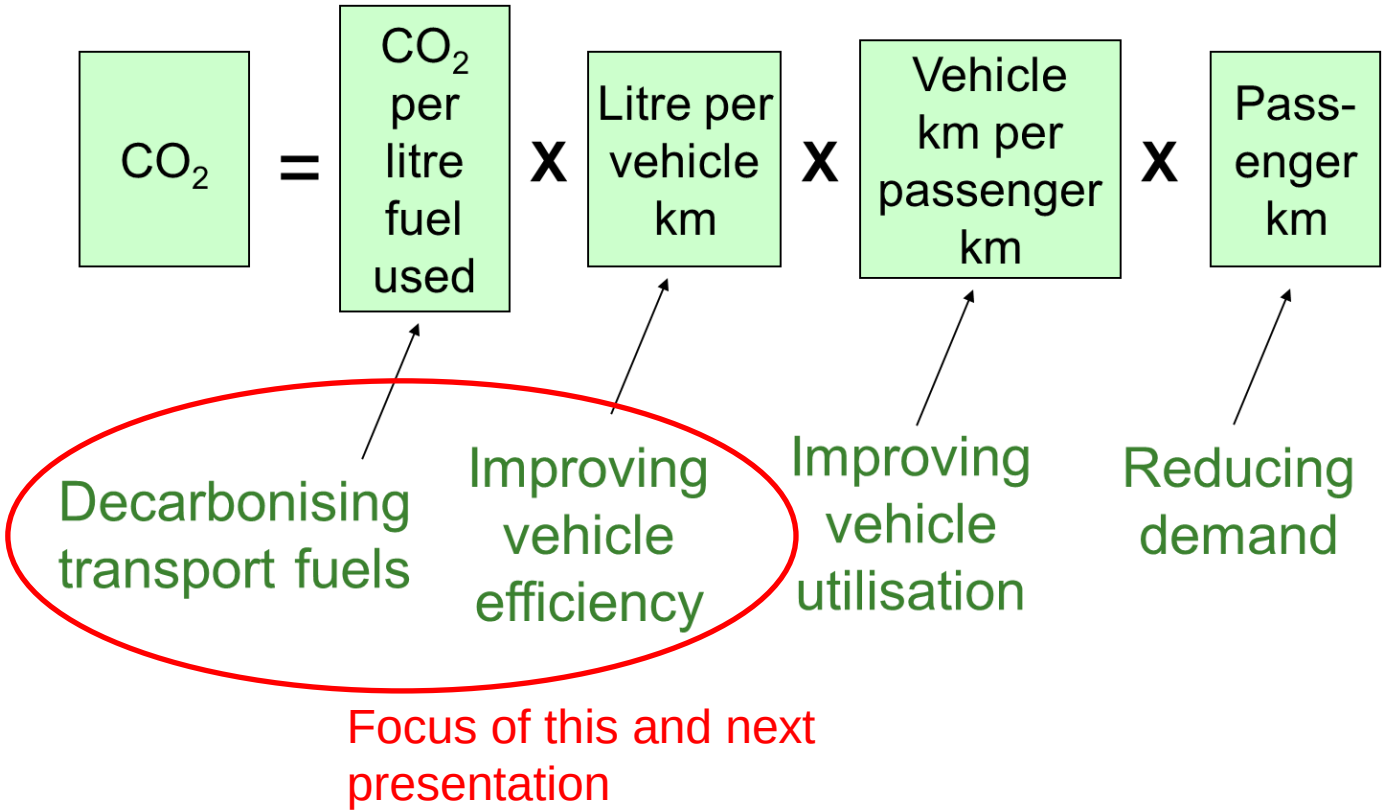
REGULATION

- **National Governments help create the environment** for cities to take action through setting an overall vision including plans and targets.
- **Local regulations and codes** incorporating solutions such as smart data and metering help unlock system wide efficiencies.
- **Planning** should be integrated and cross sectoral, taking a long term view.
- **International standards and benchmarks** are important in enabling seamless communication across technologies and applications, critical for efficient urban energy systems.
- **National action that facilitates business models** for clean urban energy services, such as Public Private Partnerships and ESCOs, unlock new sources of finance.

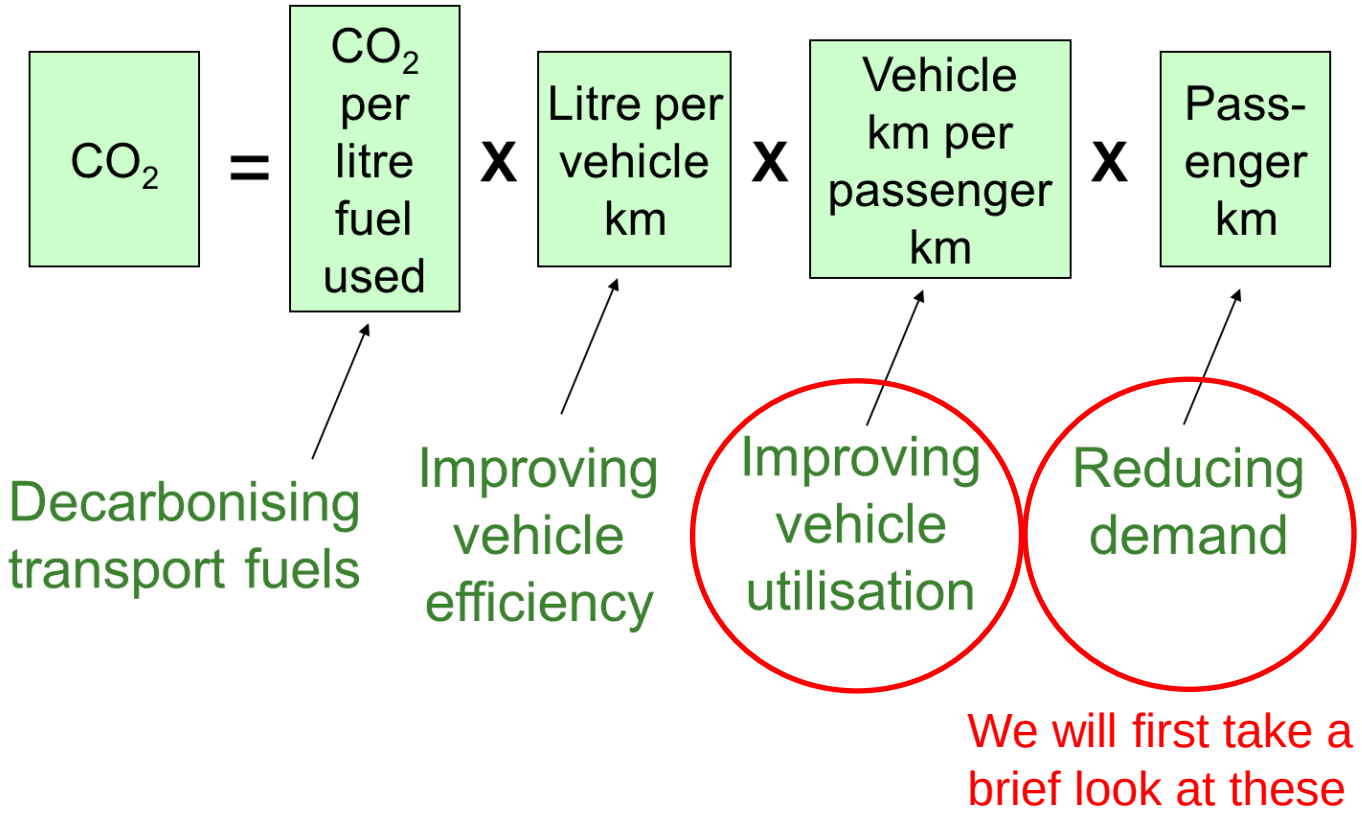
What might we regulate to improve the efficiency of transport?



What might we regulate to improve the efficiency of transport?



What might we regulate to improve the efficiency of transport?



Regulation to improve utilisation

- Can be seen from different perspectives, e.g.:
  - Regulation to increase the number of people in cars, e.g. High Occupancy Vehicle Lanes (US), car-pooling
  - Regulation to increase efficiency road use, e.g. speed limit optimisation (also to optimise fuel use in vehicles)
  - Regulation to improve utilisation of urban space, e.g. support to public transport, cycling, walking
  - Regulation to make car use more difficult, e.g. parking policy, access restrictions, vehicle registration caps

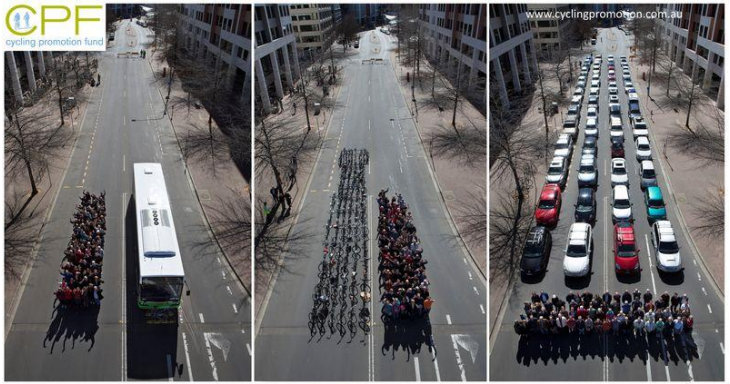


Image source: Cycling Promotion Fund, Australia

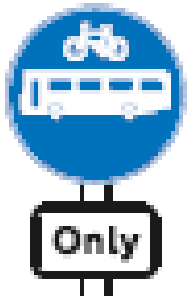


Image source: UK Highway code

- Regulation in support of public transport could include:
  - Investment in public transport services, vehicles
  - Bus rapid transit / bus lanes / bus priority
  - Access restrictions / congestion charging
  - Re-prioritisation of road space
  - Modal integration

Other regulation to improve energy efficiency / reduce CO_2 emissions

- Regulation to improve environmental performance of the vehicle fleet, such as:
  - Regular vehicle testing to ensure vehicles are not over-polluting (and are roadworthy)
  - Scrapping of vehicles that fail tests / are over a certain age (supported by incentives)
  - Regulating used vehicle imports – subject of later session

- Regulation to reduce demand, e.g.:
  - Planning policy
  - Transit-oriented development
  - 15-minute cities
  - Travel demand management

- Regulation in support of more efficient/sustainable fuels, e.g. blending mandates, regulation of carbon content and sustainability of fuels

Photos: iStock

Role of regulation in support of electro-mobility

National policy frameworks to support electro-mobility

- National policy frameworks can help to ensure that a comprehensive and complementary package of measures to promote electro-mobility is put in place

- National frameworks can include targets (for deployment of vehicles and infrastructure), procurement obligations and complementary regulation, as well as incentives and awareness campaigns

- Strategic electro-mobility policy documents have been adopted in a number of African countries, such as:
  - Cabo Verde's Electric Mobility Policy Charter (2019)
  - Rwanda's Strategic Paper on e-mobility (2022)
  - Ghana's National Electric Mobility Roadmap (2022)

EV sales targets in place in a number of African countries

- Ethiopia aims to incorporate 148,000 small EVs and 4,850 electric buses into its vehicle fleet by 2030
- Nigeria's vision is to have 60% of passenger vehicles electric, and 20% hybrid, by 2050; with all being EVs by 2060
- Ghana has set target for sales of cars and buses that should be electric (starting from 4% in 2025, rising to 32% in 2050)
- Rwanda has set targets to introduce electric vehicles; by 2030, 8% of cars, 20% of buses and 30% motorcycles will be electrified
- Cabo Verde has targets (for each road vehicle category) for new vehicles that should be electric (from 2021) to reach 100% by 2035
- By 2025, Kenya wants to increase share of imported cars that are electric to 5%

Photo iStock

Integrating EV targets into public procurement

- Setting public procurement targets for EVs helps to:
  - Create a market in the country
  - Demonstrate leadership by public authorities
  - Can help to reduce costs through improved economies of scale

- Several African countries have, or are considering, such targets, e.g.:
  - Cabo Verde has an:
    - Obligation on public transport companies from 2025 to purchase a minimum share of EVs (50% in 2025; rising to 100% by 2035)
    - Targets for procurement of EVs in Government's fleet (20% in 2019, rising to 100% by 2025); whole fleet to be 100% EV by 2030
  - Rwanda has plans to give preference to EVs for Government vehicles
  - Nigeria is reportedly considering mandates on government to purchase EVs, as part of an Electric Vehicle Development Plan

Photo: Ian Skinner

Setting targets for installation of EV recharging infrastructure

- Setting targets for EV infrastructure deployment is important to:
  - Send a signal to the market in the country
  - Ensure that sufficient infrastructure is available
  - Give confidence to potential EV owners that they'll be able to recharge their vehicles

- EV installation targets exist in a number of African countries, e.g.:
  - Ethiopia is considering developing a plan to support EV introduction for all modes and a plan to develop charging infrastructure nationwide
  - Rwanda has set targets to construct EV charging stations
  - Kenya's E-mobility and battery swapping guidelines (2023) state that there should be one EV charging station in each 3 km by 3 km grid and one every 25 km, and a fast-charging infrastructure every 100 km, on roads and highways (on each side)
  - Cabo Verde is developing a public network of National Recharge Infrastructure; aims to have this in main urban centres and on strategic road network by 2025; complete by 2030

Photo: iStock

Complementary regulatory policies for electro-mobility

- Changes to building code can also help to ensure that EV charging infrastructure is installed in private parking spaces, e.g.
  - Kenya's revised Building Code (2022) requires owners of commercial buildings to dedicate at least 5% of car parking spaces to EV charging
  - Rwanda has plans to include provisions on EV charging in building code and city planning rules

- Other complementary policies can help to increase awareness of EVs and to give EV owners other benefits, e.g.:
  - Rwanda is considering the introduction of a green license plate for EVs to give them preferential parking treatment, access to congested zones and use of bus lanes

Images: iStock and UK Government

Role of regulation in improving energy efficiency: Fuel economy standards

Fuel economy (FE) standards, important element of a policy package

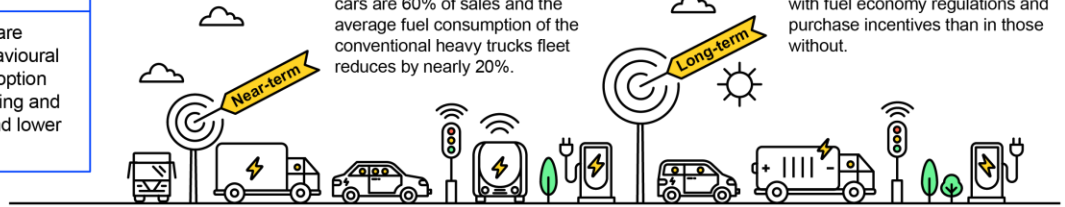
Policy Package – Vehicle Energy efficiency

Immediate opportunities

Significant fuel savings are achievable through behavioural actions including the adoption of best practices for driving and vehicle maintenance, and lower speeds.

In the IEA Net Zero Scenario milestones for 2030, electric cars are 60% of sales and the average fuel consumption of the conventional heavy trucks fleet reduces by nearly 20%.

Efficiency improvement rates for cars are 60% faster in countries with fuel economy regulations and purchase incentives than in those without.



REGULATION

- **Vehicle fuel economy standards** result in greatly reduced fuel use provided they are kept up to date, well monitored and properly enforced.
- **Regulating the import and export of used vehicles** can help improve fleet fuel economy and ensure road safety and air quality benefits.
- **Regulatory and market signals**, such as through stringent standards and target setting, help bring electric vehicles to the market, by providing an impetus to manufacturers to develop these technologies.
- **Regulation** can also help ensure the required infrastructure, for example standardised charging, is in place.

INFORMATION

- **Information campaigns** on carsharing practices and more fuel-efficient driving help people take informed action relating to energy and cost savings. Campaigns are more effective when based on behavioural insights and targeted strategies.
- **Labels inform consumers**, identifying the most efficient vehicles allowing people to choose vehicles that cost less to run. Labels for new and used vehicles help ensure benefits for all vehicle purchasers.

INCENTIVES

- **Incentives** can make vehicle costs cheaper at point of purchase, such as through grants or lower registration fees. They can also reduce on-going costs, through for example free parking and exemptions from congestion tolls.
- **Government grants** for strategic charging infrastructure, such as charging stations in homes and workplaces or fast charging along expressways, encourage the adoption of electric vehicles reflecting that purchase decisions are influenced by the availability of infrastructure.
- **Such incentives** facilitate the early adoption of electric vehicles and can be phased out as uptake grows.
- **Vehicle taxation and duties**, can be structured to incentivise the purchase of more efficient vehicles.

Fuel economy (FE) standards, important element of a policy package

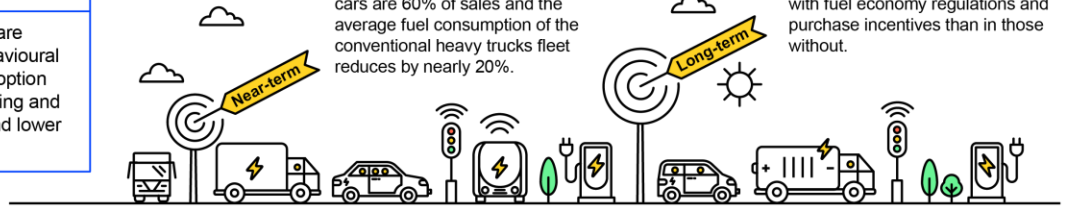
Policy Package – Vehicle Energy efficiency

Immediate opportunities

Significant fuel savings are achievable through behavioural actions including the adoption of best practices for driving and vehicle maintenance, and lower speeds.

In the IEA Net Zero Scenario milestones for 2030, electric cars are 60% of sales and the average fuel consumption of the conventional heavy trucks fleet reduces by nearly 20%.

Efficiency improvement rates for cars are 60% faster in countries with fuel economy regulations and purchase incentives than in those without.



REGULATION

- **Vehicle fuel economy standards** result in greatly reduced fuel use provided they are kept up to date, well monitored and properly enforced.
- **Regulating the import and export of used vehicles** can help improve fleet fuel economy and ensure road safety and air quality benefits.
- **Regulatory and market signals**, such as through stringent standards and target setting, help bring electric vehicles to the market, by providing an impetus to manufacturers to develop these technologies.
- **Regulation** can also help ensure the required infrastructure, for example standardised charging, is in place.

INFORMATION

- **Information campaigns** on carsharing practices and more fuel-efficient driving help people take informed action relating to energy and cost savings. Campaigns are more effective when based on behavioural insights and targeted strategies.
- **Labels inform consumers**, identifying the most efficient vehicles allowing people to choose vehicles that cost less to run. Labels for new and used vehicles help ensure benefits for all vehicle purchasers.

INCENTIVES

- **Incentives** can make vehicle costs cheaper at point of purchase, such as through grants or lower registration fees. They can also reduce on-going costs, through for example free parking and exemptions from congestion tolls.
- **Government grants** for strategic charging infrastructure, such as charging stations in homes and workplaces or fast charging along expressways, encourage the adoption of electric vehicles reflecting that purchase decisions are influenced by the availability of infrastructure.
- **Such incentives** facilitate the early adoption of electric vehicles and can be phased out as uptake grows.
- **Vehicle taxation and duties**, can be structured to incentivise the purchase of more efficient vehicles.

Fuel economy (FE) standards, important element of a policy package

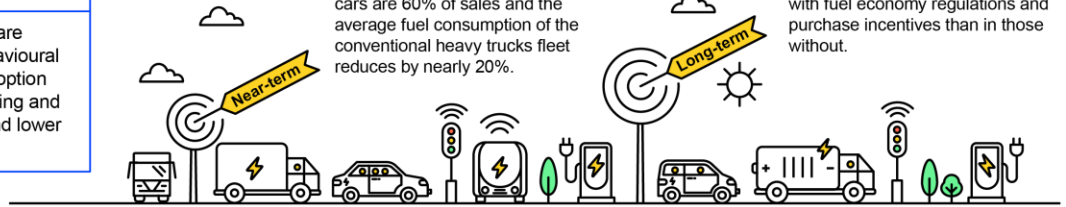
Policy Package – Vehicle Energy efficiency

Immediate opportunities

Significant fuel savings are achievable through behavioural actions including the adoption of best practices for driving and vehicle maintenance, and lower speeds.

In the IEA Net Zero Scenario milestones for 2030, electric cars are 60% of sales and the average fuel consumption of the conventional heavy trucks fleet reduces by nearly 20%.

Efficiency improvement rates for cars are 60% faster in countries with fuel economy regulations and purchase incentives than in those without.



REGULATION

- **Vehicle fuel economy standards** result in greatly reduced fuel use provided they are kept up to date, well monitored and properly enforced.
- **Regulating the import and export of used vehicles** can help improve fleet fuel economy and ensure road safety and air quality benefits.
- **Regulatory and market signals**, such as through stringent standards and target setting, help bring electric vehicles to the market, by providing an impetus to manufacturers to develop these technologies.
- **Regulation** can also help ensure the required infrastructure, for example standardised charging, is in place.

INFORMATION

- **Information campaigns** on carsharing practices and more fuel-efficient driving help people take informed action relating to energy and cost savings. Campaigns are more effective when based on behavioural insights and targeted strategies.
- **Labels inform consumers**, identifying the most efficient vehicles allowing people to choose vehicles that cost less to run. Labels for new and used vehicles help ensure benefits for all vehicle purchasers.

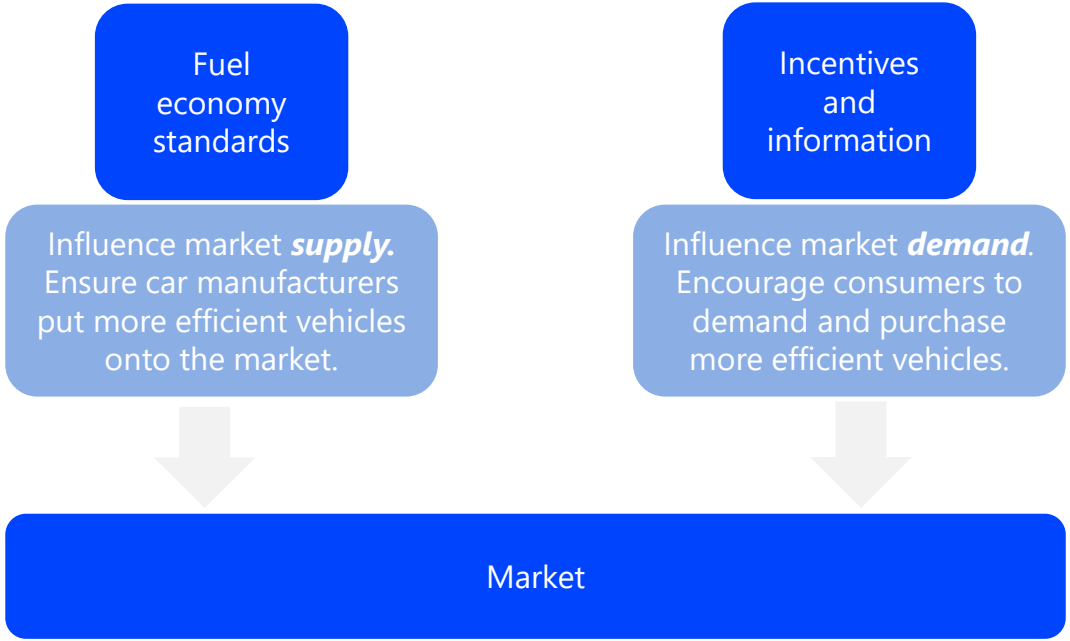
INCENTIVES

- **Incentives** can make vehicle costs cheaper at point of purchase, such as through grants or lower registration fees. They can also reduce on-going costs, through for example free parking and exemptions from congestion tolls.
- **Government grants** for strategic charging infrastructure, such as charging stations in homes and workplaces or fast charging along expressways, encourage the adoption of electric vehicles reflecting that purchase decisions are influenced by the availability of infrastructure.
- **Such incentives** facilitate the early adoption of electric vehicles and can be phased out as uptake grows.
- **Vehicle taxation and duties**, can be structured to incentivise the purchase of more efficient vehicles.

FE standards ensure that efficient vehicles come on to the market

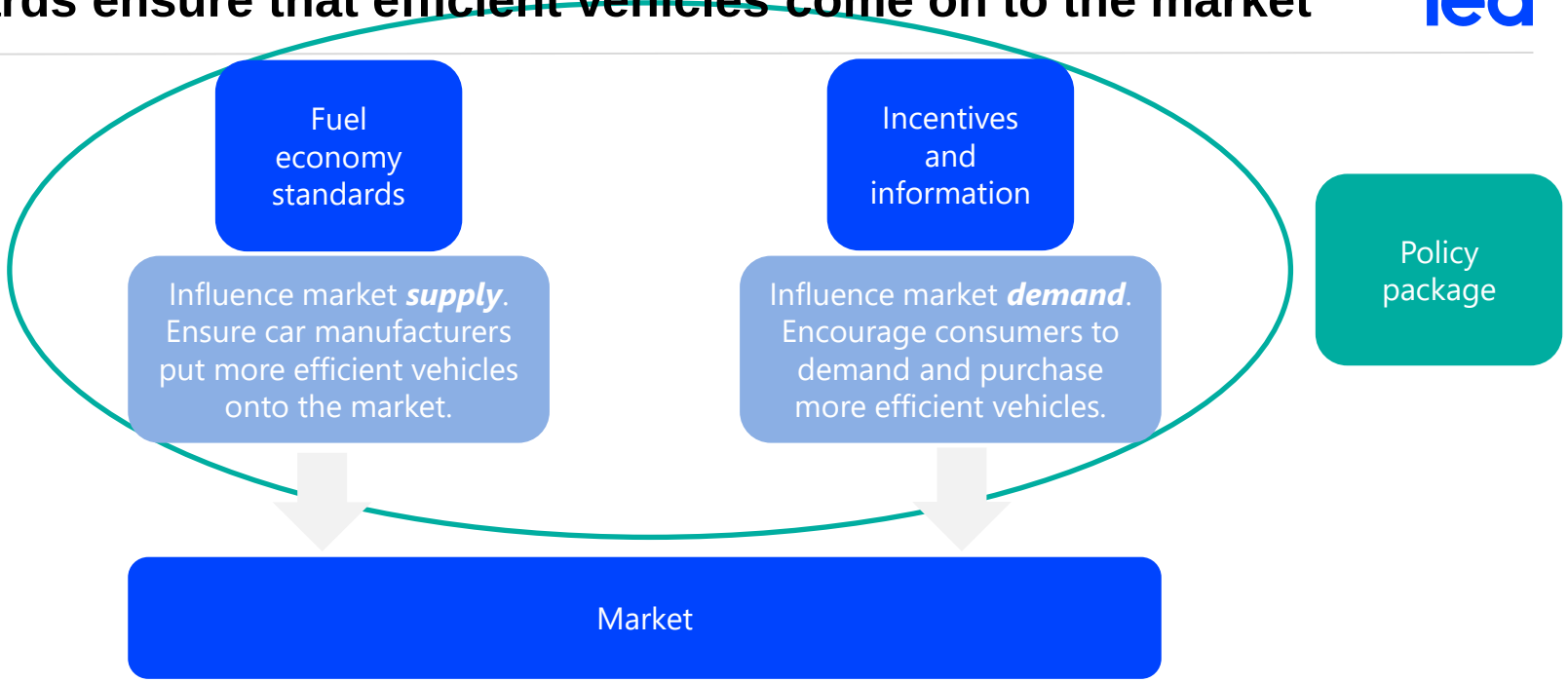
Expanded from ICCT, 2015

FE standards ensure that efficient vehicles come on to the market



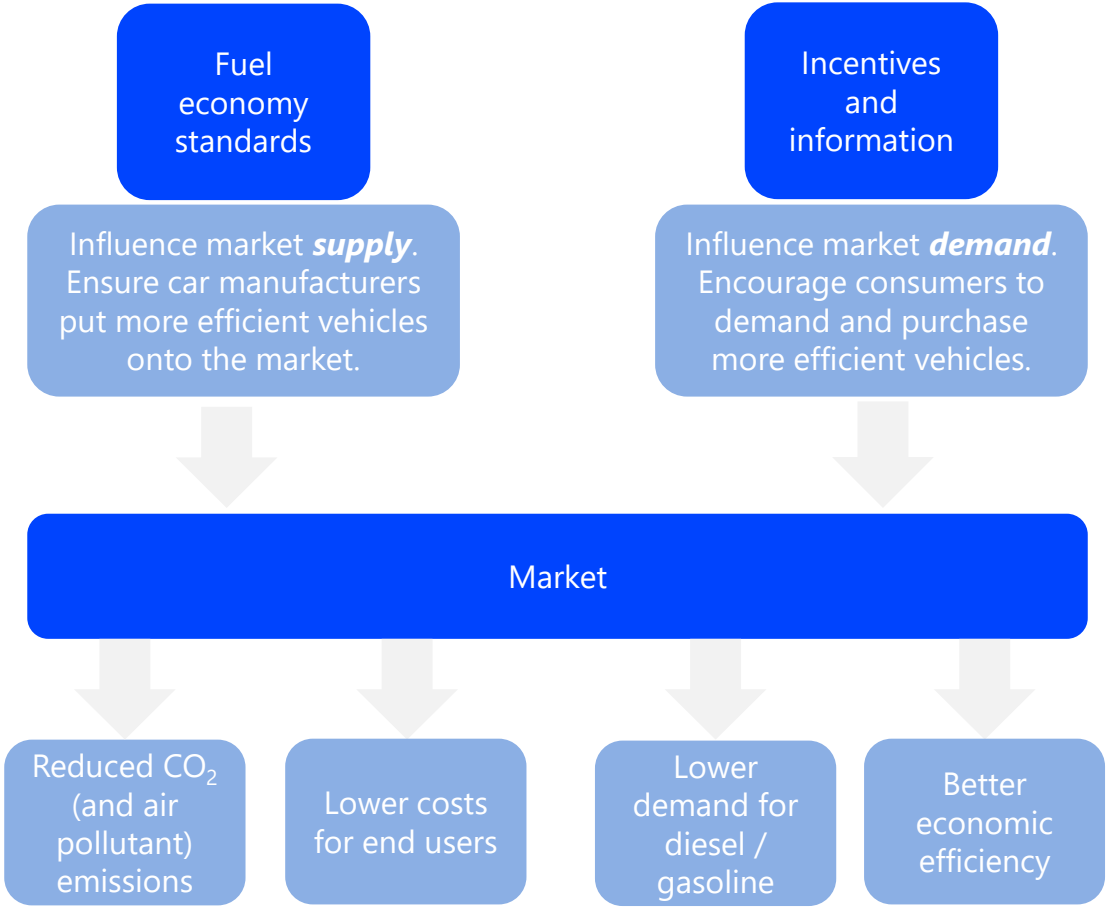
Expanded from ICCT, 2015

FE standards ensure that efficient vehicles come on to the market



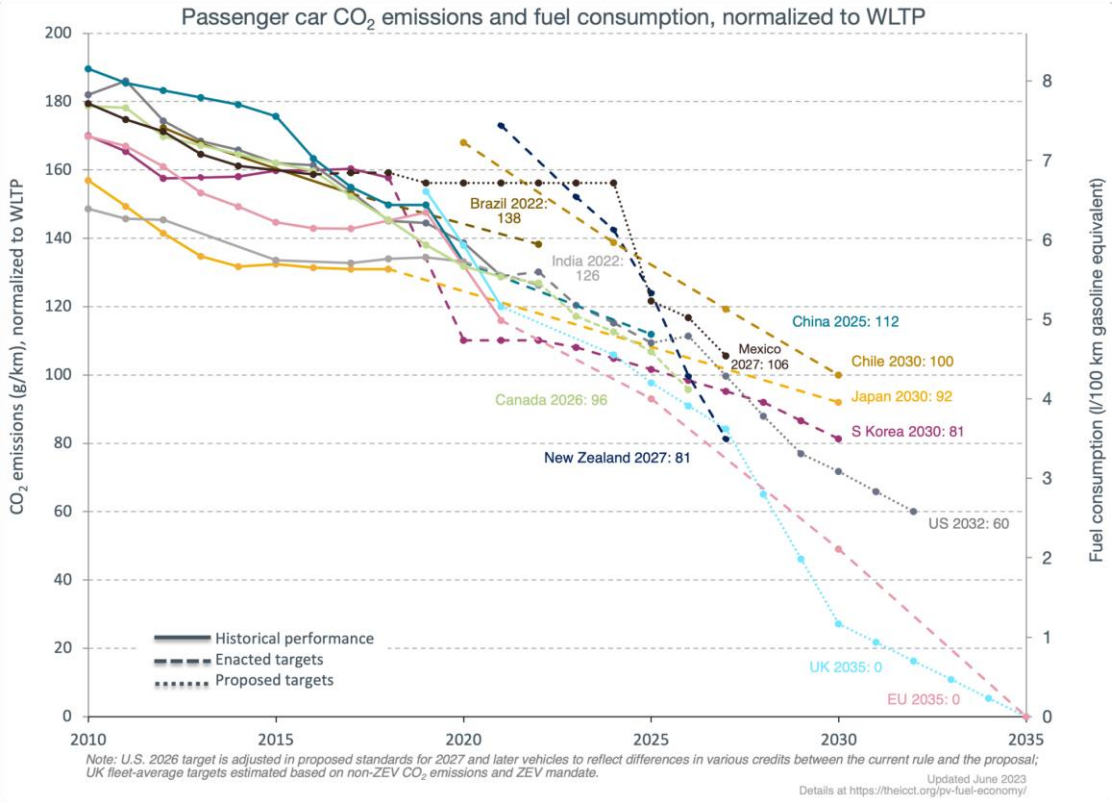
Expanded from ICCT, 2015

FE standards ensure that efficient vehicles come on to the market



Expanded from ICCT, 2015

Standards play an important role in driving forward fuel economy improvements



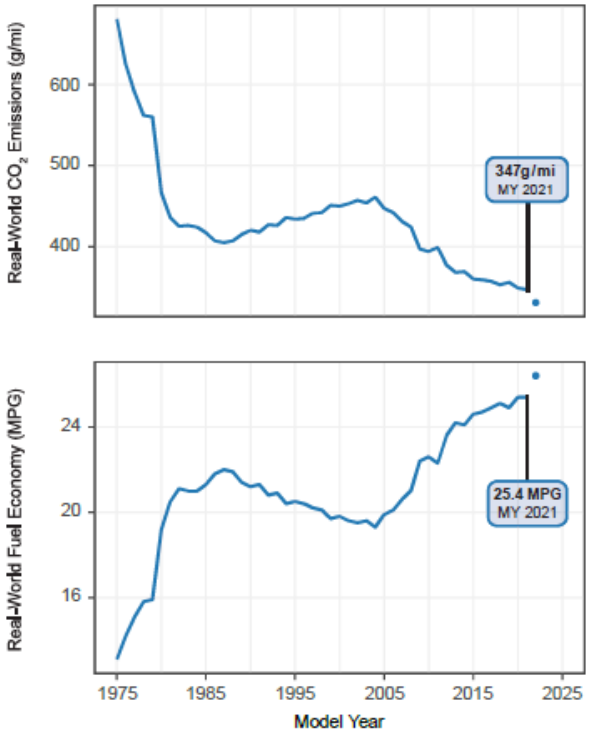
ICCT, 2023

Countries with regulations and/or efficiency-based purchase incentives in place improved efficiency on average 60% faster than countries without such policies

Role of standards in reducing new car CO_2 emissions

- Initial US fuel economy standards were a direct response to the 1973/74 oil crisis
- Led to significant improvements for a market that was made up of a lot of large and inefficient cars
- Standards were not made more stringent in the 1980s and 1990s, so US fuel economy declined once more, partially due to market changes
- New standards set in 2003, to come into force in 2005
- These have been progressively strengthened since

Figure 2.1. Estimated Real-World Fuel Economy and CO_2 Emissions



TransportPolicy.net; US EPA, 2022

Fuel economy standards: What are we regulating?

- Regulate measured – or certified – fuel economy, fuel consumption or CO_2/GHG emissions, e.g. as measured on a test cycle; ***do not regulate actual, real-world*** fuel use or emissions

Regulatory target (cars)	Fuel economy	Fuel consumption	GHG/CO_2 emissions
Metrics	Km/l or mpg	l/100km	g/km or g/mile
Approaches in different countries			

ICCT, various

- Focus has evolved: original US and Japanese standards from the 1970s were a response to global oil crises and so the focus was on fuel economy; by the time of the EU's standards in 2009, focus had shifted to be more on CO_2 emissions
- GHG-based standard could also include air conditioning gases, methane, nitrous oxide (US)
- GHG-based standard equivalent to fuel economy standard, if focuses only on CO_2 emissions

Fuel economy standards: What don't they (generally) cover?

- In addition to ***not regulating actual, real-world, in-use*** fuel use or emissions, fuel economy standards also ***do not (generally) cover***:

Carbon / CO_2 content of fuels

Emissions involved in the production and disposal of vehicles

Emissions from the production of electricity

Photos: iStock

- ***However, real-world fuel use/emissions are important!*** Ideally, measured/certified fuel use/emissions should reflect (average) real-world, in-use fuel consumption/emissions. So, it is important to monitor real-world fuel use/emissions; this information can be used in reviews of the standards.

- ***Life cycle assessment*** does consider all of these elements, and so can be useful to inform policy.

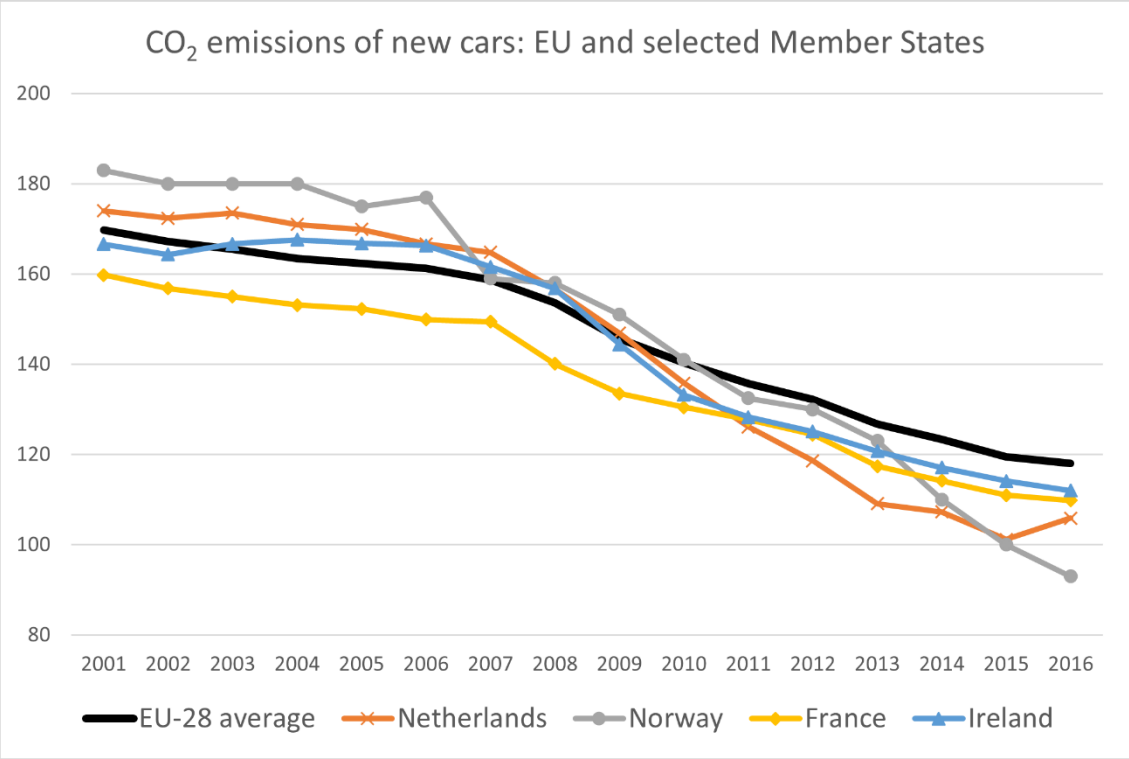
Fuel economy standards and electrification

Electric vehicle inclusion in regulation	Standard type	Measures to facilitate EVs				Measures to achieve EV targets	
		EVs are treated as zero emissions /zero energy use		Inclusion of EVS has additional weighting		ZEV mandates or mandate style approaches	
		Current /Historic	Future	Current /Historic	Future	Current /Historic	Future
Canada	GHG emission limits	✓	✓ limit	✓			✓ State level
China	Fuel economy standards	✓	✓	✓	Depends on Phase 3 of NEV policy	✓	✓
India				✓			✓ State level
US	Fuel economy standards and GHG emission limits	✓	✓ limit	✓			✓ State level
EU and UK	CO_2 emissions	✓	✓	✓			✓
Japan	Fuel economy /efficiency standards top runner approach						

ICCT, 2018 Modernizing Electric Vehicles for Regulation, ICCT 2019, Incentivizing Electric Vehicles to meet Fuel Consumption Standards for Cars and IEA Analysis

Enhancing effectiveness: Fuel economy standards and fiscal incentives

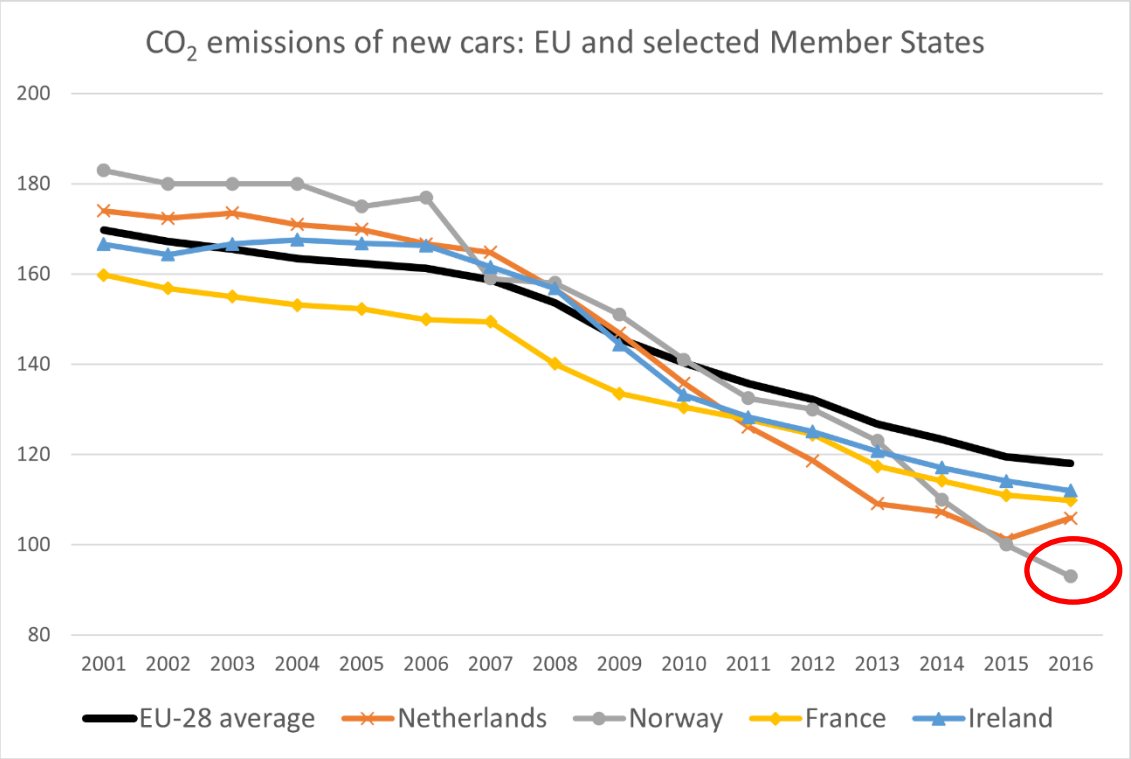
Well-designed incentives can further complement standards



Developed from EEA, 2018

Incentives can improve the rate of improvement of a country's per vehicle CO_2 emissions/fuel economy in markets with fuel economy standards.

Well-designed incentives can further complement standards

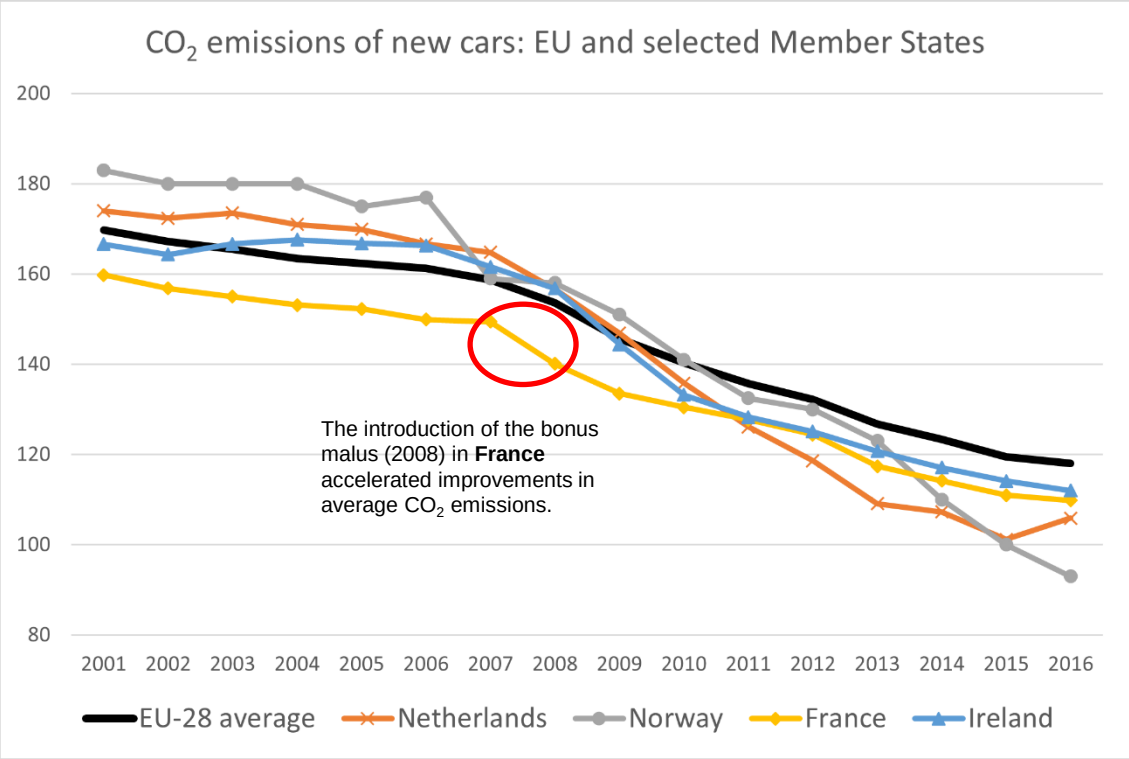


Long term set of incentives has enabled **Norway** to significantly improve its average CO_2 emissions.

Developed from EEA, 2018

Incentives can improve the rate of improvement of a country's per vehicle CO_2 emissions/fuel economy in markets with fuel economy standards.

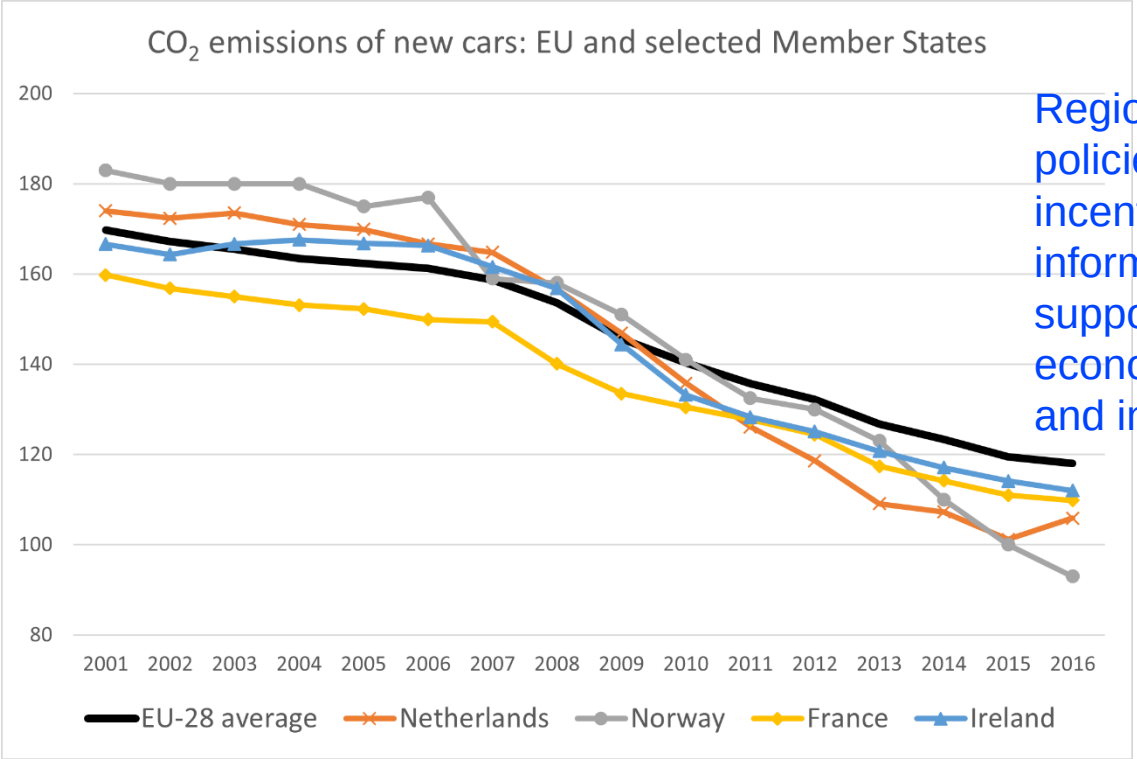
Well-designed incentives can further complement standards



Developed from EEA, 2018

Incentives can improve the rate of improvement of a country's per vehicle CO_2 emissions/fuel economy in markets with fuel economy standards.

Well-designed incentives can further complement standards



Regional and local policies, such as incentives and information, can support national fuel economy standards and incentives

Developed from EEA, 2018

Incentives can improve the rate of improvement of a country's per vehicle CO_2 emissions/fuel economy in markets with fuel economy standards.

Main messages and resources

Main messages

- Regulations can support different ways of improving transport's energy efficiency / reducing transport emissions, including:
  - Supporting the deployment of electric vehicles
  - Improving the fuel economy of petrol and diesel vehicles
  - Improving the efficiency of use of vehicles and space, particularly regulating in favour of public transport

- Regulation can support electro-mobility through:
  - The development of national policy frameworks
  - Setting deployment targets for infrastructure and vehicles, including in Government/public fleets
  - Complementary regulation, such as changes to building codes

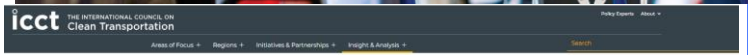
- Fuel economy standards (best implemented as part of a policy package) help countries reduce CO_2 emissions / improve fuel economy at a faster rate than countries without standards

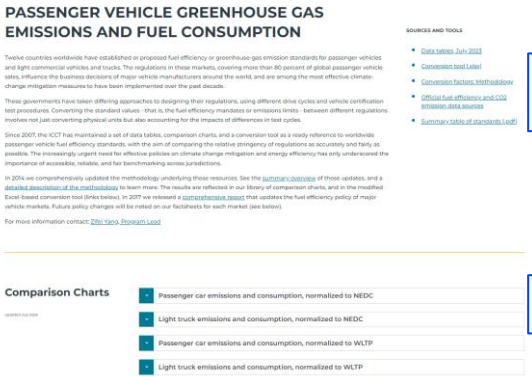
- Fuel economy / CO_2 standards can also be used to support the electrification of the fleet and can also include specific incentives to encourage the uptake of electric vehicles.

Resources

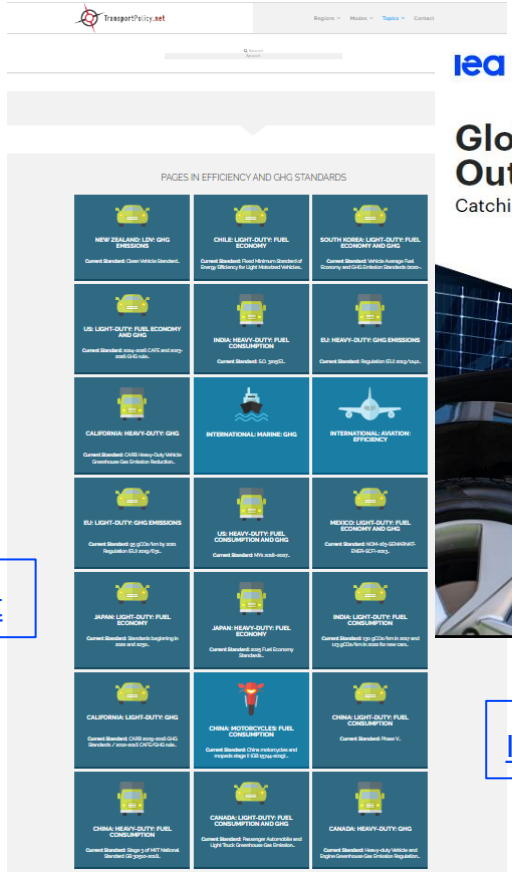
Link

GFEI

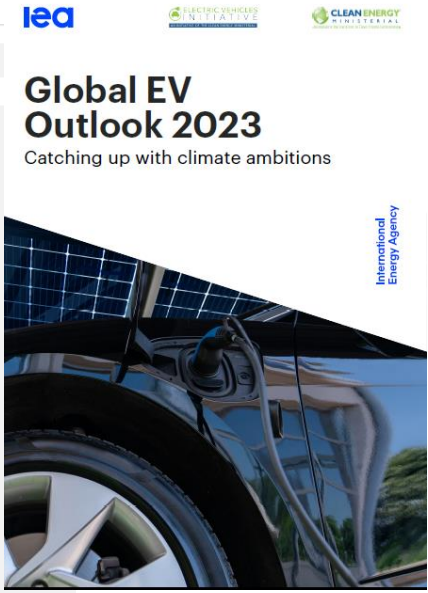




ICCT



Transport Policy Net



IEA, 2023

Group exercise

You and your team have been put in charge of developing a strategy which incorporates a series of recommendations on regulations and frameworks to take forward improvements in the fuel efficiency of vehicles in your State.

The regulations can focus on buses, cars or two and three-wheelers.

Please take twenty minutes to consider:

- which mode(s) you would focus on and why?
- the role you would give to infrastructure and what form this would take
- what targets you would set (if any)
- whether you would engage on actions at the National Level

We recognise that a mixture of States will be working together and we are keen to hear from a range of options.

Africa Energy Efficiency Policy in Emerging Economies Training Week

Transport

Nairobi
18-21 March 2024

International Energy Agency

Transport: Making it happen – Regulating vehicle imports to improve energy efficiency Day 2, 19 March 2024

Dr Ian Skinner, Director/Transport and Environmental Policy Research

Training roadmap

Overview

Regulating used car imports to improve fuel efficiency: Taking a policy package approach

The importance of regulating used vehicle imports

Used vehicle flows: Current situation and potential evolution

Regulating used vehicle imports to improve energy efficiency

Learning outcomes

- This session will focus on developing your capabilities to:

  - Understand the importance of regulating the energy/fuel efficiency of vehicles that are imported from elsewhere

  - Understand the current – and potential future – flows of used vehicles, globally

  - Recognise the role of regulation in improving the efficiency of imported vehicles

Regulating used car imports to improve fuel efficiency: Taking a policy package approach

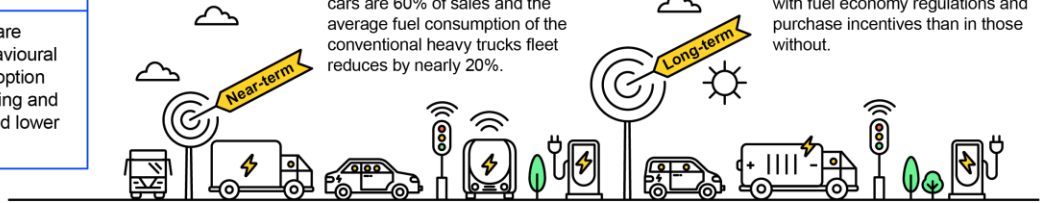
Policy Package – Vehicle Energy efficiency

Immediate opportunities

Significant fuel savings are achievable through behavioural actions including the adoption of best practices for driving and vehicle maintenance, and lower speeds.

In the IEA Net Zero Scenario milestones for 2030, electric cars are 60% of sales and the average fuel consumption of the conventional heavy trucks fleet reduces by nearly 20%.

Efficiency improvement rates for cars are 60% faster in countries with fuel economy regulations and purchase incentives than in those without.



REGULATION

- **Vehicle fuel economy standards** result in greatly reduced fuel use provided they are kept up to date, well monitored and properly enforced.
- **Regulating the import and export of used vehicles** can help improve fleet fuel economy and ensure road safety and air quality benefits.
- **Regulatory and market signals**, such as through stringent standards and target setting, help bring electric vehicles to the market, by providing an impetus to manufacturers to develop these technologies.
- **Regulation** can also help ensure the required infrastructure, for example standardised charging, is in place.

INFORMATION

- **Information campaigns** on carsharing practices and more fuel-efficient driving help people take informed action relating to energy and cost savings. Campaigns are more effective when based on behavioural insights and targeted strategies.
- **Labels inform consumers**, identifying the most efficient vehicles allowing people to choose vehicles that cost less to run. Labels for new and used vehicles help ensure benefits for all vehicle purchasers.

INCENTIVES

- **Incentives** can make vehicle costs cheaper at point of purchase, such as through grants or lower registration fees. They can also reduce on-going costs, through for example free parking and exemptions from congestion tolls.
- **Government grants** for strategic charging infrastructure, such as charging stations in homes and workplaces or fast charging along expressways, encourage the adoption of electric vehicles reflecting that purchase decisions are influenced by the availability of infrastructure.
- **Such incentives** facilitate the early adoption of electric vehicles and can be phased out as uptake grows.
- **Vehicle taxation and duties**, can be structured to incentivise the purchase of more efficient vehicles.

IEA, 2023 Energy Efficiency Policy toolkit

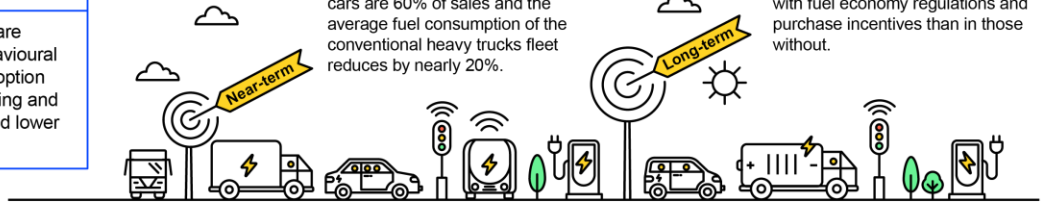
Policy Package – Vehicle Energy efficiency

Immediate opportunities

Significant fuel savings are achievable through behavioural actions including the adoption of best practices for driving and vehicle maintenance, and lower speeds.

In the IEA Net Zero Scenario milestones for 2030, electric cars are 60% of sales and the average fuel consumption of the conventional heavy trucks fleet reduces by nearly 20%.

Efficiency improvement rates for cars are 60% faster in countries with fuel economy regulations and purchase incentives than in those without.



REGULATION

- **Vehicle fuel economy standards** result in greatly reduced fuel use provided they are kept up to date, well monitored and properly enforced.
- **Regulating the import and export of used vehicles** can help improve fleet fuel economy and ensure road safety and air quality benefits.
- **Regulatory and market signals**, such as through stringent standards and target setting, help bring electric vehicles to the market, by providing an impetus to manufacturers to develop these technologies.
- **Regulation** can also help ensure the required infrastructure, for example standardised charging, is in place.

INFORMATION

- **Information campaigns** on carsharing practices and more fuel-efficient driving help people take informed action relating to energy and cost savings. Campaigns are more effective when based on behavioural insights and targeted strategies.
- **Labels inform consumers**, identifying the most efficient vehicles allowing people to choose vehicles that cost less to run. Labels for new and used vehicles help ensure benefits for all vehicle purchasers.

INCENTIVES

- **Incentives** can make vehicle costs cheaper at point of purchase, such as through grants or lower registration fees. They can also reduce on-going costs, through for example free parking and exemptions from congestion tolls.
- **Government grants** for strategic charging infrastructure, such as charging stations in homes and workplaces or fast charging along expressways, encourage the adoption of electric vehicles reflecting that purchase decisions are influenced by the availability of infrastructure.
- **Such incentives** facilitate the early adoption of electric vehicles and can be phased out as uptake grows.
- **Vehicle taxation and duties**, can be structured to incentivise the purchase of more efficient vehicles.

IEA, 2023 Energy Efficiency Policy toolkit

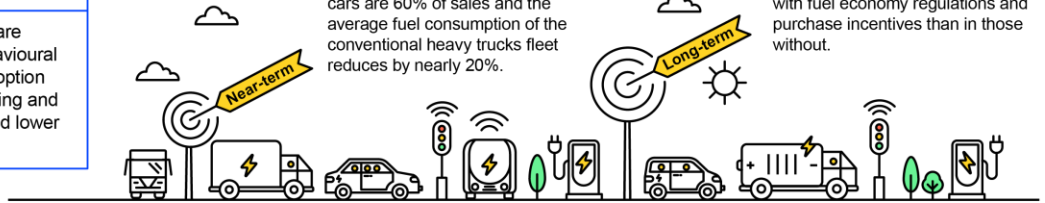
Policy Package – Vehicle Energy efficiency

Immediate opportunities

Significant fuel savings are achievable through behavioural actions including the adoption of best practices for driving and vehicle maintenance, and lower speeds.

In the IEA Net Zero Scenario milestones for 2030, electric cars are 60% of sales and the average fuel consumption of the conventional heavy trucks fleet reduces by nearly 20%.

Efficiency improvement rates for cars are 60% faster in countries with fuel economy regulations and purchase incentives than in those without.



REGULATION

- **Vehicle fuel economy standards** result in greatly reduced fuel use provided they are kept up to date, well monitored and properly enforced.
- **Regulating the import and export of used vehicles** can help improve fleet fuel economy and ensure road safety and air quality benefits.
- **Regulatory and market signals**, such as through stringent standards and target setting, help bring electric vehicles to the market, by providing an impetus to manufacturers to develop these technologies.
- **Regulation** can also help ensure the required infrastructure, for example standardised charging, is in place.

INFORMATION

- **Information campaigns** on carsharing practices and more fuel-efficient driving help people take informed action relating to energy and cost savings. Campaigns are more effective when based on behavioural insights and targeted strategies.
- **Labels inform consumers**, identifying the most efficient vehicles allowing people to choose vehicles that cost less to run. Labels for new and used vehicles help ensure benefits for all vehicle purchasers.

INCENTIVES

- **Incentives** can make vehicle costs cheaper at point of purchase, such as through grants or lower registration fees. They can also reduce on-going costs, through for example free parking and exemptions from congestion tolls.
- **Government grants** for strategic charging infrastructure, such as charging stations in homes and workplaces or fast charging along expressways, encourage the adoption of electric vehicles reflecting that purchase decisions are influenced by the availability of infrastructure.
- **Such incentives** facilitate the early adoption of electric vehicles and can be phased out as uptake grows.
- **Vehicle taxation and duties**, can be structured to incentivise the purchase of more efficient vehicles.

IEA, 2023 Energy Efficiency Policy toolkit

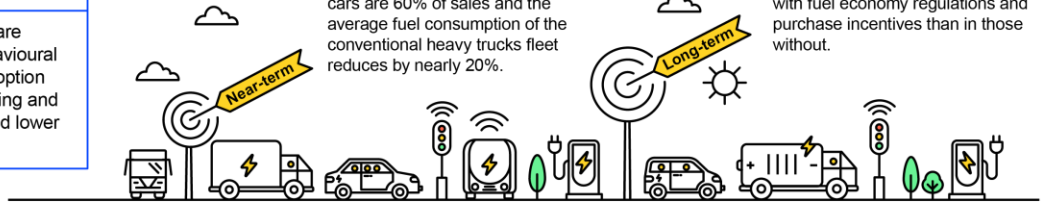
Policy Package – Vehicle Energy efficiency

Immediate opportunities

Significant fuel savings are achievable through behavioural actions including the adoption of best practices for driving and vehicle maintenance, and lower speeds.

In the IEA Net Zero Scenario milestones for 2030, electric cars are 60% of sales and the average fuel consumption of the conventional heavy trucks fleet reduces by nearly 20%.

Efficiency improvement rates for cars are 60% faster in countries with fuel economy regulations and purchase incentives than in those without.



REGULATION

- **Vehicle fuel economy standards** result in greatly reduced fuel use provided they are kept up to date, well monitored and properly enforced.
- **Regulating the import and export of used vehicles** can help improve fleet fuel economy and ensure road safety and air quality benefits.
- **Regulatory and market signals**, such as through stringent standards and target setting, help bring electric vehicles to the market, by providing an impetus to manufacturers to develop these technologies.
- **Regulation** can also help ensure the required infrastructure, for example standardised charging, is in place.

INFORMATION

- **Information campaigns** on carsharing practices and more fuel-efficient driving help people take informed action relating to energy and cost savings. Campaigns are more effective when based on behavioural insights and targeted strategies.
- **Labels inform consumers**, identifying the most efficient vehicles allowing people to choose vehicles that cost less to run. Labels for new and used vehicles help ensure benefits for all vehicle purchasers.

INCENTIVES

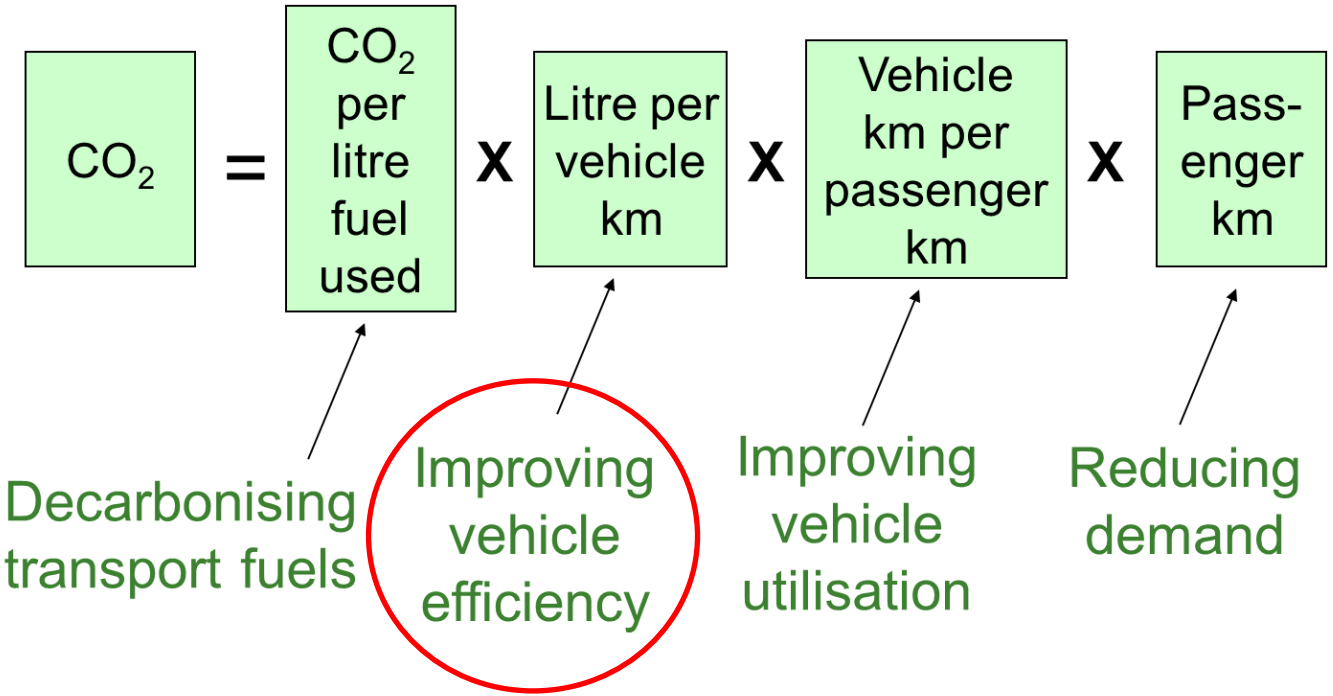
- **Incentives** can make vehicle costs cheaper at point of purchase, such as through grants or lower registration fees. They can also reduce on-going costs, through for example free parking and exemptions from congestion tolls.
- **Government grants** for strategic charging infrastructure, such as charging stations in homes and workplaces or fast charging along expressways, encourage the adoption of electric vehicles reflecting that purchase decisions are influenced by the availability of infrastructure.
- **Such incentives** facilitate the early adoption of electric vehicles and can be phased out as uptake grows.
- **Vehicle taxation and duties**, can be structured to incentivise the purchase of more efficient vehicles.

IEA, 2023 Energy Efficiency Policy toolkit

Regulation at the National level

Regulation to improve the fuel efficiency of vehicles is a national role that can take the form of fuel efficiency standards that regulate the performance of new vehicles (as discussed earlier) or regulations on the import of used vehicles.

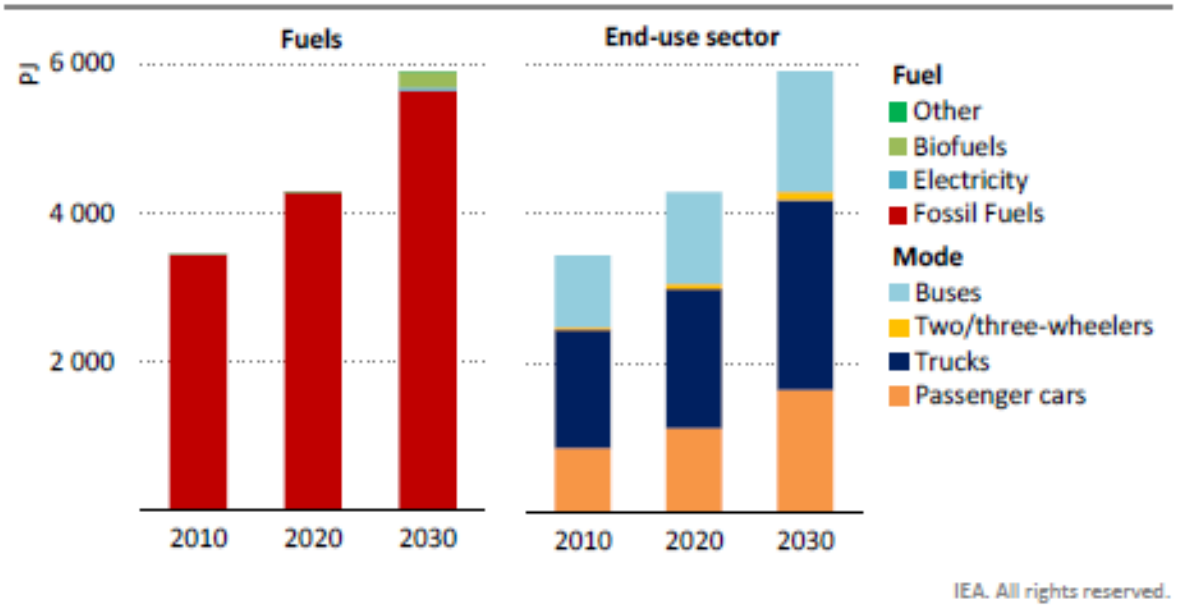
Regulating the import of used vehicles to improve vehicle efficiency



The importance of regulating used vehicle imports

Fossil fuels will continue to dominate transport fuel use

Road transport energy demand by fuel and mode in the SAS

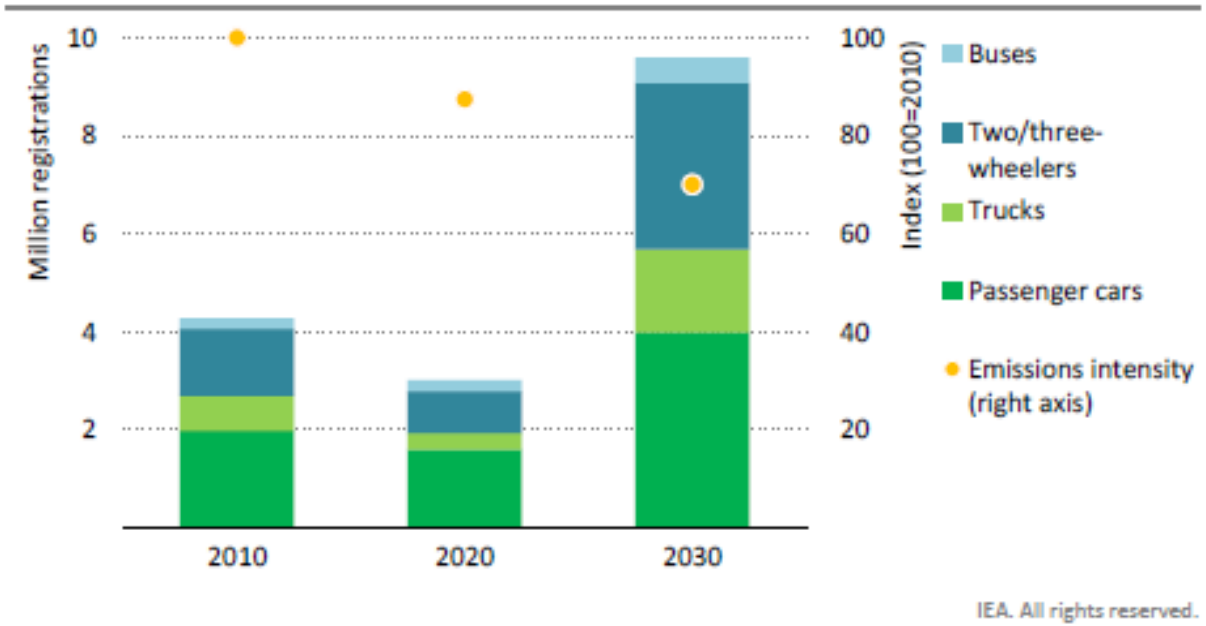


Source: IEA (2022)

In IEA's SAS (Sustainable Africa Scenario), the vast majority of transport's increased energy needs will come from fossil fuels in 2030; this is likely to be the case for much of the 2030s.

Potential first-time vehicle registrations and associated CO_2 intensity

First-time road vehicle registrations and CO_2 emissions intensity by type in the SAS

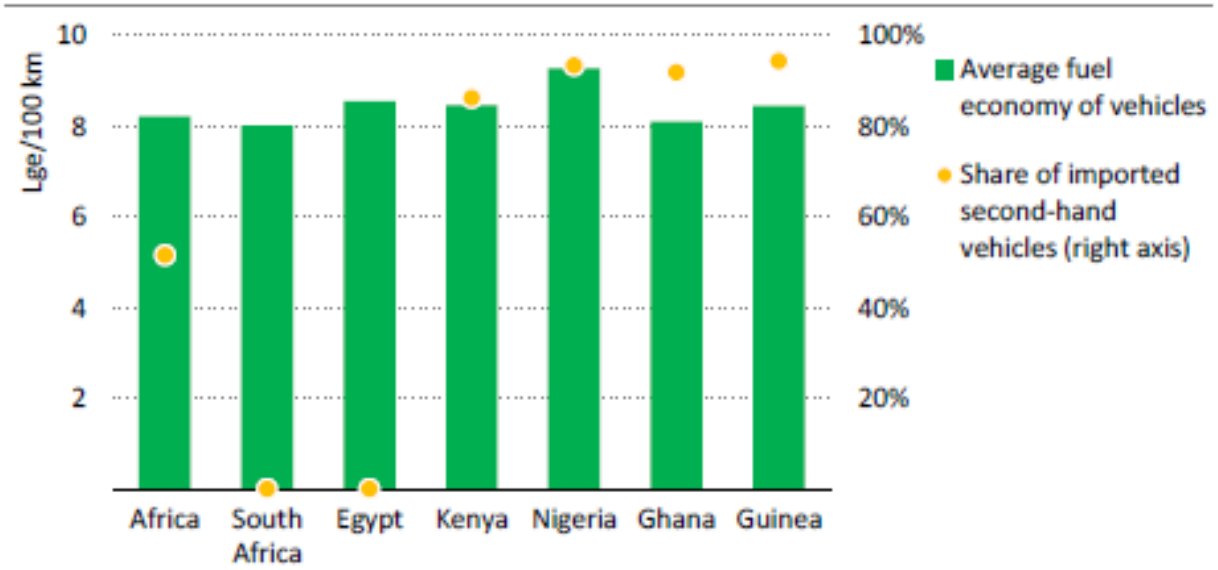


Source: IEA (2022)

In IEA's SAS, first-time road transport vehicle registrations increase significantly, although their average CO_2 emissions intensity improves

Imported vehicles as share of annual sales and associated fuel economy

Fuel economy of passenger car registrations and share of imported used vehicles in annual sales, selected African countries, 2020)



Source: IEA (2022)

High shares of imported second-hand cars with limited standards result in poor fuel economy and limit the scope for reducing emissions in the medium-term.

Policy measures can help improve fuel economy of imported cars

Potential fuel economy improvement of imported used cars and related oil savings by type of measure in sub-Saharan Africa by 2030

Source: IEA (2022)

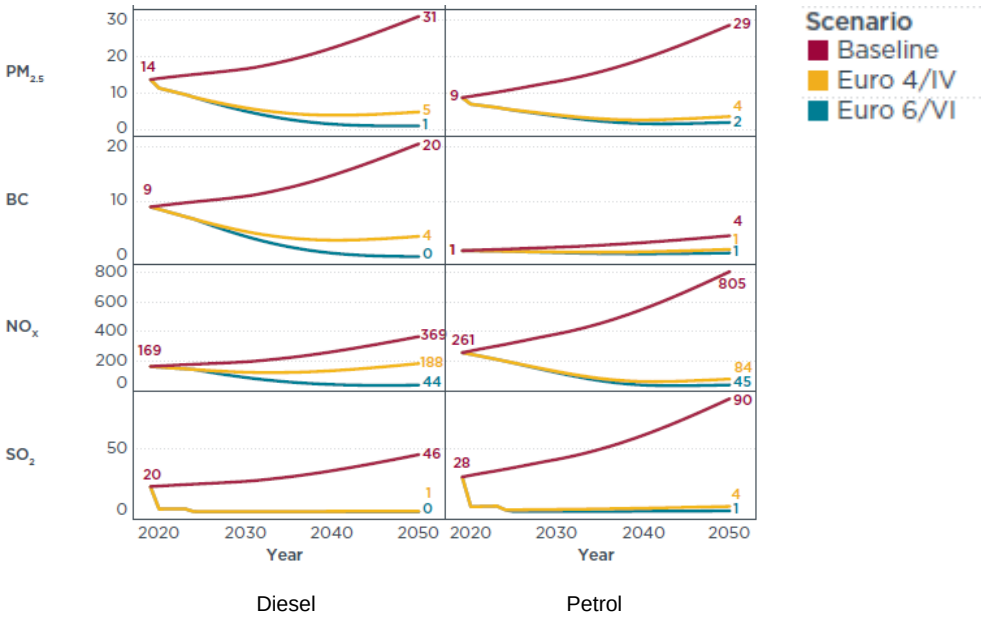
IEA has estimated that a total ban on imported cars could deliver improvements in average fuel economy of nearly 15%; impacts of regulations based on emission standards and age increase as they become more stringent.

Policy measures can also reduce air pollutant emissions

Road transport exhaust emissions by fuel type and scenario (Nigeria; 2020-2050; thousand metric tons per year)

Scenarios definitions:

- ***Baseline***: Sulphur at 3,000/1,000 ppm; 15-year age limit for used car imports; no mandatory emission standards
- ***Euro 4/IV:*** From 2020, sulphur at 50 ppm (imported fuel; 2024 domestically refined), Euro 4/IV for all new and used cars
- ***Euro 6/VI***: Euro 4/IV scenario, then from 2025, sulphur at 10 ppm, Euro 6/VI for all new and used cars, Euro V for 2/3-wheelers



Source: ICCT (2021)

ICCT's scenarios suggest significant reductions in air pollutants could be achieved from regulating the emissions standard of new ***and*** used vehicles.

The importance of regulating used vehicle imports: Summary

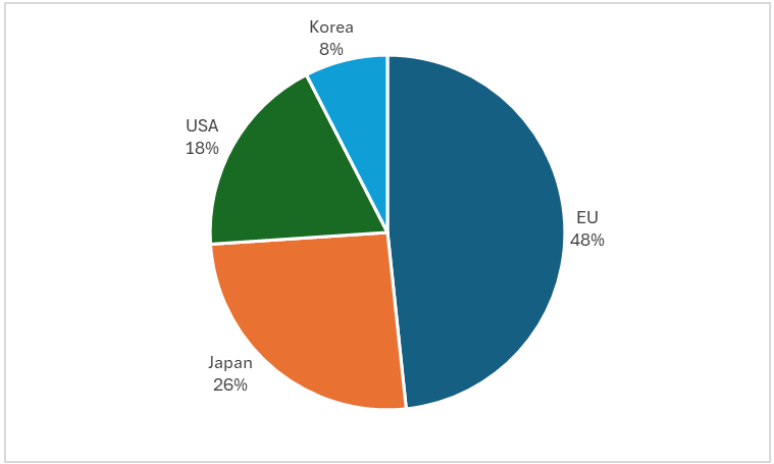
- Fossil fuels are likely to dominate transport's energy needs in Africa (and elsewhere) until 2030 and for many years afterwards
- Given the significant potential increase in new vehicle registrations in the 2020s (and 2030s), it will be important to take action to improve the fuel efficiency of used vehicles in order to:
  - Reduce the demand for fuel;
  - Limit the adverse environmental (climate change/CO_2 emissions) and health impacts (air pollution) of fuel use
- Given the high share of imported vehicles in first-time car registrations in many African countries, improving the efficiency of imported vehicles will be important to improve the efficiency of the fleet overall
- Different regulations have the potential to improve the fuel economy of the fleet overall to different extents

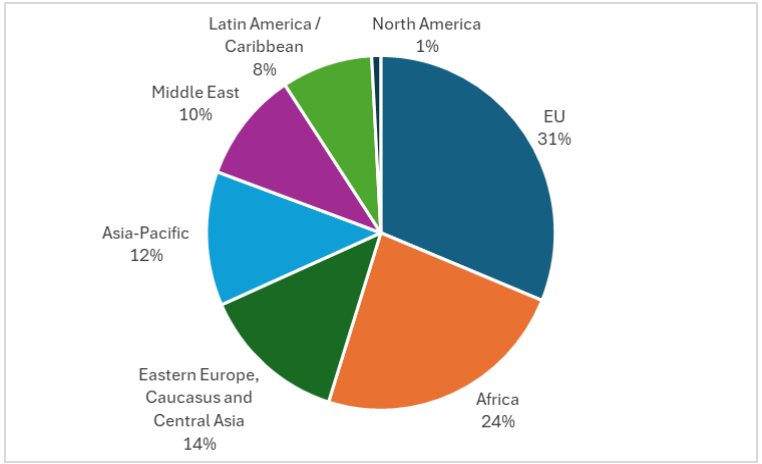
Photo: iStock

Used vehicle flows:
Current situation and potential evolution

Used light duty vehicle (LDV) flows

Exporters and importers of used cars (2015-20)





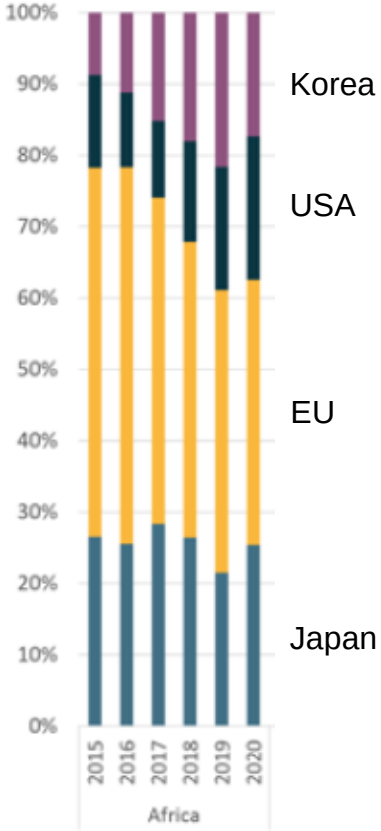
60% of annual registrations in Africa are used vehicles (UN Environment, 2020)

Source: IEA graphs, based on data in UN Environment (2021)

UN Environment identified four exporting areas, of which Europe and Japan are the largest suppliers to Africa. Of the 23 million used LDV exports between 2015 and 2020, Africa received 5.6 million units.

Where Africa imports its used LDVs from is changing

Share of Used Light-Duty Vehicle Exports from the EU, USA, Japan, and Korea to Africa (2015-2020)

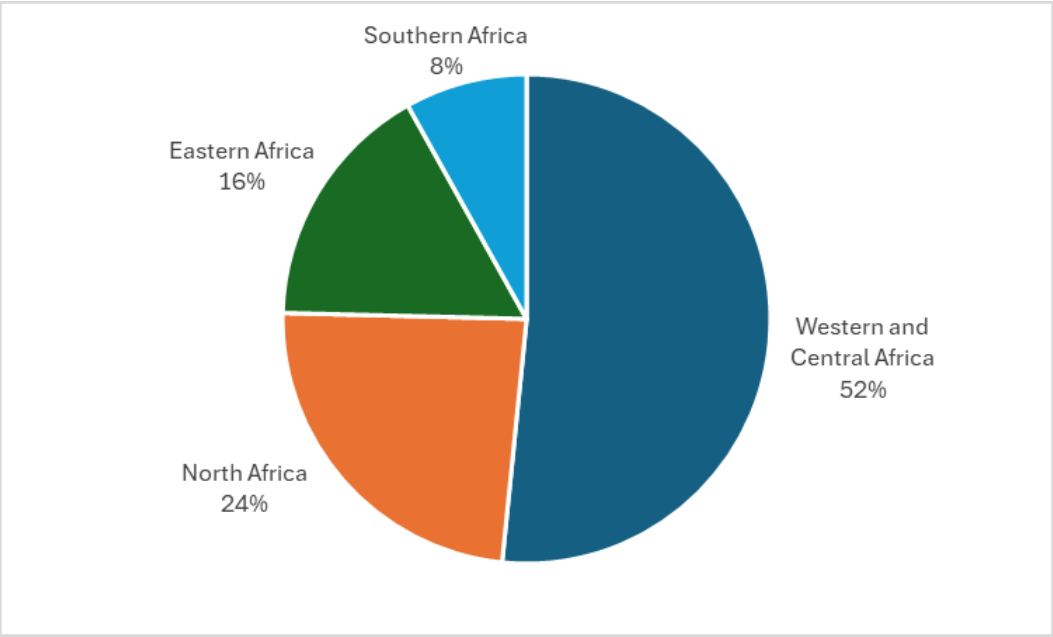


Source: UN Environment (2021)

Even though, historically, Africa's used LDVs have come from Europe and Japan, this is changing, as the share of imports from both the USA and Korea have been increasing.

Where used LDVs go in Africa (2020)

Distribution of used LDV imports in Africa by sub-region (2020)

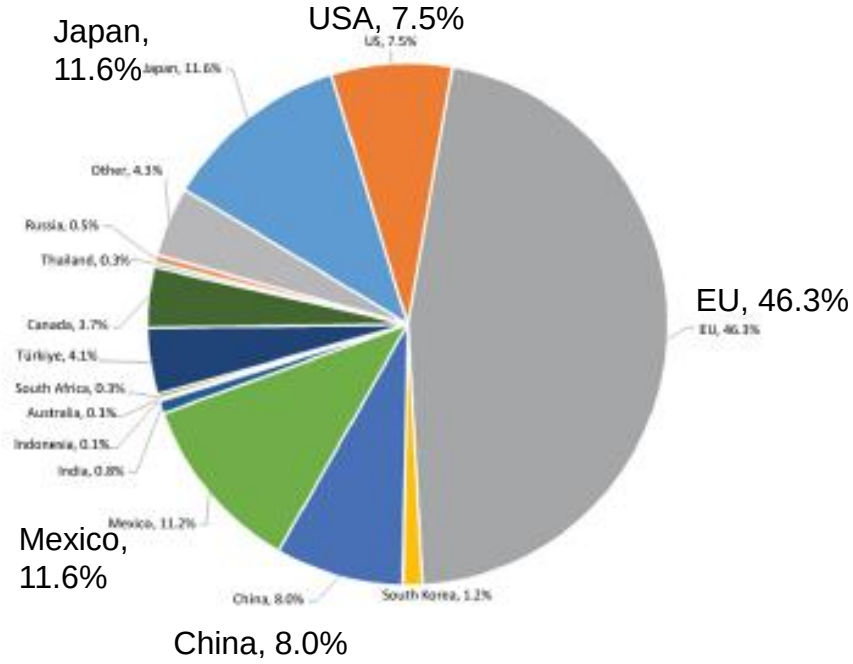


Source: IEA graph, based on data in UN Environment (2021)

Over half of Africa's used LDV imports end up in Western and Central Africa; the African countries that imported most used LDVs in 2020 were Libya, Nigeria, Ghana, Kenya and Benin.

New and used heavy duty vehicle (HDV) exporters

Exporters of new and used HDVs (by value; 2015-20)



Source: UN Environment (2024)

UN Environment estimated that in 2020, around 45% of the EU's ***used*** HDV went to Africa.

Used HDV importers

Top 10 importing countries of used HDVs from EU, Japan and Korea (2015-20)

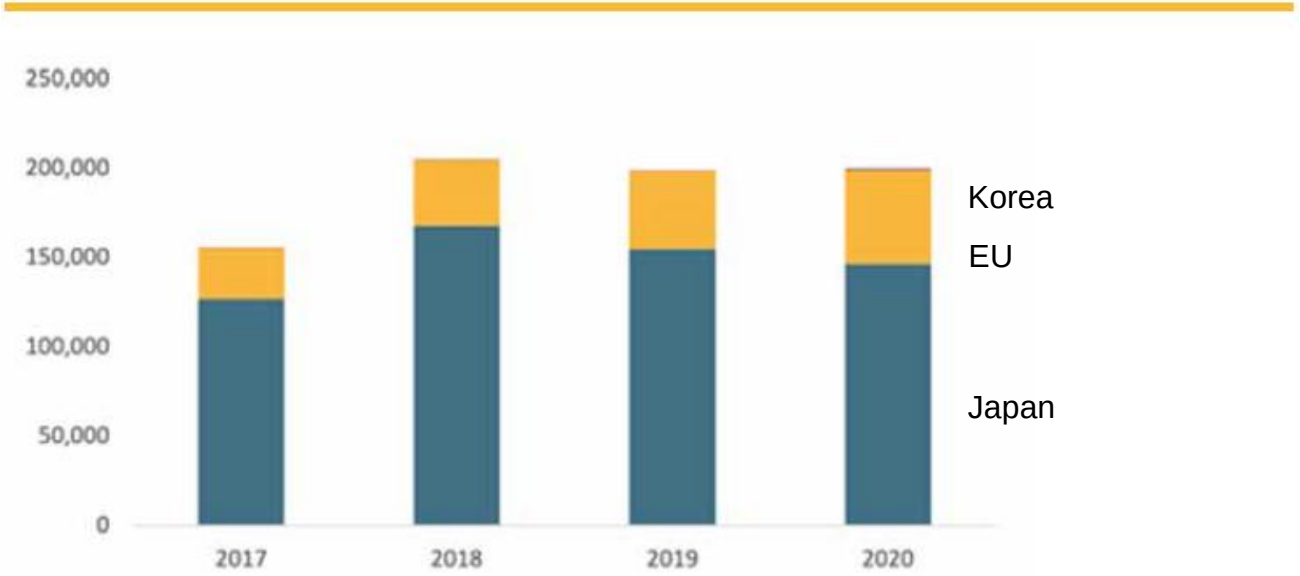
2015	2016	2017	2018	2019	2020
MYANMAR	MYANMAR	MYANMAR	JORDAN	PHILIPPINES	NIGERIA
UNITED ARAB EMIRATES	UKRAINE	PHILIPPINES	PHILIPPINES	SAUDI ARABIA	UKRAINE
PHILIPPINES	PHILIPPINES	UNITED ARAB EMIRATES	TANZANIA	UNITED ARAB EMIRATES	MYANMAR
UNITED STATES	UNITED ARAB EMIRATES	RUSSIAN FEDERATION	UNITED ARAB EMIRATES	TANZANIA	KENYA
JORDAN	NIGERIA	UKRAINE	MYANMAR	NIGERIA	JORDAN
UKRAINE	RUSSIAN FEDERATION	SOUTH AFRICA	SERBIA	UKRAINE	CHILE
KENYA	JORDAN	PAKISTAN	UKRAINE	MYANMAR	KAZAKHSTAN
NIGERIA	SINGAPORE	TANZANIA	ZIMBABWE	RUSSIAN FEDERATION	MONGOLIA
RUSSIAN FEDERATION	KENYA	KENYA	RUSSIAN FEDERATION	ZIMBABWE	LIBYA
SOUTH AFRICA	PAKISTAN	NIGERIA	NIGERIA	KENYA	GUINEA

Source: UN Environment (2024)

UN Environment estimated that in 2020, around 45% of the EU's ***used*** HDV went to Africa.

Used hybrid and battery electric LDV exports currently relatively low

Used light duty hybrids, plug-in hybrid and battery electric vehicles traded by EU, Japan and Korea (2017-2020)

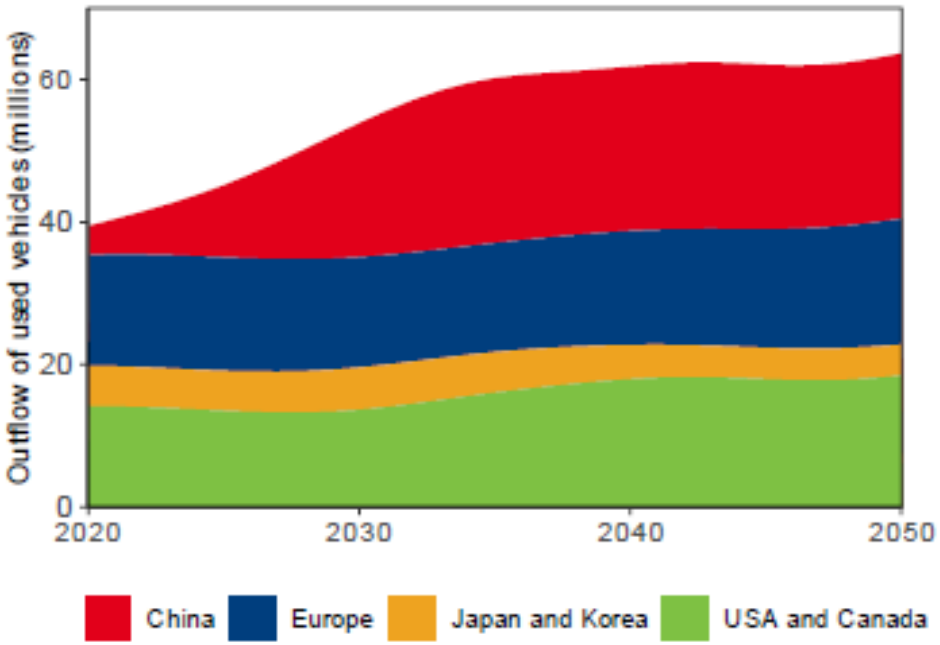


Source: UN Environment (2021)

Of the three major exporters for which data was available (no data was available for the USA), UN Environment identified that Africa received 36,000 used electric LDVs (or 5% of the total traded) between 2017 and 2020.

The origin of used LDV exports is likely to change

Global forecast of vehicle stock outflows by region of origin



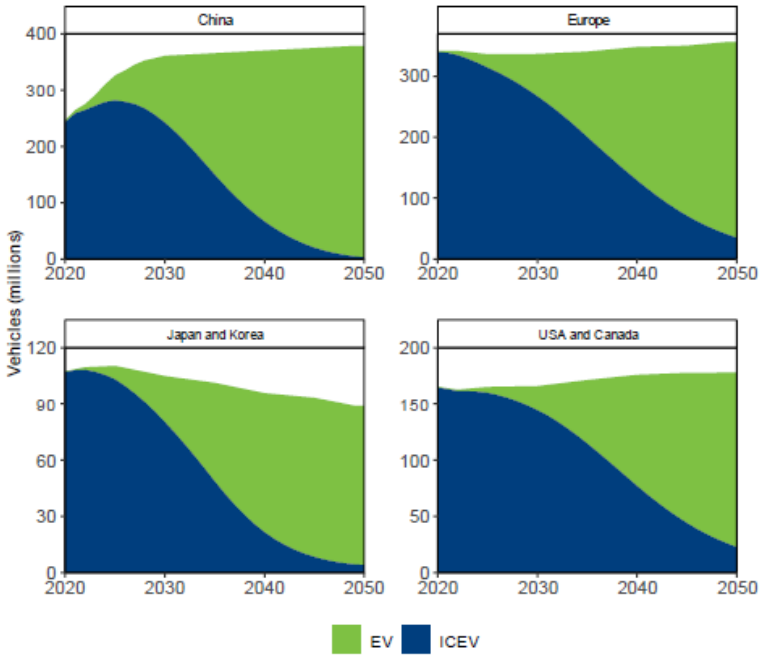
In 2019, China announced that it was allowing used car exports for the first time

Source: ITF (2023)

ITF research suggests that China is expected to become an important source of used vehicles over the next decade.

Make up of vehicle stock of main exporters is changing

Estimated passenger car stock for selected vehicle exporting regions by powertrain

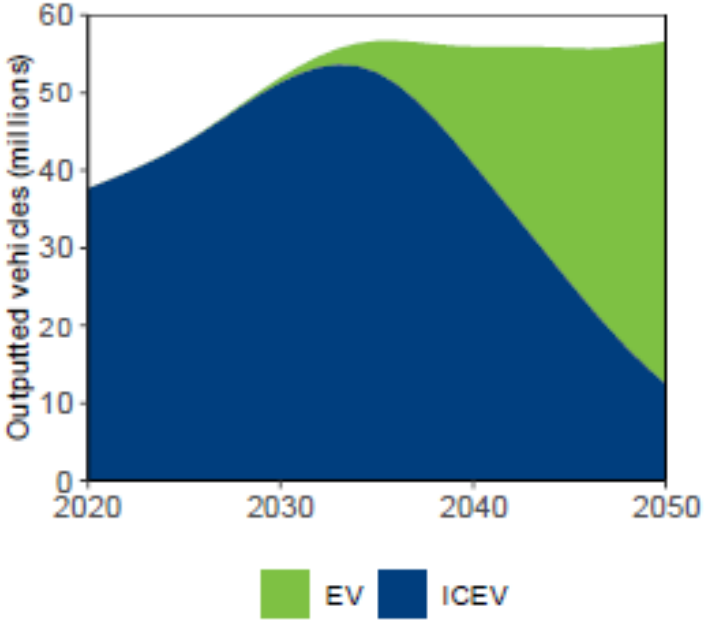


Source: ITF (2023)

Electric vehicles will increasingly become the norm in the main used vehicle exporting countries, particularly between 2030 and 2040.

Make up of used vehicle trade will also change

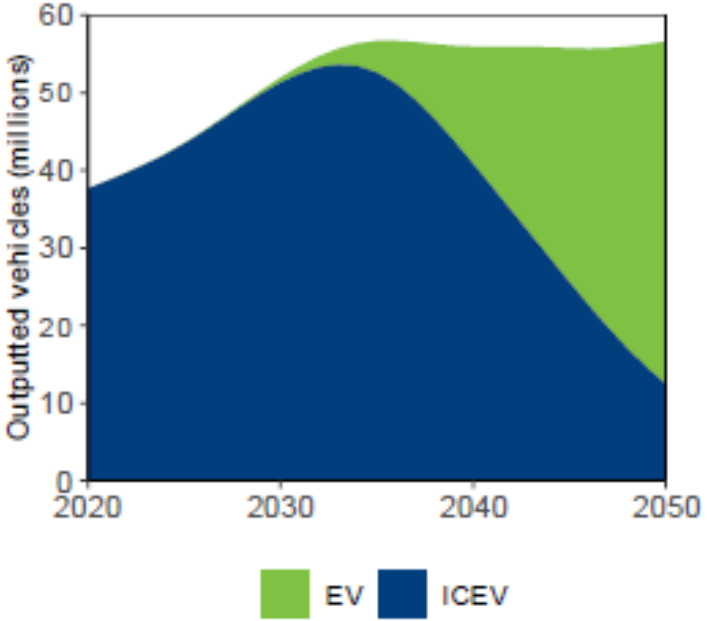
Estimated stock outflow cumulated from all major exporting regions by powertrain



Electric vehicles will increasingly become the main used vehicle that is exported, particularly from 2040.

Make up of used vehicle trade will also change

Estimated stock outflow cumulated from all major exporting regions by powertrain



Although will countries want to let EVs containing batteries (that can be re-used) and critical minerals be exported?

Electric vehicles will increasingly become the main used vehicle that is exported, particularly from 2040.

Regulating used car imports to improve fuel efficiency

Regulation can be used to improve the energy efficiency and environmental performance of used vehicle imports

Used ***Light Duty Vehicle*** Regulatory Environment Assessment (August 2021)

Regulatory Environment Assessment (UNEP)	Countries	Number in Africa
Very Good	Algeria, Mauritius	2
Good	Benin, Burkina Faso, Cape Verde, Chad, Côte d'Ivoire, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Lesotho, Liberia, Mali, Mauritania, Morocco, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Togo, Tunisia	22
Weak	Angola, Djibouti, Kenya, Namibia	4
Very Weak	Botswana, Burundi, Cameroon, Central African Republic, Comoros, Congo, Democratic Republic of Congo, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Libya, Madagascar, Malawi, Mozambique, Sao Tome & Principe, Somalia, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe	22
Banned	Egypt, South Africa, Seychelles, Sudan	4

Source: UN Environment (2021)

UN Environment has rated countries by their regulatory environment for used light (and heavy) vehicle imports.

Regulating used car imports: Part of a broader package

- UN Environment has analysed different ways of regulating used vehicle imports, including case studies in Africa – UN Environment's Jane Akumu will present on this next

- Regulating used car imports part of a broader package of measures to improve transport's energy efficiency (and reduce its adverse environmental and health impacts)

- For example, papers focusing on Ghana suggested:
  - Adoption of UN provisions for periodic technical inspections of all wheeled vehicles and fuel quality testing (Ayetor et al, 2021)
  - Transport and land-use policy reform to encourage transit-oriented development, and provision of public transport services and infrastructure for public transport, cycling and walking (Boateng and Klopp, 2022)

- Promotion of smaller, lighter electric vehicles (two- and three-wheelers, microcars) has potential to be affordable and clean option to meet mobility demand without increasing used car imports (ITF, 2023)

Photos: iStock

Main messages and resources

Main messages

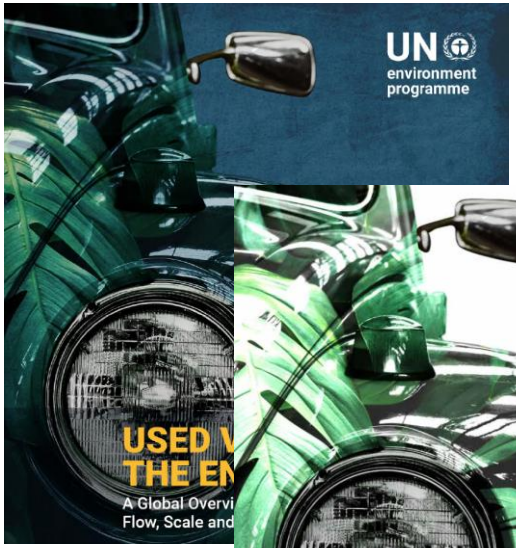
- As fossil fuels are likely to dominate transport's energy needs until 2030 (and for several years afterwards), and given the high share of imported vehicles in Africa in the increasing number of new registrations (of mainly fossil fuel powered vehicles), it will be important to take action in Africa to improve the fuel efficiency of used, imported vehicles.

- Historically, most of Africa's used LDV imports have come from Europe and Japan, although the share from both the USA and Korea is increasing; in the future, China is expected to become a big player in the used vehicle trade.

- Relatively speaking, few EVs are currently exported, although this will change as the vehicle stocks of the main vehicle exporting countries change.

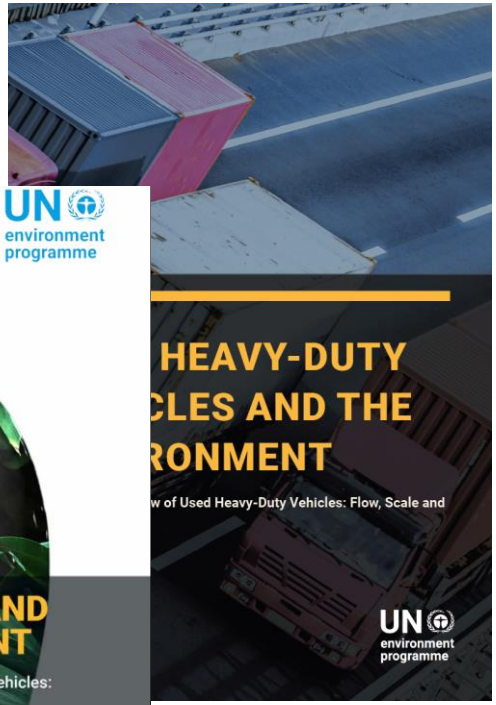
- Regulating used vehicle imports is part of a wider set of measures that are needed to improve the energy efficiency (and reduce the adverse environmental and health impacts) of transport.

Resources

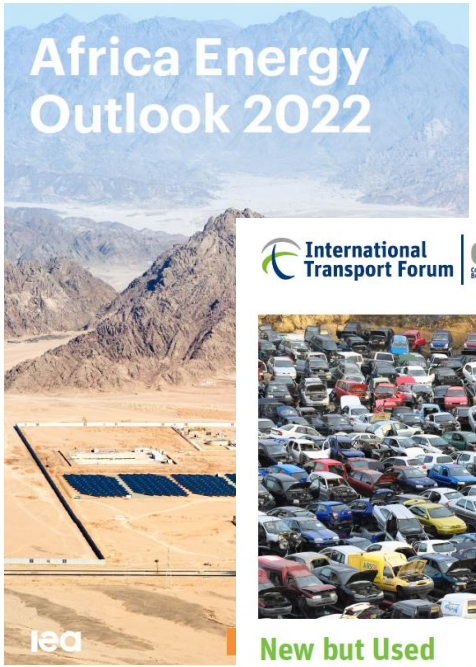


Source: UN Environment (2020)

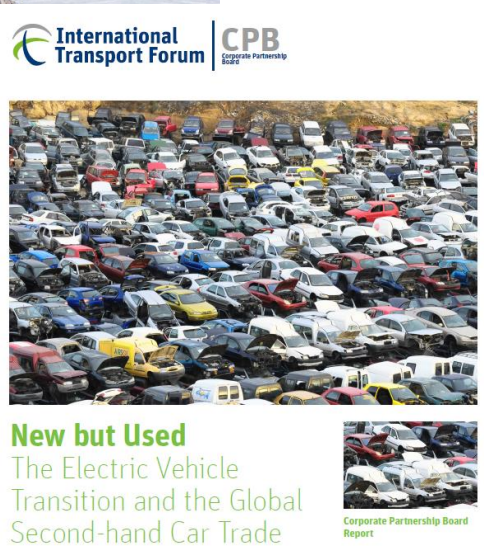
Source: UN Environment (2021)



Source: UN Environment (2024)



Source: IEA (2022)



Source: ITF (2023)

Africa Energy Efficiency Policy in Emerging Economies Training Week

Transport

Nairobi
18-21 March 2024

International Energy Agency

Transport: The role of information in improving the energy efficiency of transport
Day 2, 19 March 2024

Dr Ian Skinner, Director/Transport and Environmental Policy Research

Training roadmap

Learning outcomes

- Understand the role that information measures can play in driving forward vehicle efficiency, including:
  - Information to inform purchase decisions
    - Car labelling
    - Online databases
  - Information to support fuel efficient driving
    - Green transport programmes
    - Eco-driving programmes
    - Online tools
  - Promotion of electric vehicles, and information on their charging
  - Promotion of public transport

Information measures

Information measures help drivers and transport operators to understand the benefits of efficient *and electric* options, so encouraging them to upgrade and replace less-efficient vehicles. They can also be used to encourage more efficient purchasing and driving behaviour.

Information to inform purchase decisions

Cars

- Identified as example of good practice
- Aims to complement US Fuel Economy Standards
- Different labels for hybrid and electric vehicles

Example: US car label

[US Dept of Energy]

Includes information on costs (annual and savings compared to average car)

Information on real world performance and air pollutant emissions

Supported by more detailed information via QR code and links

Cars

- Chile first Latin American country to implement a label (2013)
- Green tax on new vehicles (2014), scaled by car's fuel economy
- Fuel economy standards (2022), including target for 100% zero emission vehicles sold (2035)

Example: Chile car label

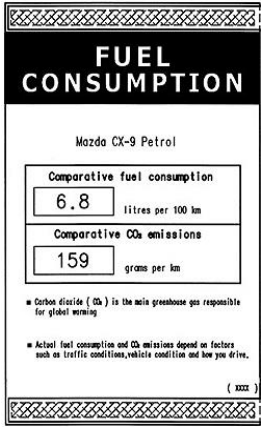
Includes information on CO_2 emissions, fuel economy in different circumstances (city, inter-urban, combined)

Start of the development of Chile's vehicle efficiency policy framework

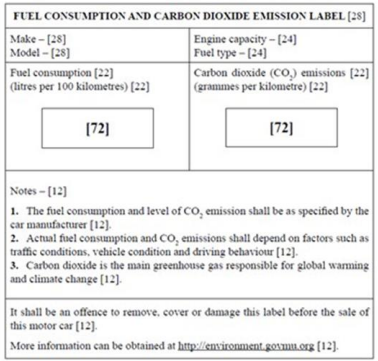
GFEI; ICCT, 2022

Fuel labels in Africa

- South Africa:
  - Introduced in 2008
  - Joint initiative of South African government and manufacturers' association (NAAMSE)
  - Requires presentation of fuel economy (combined) and CO_2 emissions



Source: GFEI, South Africa Department of Energy



FUEL CONSUMPTION AND CARBON DIOXIDE EMISSION LABEL [28]

Make – [28] Model – [28]	Engine capacity – [24] Fuel type – [24]
Fuel consumption [22] (litres per 100 kilometres) [22] [72]	Carbon dioxide (CO_2) emissions [22] (grammes per kilometre) [22] [72]

Notes – [12]

1. The fuel consumption and level of CO_2 emission shall be as specified by the car manufacturer [12].
2. Actual fuel consumption and CO_2 emissions shall depend on factors such as traffic conditions, vehicle condition and driving behaviour [12].
3. Carbon dioxide is the main greenhouse gas responsible for global warming and climate change [12].

It shall be an offence to remove, cover or damage this label before the sale of this motor car [12].

More information can be obtained at http://environment.govmu.org [12].

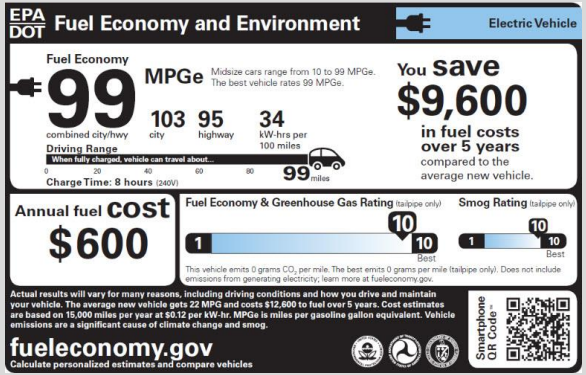
- Mauritius
  - Introduced in 2019
  - Requires presentation of fuel economy and CO_2 emissions
  - Supported by fuel efficiency communication campaign involving car dealers

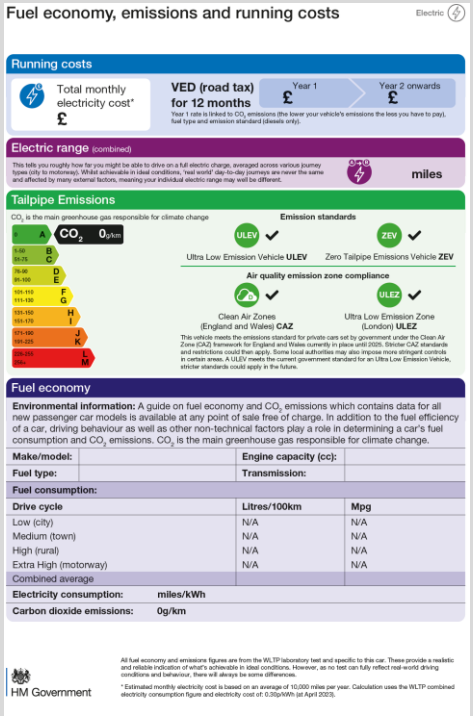
Source: GFEI, Government of Mauritius

Cars

- Tend to follow the same format as those for petrol/diesel cars, but with different information (e.g. driving range)
- Challenges of overcomplicating the message if a single label used for all fuel types

Example: Electric car labels





US Dept of Energy; UK VCA

Cars

- Global first
- EVs sales accounted for 9.5% of sales in 2022

Example Korea efficiency label for Electric Vehicles

Allows potential buyers to identify most efficient electric vehicles

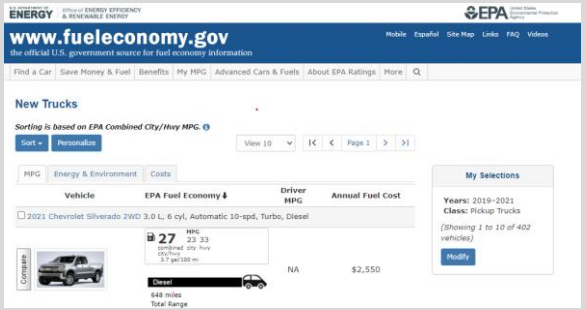
Rating system implemented in September 2023 and label displayed in vehicles sold in Korea from April 2024

IEA, EEMR, 2023

Light trucks

- Linked to US fuel economy standards and label
- Also available for cars and electric vehicles
- Presents data based on fuel economy, emissions and costs

Example: US national comparison site



Allows potential buyers to identify most fuel efficient vehicles by category

Aim is to enable potential buyers to compare models, and also to identify best (and worst) performing vehicle per category

US EPA

Information to support fuel efficient driving

Trucks

- Programmes in both countries draw on US and Canadian experience with *SmartWay*
- One of Argentina's is government run, other programmes run by private sector (e.g. truck operator associations)

Example: Green Freight programmes, Argentina and Brazil

Photo: iStock

ICCT, 2021

Involves sharing of best practice and training, including on eco-driving

In Brazil, drivers reported average fuel savings of 24%

Argentina's, *Programa Transporte Inteligente*, aims to reduce fuel consumption in freight sector by up to 30%

Trucks

- National truck driver training includes eco-driving
- Ministry working with municipalities on eco-driving campaigns for bus drivers

Example: Fuel efficient driving requirements for truck and bus drivers, Peru

Photo: iStock

Fuel savings of up to 17% (average 7%)

Incentives, and on-road training, also considered to be important

Eco-driving techniques reinforced on licence renewal (every 3 years)

ICCT, 2021

Cars

- National, regional or local campaigns to communicate fuel-efficient driving technology
- Can communicate to drivers in general, or fleet drivers, specifically

Example: Eco-driving campaigns

Photo: iStock

Potential fuel (and cost) savings of up to 30%

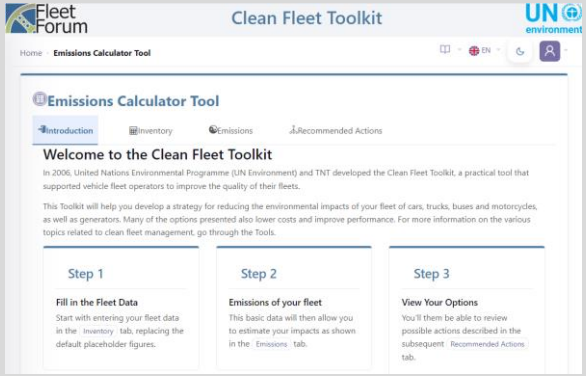
Techniques include steady speeds, gentle acceleration and deceleration, anticipate traffic

Campaigns should be long-term, emphasise all benefits, include training; integrate into new driver training

Fleet vehicles

- Aims to provide fleet owners with insights on their current fuel use, emissions and costs
- Provides suggestions as to actions that might be taken to reduce emissions and improve fuel economy

Example: UN Environment Clean Fleet Toolkit



Fleet emissions calculator

Information on adverse impacts of fuel use

Tips on journey management, eco-driving and vehicle maintenance

UN Environment

Promotion of electric vehicles (EVs), and information on their charging

Private vehicles

- National “Go electric” campaign launched in February 2021
- Various states have, or are planning to, implement state-level campaigns

Example: Electric vehicle awareness campaigns, India

SWITCH DELHI

Delhi instigated ‘Switch Delhi’ in 2021; website also contains EV comparison tool, cost saver tool and charging point finder

Telangana developing an app (for EV charging locations), planning an extensive promotion campaign

West Bengal considering EV awareness campaigns, dedicated EV awareness web portal and app (charge point locations, journey planner)

Private vehicles

- Joint government industry national campaign
- Ran from 2014 to 2021
- Also provided funding for “exemplar” cities

Example: UK’s Go Ultra Low campaign

UK Government, 2018; EST, 2021

Website with information on EVs and cost calculators (on cost savings, car tax, journey range and home charging)

Adverts (online, press, radio)

Specific campaigns, e.g. videos and content demonstrating EV drivers’ personal experience

Financial support for cities to roll out EV charging infrastructure and promote EVs; lessons shared

EV awareness campaigns can take various forms

- Shanghai (China):
  - EV Demonstration city, which include an EV Demonstration Zone where business and individuals learn about EVs and take test drive
  - Supported by manufacturers, universities, national electrical grid and national government

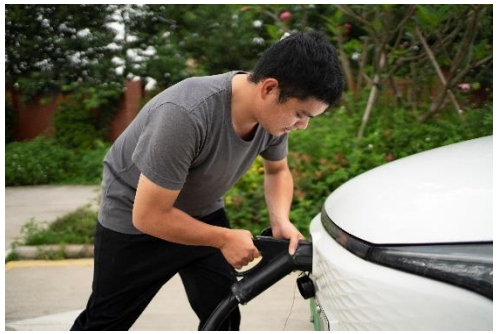


Photo: iStock

Photo: City of Amsterdam

- Amsterdam (Netherlands):
  - Promotional campaign, “Amsterdam elektrisch”, which included electric vehicle events
  - Integration of electric buses and taxis at the Schiphol Airport, which was well publicised
  - Comprehensive city website with real-time information about the city’s charging network

ICCT, 2018

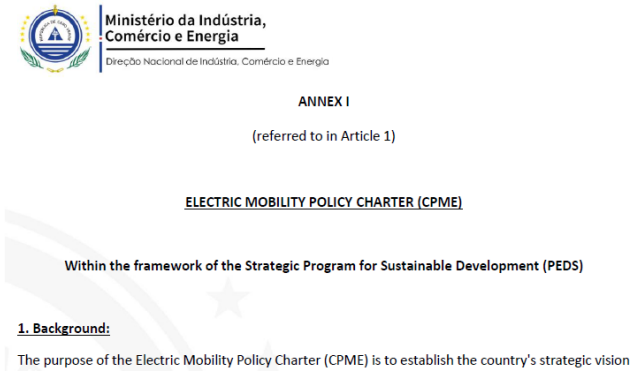
EV awareness campaigns are being considered in Africa

- Kenya has recognised the importance of awareness raising to increase uptake of e-mobility

MINISTRY OF ENERGY

Kenya National Energy Efficiency and Conservation Strategy

- Cabo Verde's Electric Mobility Policy Charter (2019) included development of public education campaigns to highlight positive aspects and benefits of electric mobility


Ministério da Indústria, Comércio e Energia

Direção Nacional de Indústria, Comércio e Energia

ANNEX I

(referred to in Article 1)

ELECTRIC MOBILITY POLICY CHARTER (CPME)

Within the framework of the Strategic Program for Sustainable Development (PEDS)

1. Background:

The purpose of the Electric Mobility Policy Charter (CPME) is to establish the country's strategic vision

- Ghana's National Electric Mobility Roadmap includes the development of a roadmap on "EV awareness creation and campaigns"

UN environment programme | copenhagen climate centre

supported by UNOPS

CTCN CLIMATE TECHNOLOGY CENTRE & NETWORK

National Electric Mobility Roadmap in Ghana

Electric cars

- Municipal authority supported the campaign with purchase and charging subsidies, as well as free parking and a reserved parking space for EVs.
- Municipal authority also supported the development of a public and private charging infrastructure network

Example: Citizen electric car test drive campaign, Liuzhou (China)

Photo: iStock

Local car manufacturer offered test drives for an electric microcar

Participants encouraged to provide feedback to both the manufacturer and the city authorities

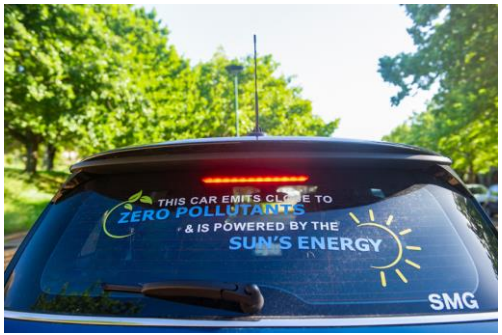
Of 15,000 participants, 70% opted to buy an electric car after the test drive

As a result, 10% of new cars sales in the area were electric in 2017

IEA, 2021

High profile test drives, acquisitions, EV experience centres in Africa

- High profile test drives, such as University of Cape Town's Vice Chancellor, accompanied by an out-reach programme



- High profile acquisitions, such as the UN in Nairobi

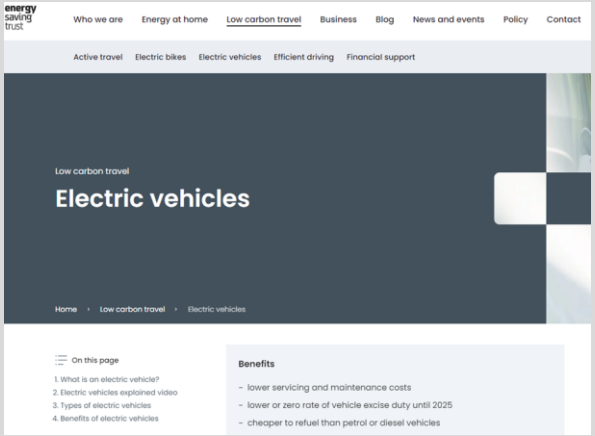
- Electric Vehicle Experience Centres, such as Africa's first in Nigeria, which allows people to test drive different EV models

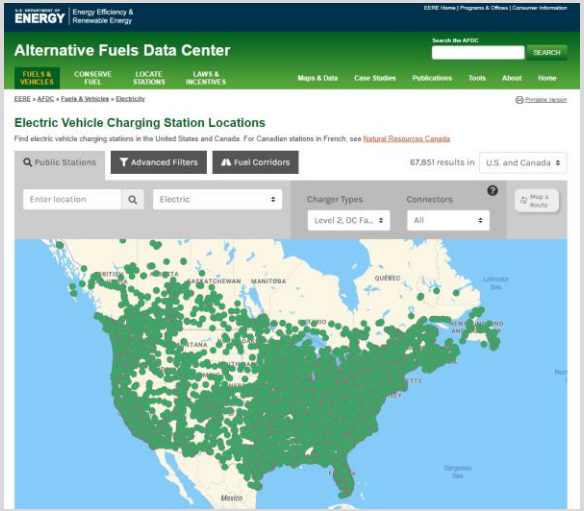
Photos: UCT, UN Environment, istock

Private vehicles

- General information helps to inform consumers of the benefits and differences of electric vehicles
- Information on charging points across the country helps consumer confidence on long-distance journeys
- There are also commercial / non-governmental apps

Example: General information and charging on long-distance journeys





UK Energy Savings Trust; US Department of Energy

Promotion of public transport

Buses

- Lagos Metropolitan Transport Authority (LAMATA) created in 2002; responsible for coordinating policies and programmes, strategy and overseeing major investments
- Supported by World Bank

Example: Developing Lagos' public transport system

[International Growth Centre](); image: [Lamata]()

Generating buy-in and public communication important to gain public support for public transport reform

Link between higher taxes and better infrastructure emphasised since early 2000s

LAMATA has active public relations strategy and holds regular community meetings, normalising citizen engagement

Won over unions by sponsoring visits to cities abroad where new public transport systems implemented

Public transport

- TfL's campaign was launched in 2011
- Aim to engage customers and also generate a cultural change within the organisation

Example: Transport for London 'Every Journey Matters'

Source of image: Transport for London

Customer-focused approach to information provision and communication

Communicating consistently, in real-time, with empathy and with personalised information linked to users' habits

Also aims to promote London's public transport as a green travel alternative

Buses

- UITP (International Union of Public Transport) has resources to help operators and authorities promote public transport
- Focuses on the benefits of public transport

Example: Promoting the benefits of public transport

UITP

Public transport can be promoted through various means, such as brochures, posters, social media

Environmental benefits focus on reductions in air pollution, CO_2 emissions and noise; improved quality of urban life

Other benefits include: improved accessibility and affordability; contribution to healthy, active lifestyles; connecting people to jobs; generating local jobs

Public transport

- Full electrification of Bus Rapid Transit line 3 in Mexico City
- 60, 18-metre articulated buses, with range of 330 km
- Supported by installation of charging points at the depot to charge buses overnight

Example: Promotion of new electric buses, Mexico City

Publicity surrounding the opening of the charging installations in the depot, and launch of the service (attending by local officials)

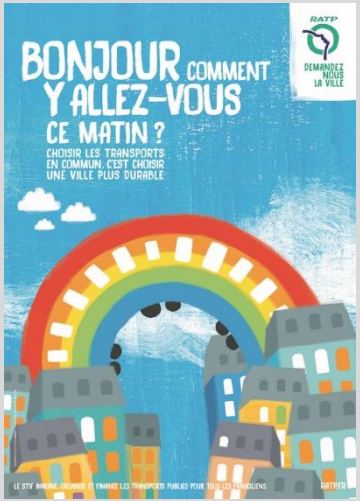
Publicity on the vehicles: “Soy Electrico”

Source of images: Metrobús

Public transport

- Posters can emphasise speed, alternative use of time, green credentials
- Posters often developed by marketing specialists

Example: Promotion of public transport



Sources: Do it on the Bus; others

Main messages

Main messages

- Information measures can take many forms

- Car labels can support other measures aiming to improve vehicle efficiency, such as fuel economy standards and incentives

- General – or targeted – fuel efficient driving campaigns can result in fuel (and cost) savings for companies and individuals

- Electric vehicle awareness campaigns are important to communicate the differences (and benefits) of the technology to consumers

- Public transport can be promoted in many ways, and is important to improve transport efficiency, as it is a very efficient means of moving people around a city

Interactive session: Two options!!

- Option 1: You have been given the role of setting up a new efficiency label for cars, to be displayed on-line and in car showrooms
  - What information would you include and why?
  - How could the information provided differ on-line?
  - What do you think the key challenges would be in developing the label?
  - How could these be overcome?

- Option 2: You have been given the role of promoting buses in your city with your city planning to introduce new buses next year.
  - To whom would you promote buses, and how?
  - What might your key messages be?
  - How would this change for electric buses?

Africa Energy Efficiency Policy in Emerging Economies Training Week

Transport

Nairobi
18-21 March 2024

International Energy Agency

Making it Happen: Incentives

Dr Alison Pridmore, IEA

Training roadmap

Learning outcomes

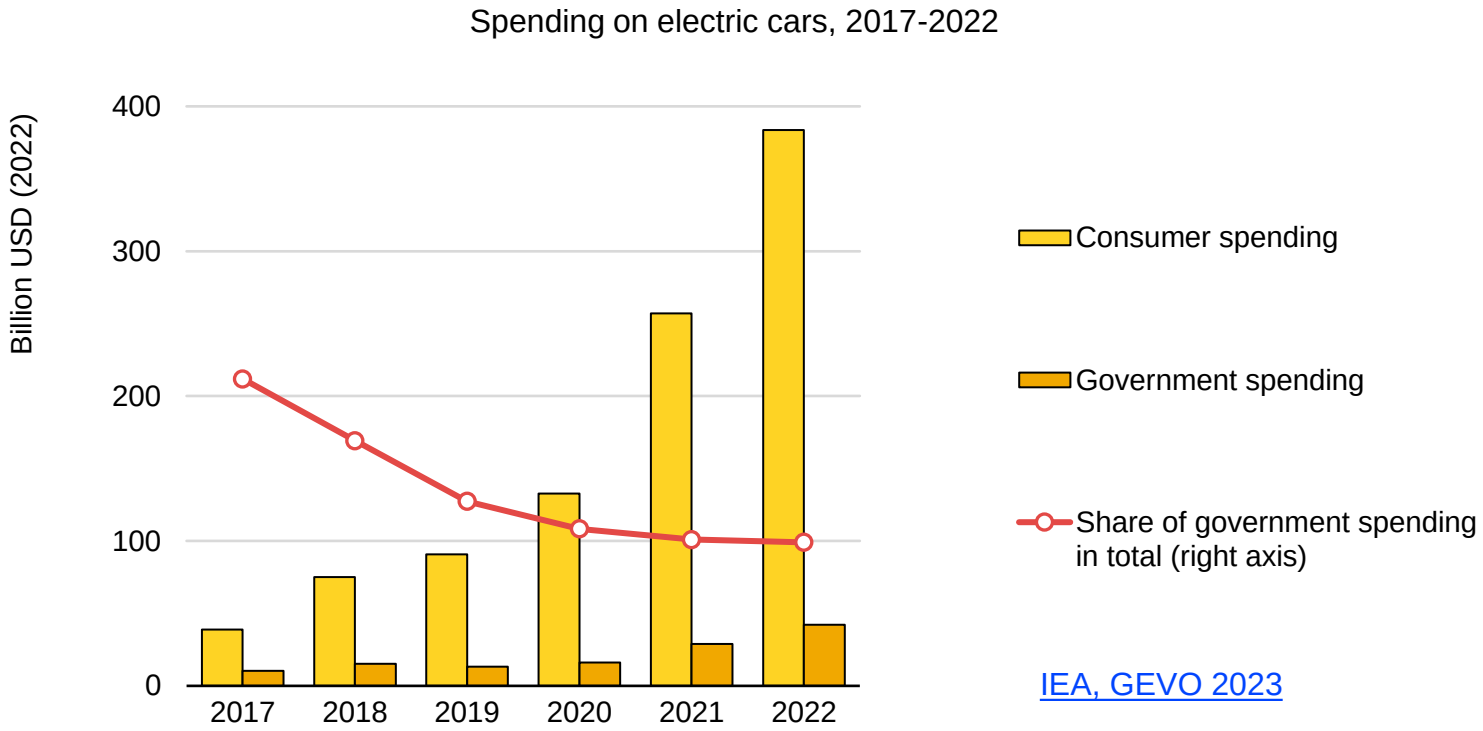
- Understand the role that incentives can play in driving forward vehicle efficiency
  - Upfront incentives – for consumers and companies
    - Electric vehicles
    - More efficient vehicles
    - Evolution of incentives over time
  - In use incentives
    - Exemptions and access
    - Free parking reductions
  - Industry incentives
- Role of incentives as part of a strategy
- Consider the strengths and limitations of incentives

Incentives

Incentives make efficient options more attractive and speed up the upgrade and replacement of vehicles. They also encourage the use of new technologies and practices.

Cars

Sustained policy support underpins EV growth

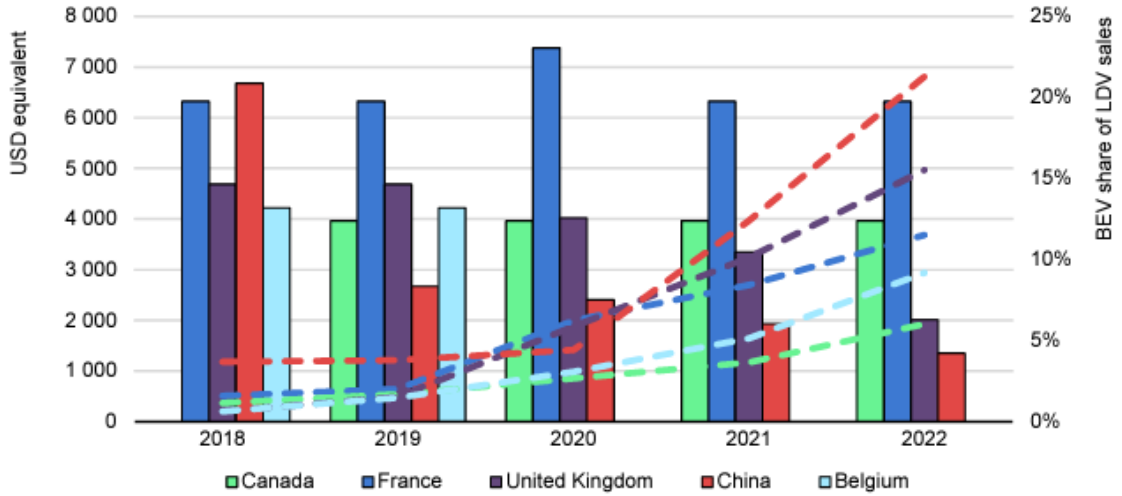


IEA, GEVO 2023

Global total spending on electric cars reached USD 425 billion in 2022, with the share of government support in total spending around 10%.

Evolution of incentives over time

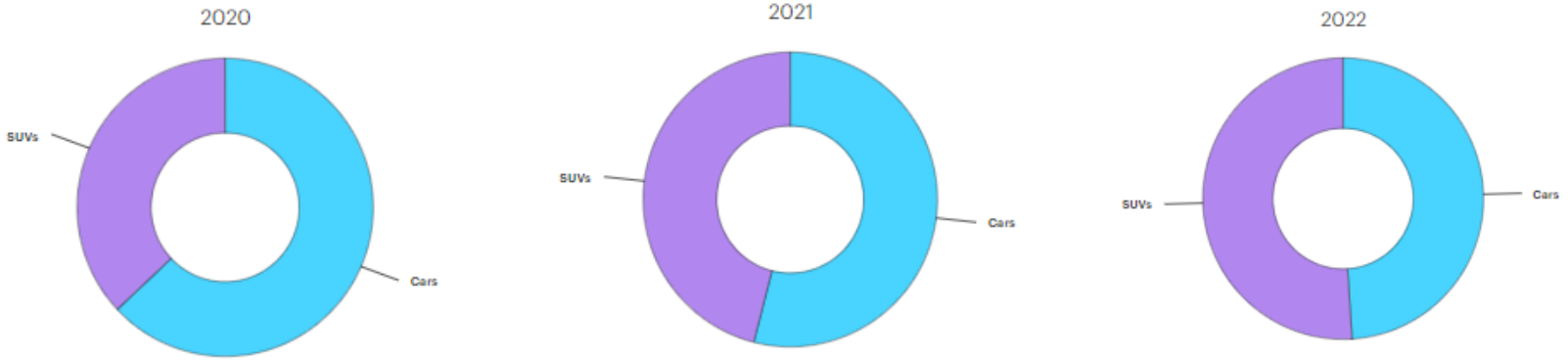
Battery electric vehicle incentives and the battery electric vehicle share of light-duty vehicle sales, 2018 - 2022



IEA, GEVO 2023

Suvisation of the (electric) vehicle fleet

Electric car sales by segment



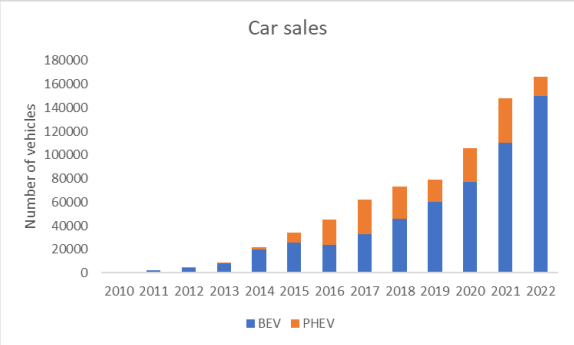
IEA, 2023

Globally over 50% of electric cars sales are now SUVS

Cars

- World leader in EV market share
- Upfront and in-use policies
- Evolution of policies over time

Example: Norway evolution of EV incentives over time



IEA, 2023

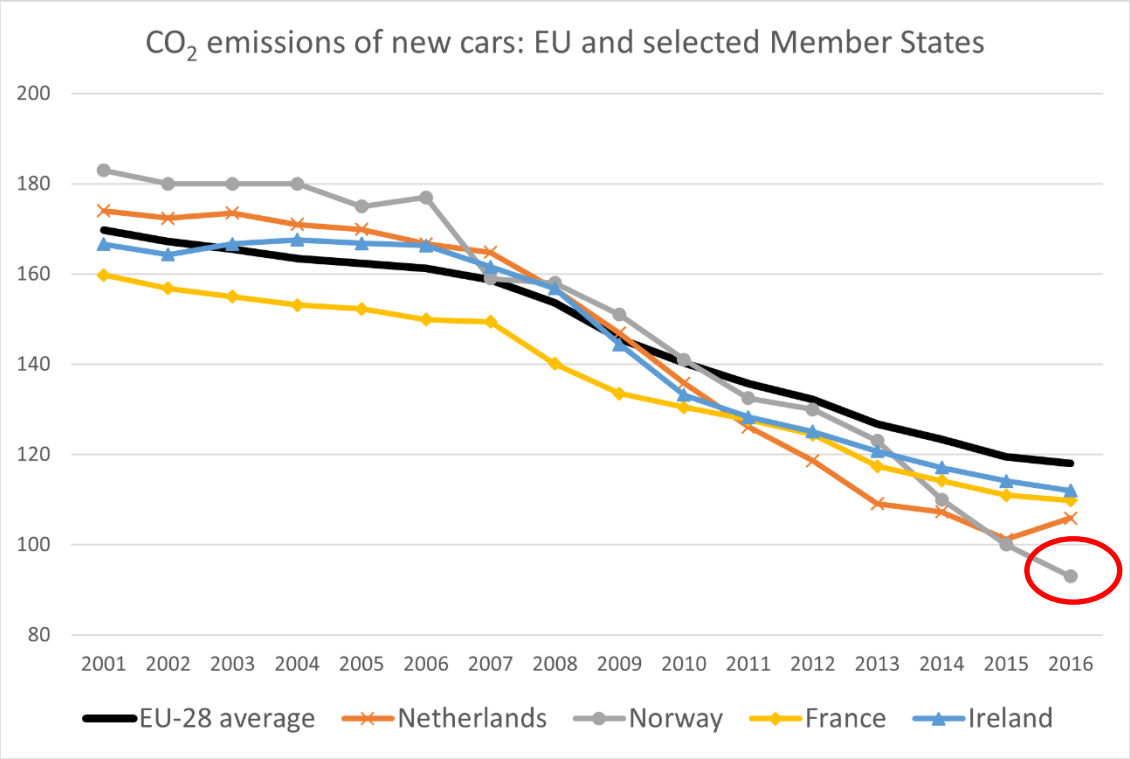
88% of new vehicle sales are EVs

Tax exemptions (historic) made EVs cheaper than ICEs

No charges (historic) for road tax, toll roads, and parking

Weight and price based taxes introduced from 2023

Well-designed incentives can further complement standards



Long term set of incentives has enabled **Norway** to significantly improve its average CO_2 emissions.

Developed from EEA, 2018

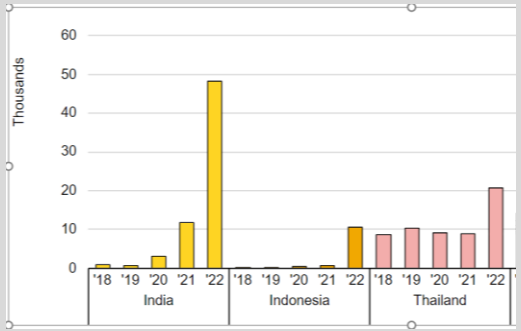
Incentives can improve the rate of improvement of a country's per vehicle CO_2 emissions/fuel economy in markets with fuel economy standards.

Cars

- Role of financial package approach
- Incentives – manufacturers and consumers

Example: Thailand's introduction of incentives

Electric car sales



IEA, 2023

Thailand approved a financial incentives package in 2022

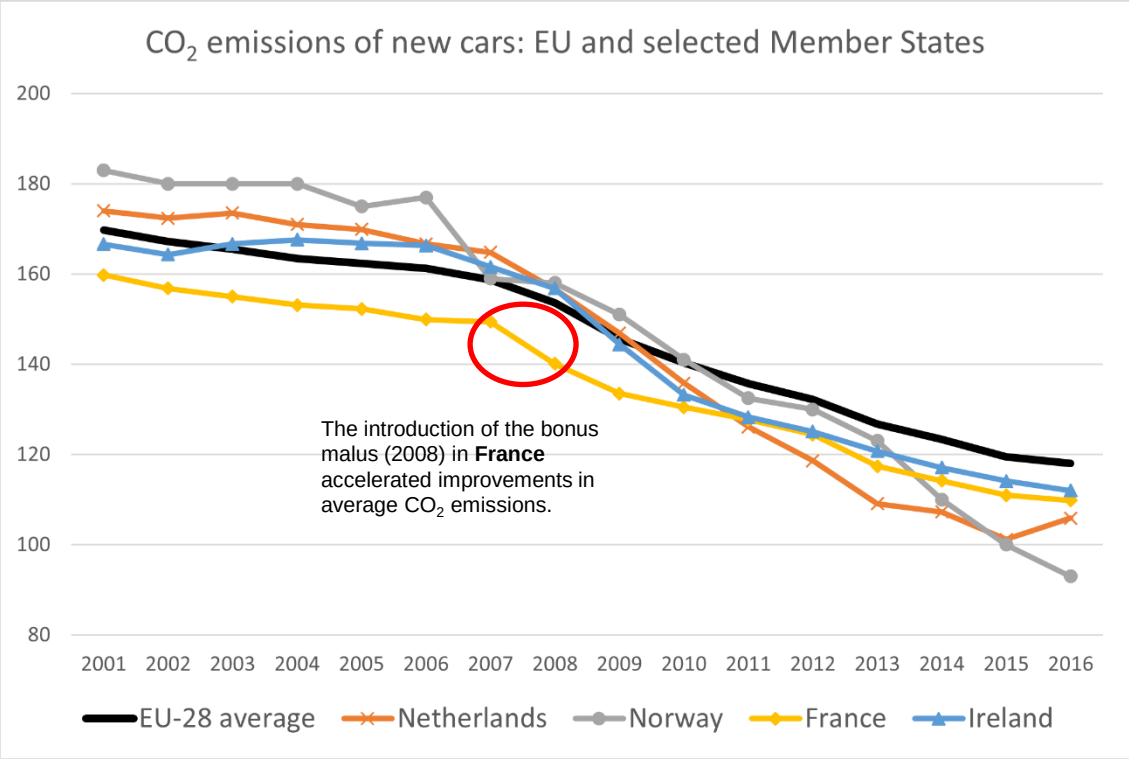
Subsidies of between USD 2 200 and 4 600

Excise tax will be reduced to 2% from 8%

Exemptions on import duties

ASEAN Centre for Energy 2023

Well designed incentives can further complement standards



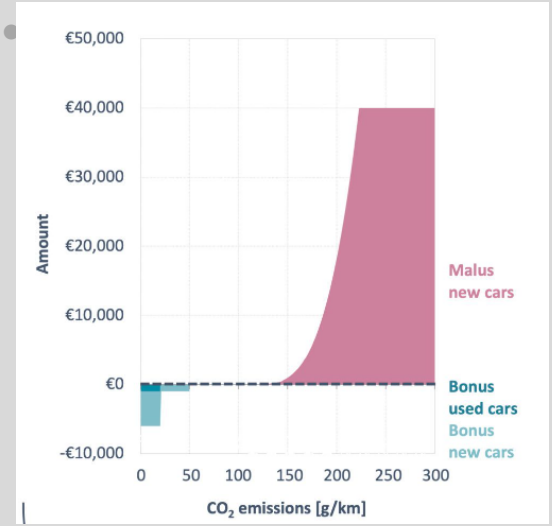
Developed from EEA, 2018

Incentives can improve the rate of improvement of a country's per vehicle CO_2 emissions/fuel economy in markets with fuel economy standards.

Cars

- Can be revenue neutral
- Malus can be set against CO_2 emissions / weight
- EVs registrations can increase

Example: Bonus malus in France



ICCT, 2022

France has highly efficient car and van fleet

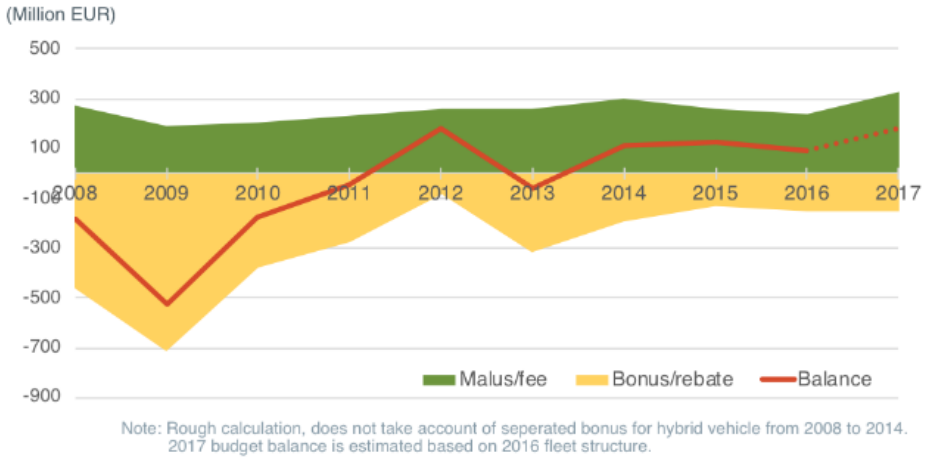
Scheme in place since 2008 and has evolved time

Feebate now uses continuous function

Revenue neutral adoption of electric vehicles

Evolution of incentives over time

Revenue and Cost of France Bonus-Malus scheme



ICCT, 2018

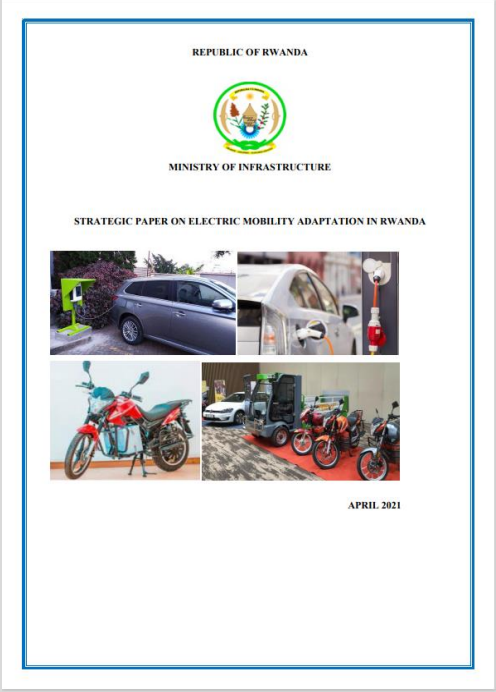
Importance of move from stepwise to continous function

Role of a multi-layered approach

Cars

- Upfront and in-use policies
- Fiscal and non-fiscal approaches
- Covers multiple modes

Example: Rwanda's approach


REPUBLIC OF RWANDA

MINISTRY OF INFRASTRUCTURE

STRATEGIC PAPER ON ELECTRIC MOBILITY ADAPTATION IN RWANDA

APRIL 2021

Fiscal exemptions – VAT, witholding tax and import duty

Local production promotion

Low charging costs

Provision of land on a rent free basis

Green license plates

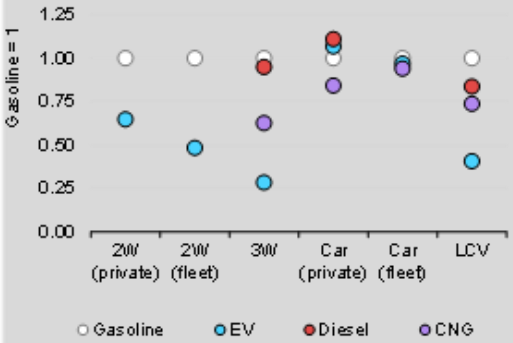
Two and three wheelers

Two and three – wheelers

- Action at National and City level
- New business models have facilitated change
- Role of supply and demand side incentives

Example: Incentives for EV 3- wheelers India

- India TCO Comparison by segment 2022



IEA and Niti Aayog, 2023

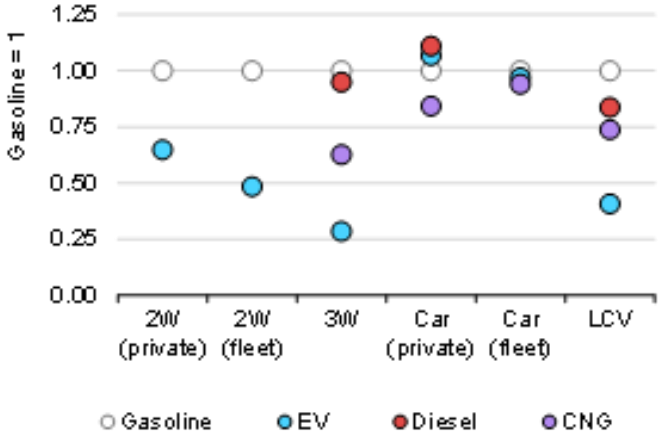
55% of India's three-wheeler registrations in 2022 were electric

Policies include purchase incentives under FAME II, tax benefits, India's Go Electric campaign

TCO analysis suggest electric three-wheelers are 70% cheaper

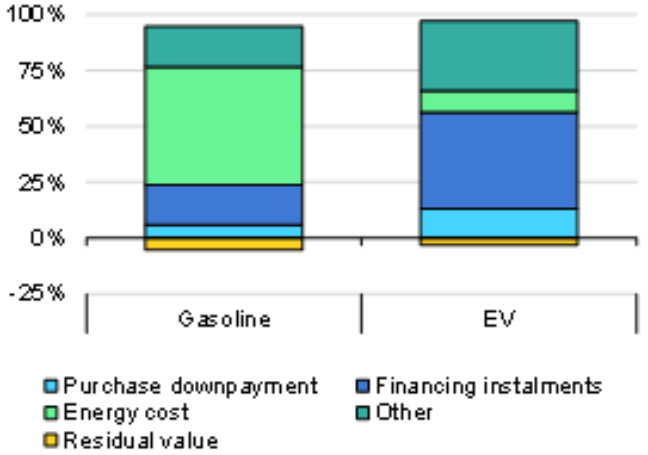
Cost comparison illustrating role of incentives

India TCO Comparison by segment 2022



[IEA and Niti Aayog, 2023]

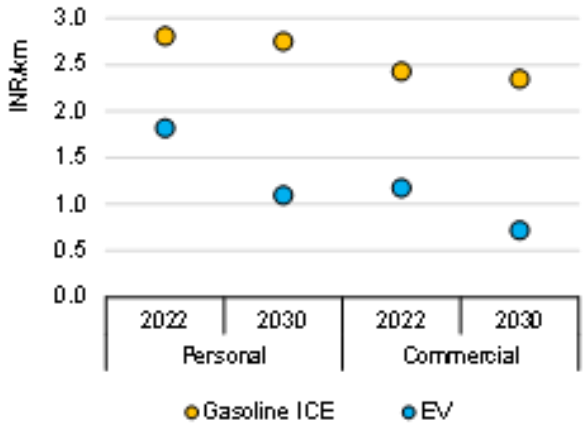
India TCO cost components for scooters 2022



[IEA and Niti Aayog, 2023]

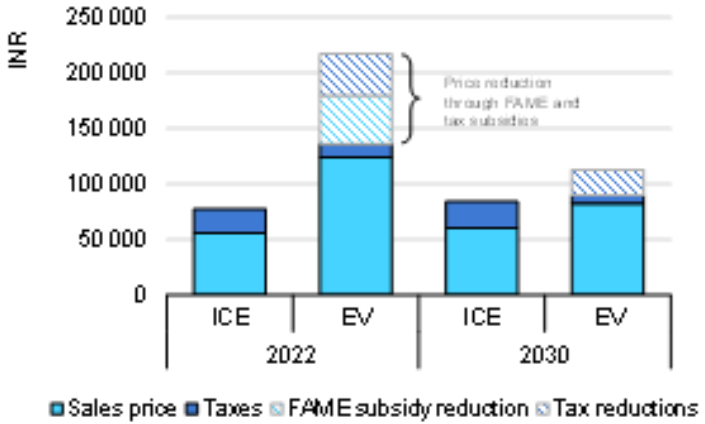
Cost comparison illustrating role of incentives

India TCO 2022 and 2030



IEA and Niti Aayog, 2023

India TCO 2022 and 2030



IEA and Niti Aayog, 2023

Trucks

Trucks

- Stimulate battery electric truck market
- Purchase incentive (80% of difference in cost with diesel truck)
- 100% reduction in road tolls for battery electric trucks
- Carbon pricing for transport

Example: Incentives for battery electric trucks, Germany

Photo: iStock

Over 3,000 new battery electric trucks in Germany between 2019 and 2022

Over 70% of EU's new electric trucks registered in Germany (2019-22)

Policies expected to bring costs in line with those of a diesel truck

IEA analysis based on ACEA data; policies from ICCT, 2021

Trucks

- Air quality and road safety key drivers for change
- Importance of testing centres and scrappage yards
- Importance of removing barriers to finance

Example: Vehicle scrappage of trucks in India

Older vehicles required to pass “fitness test”

Vehicles failing are defined as end-of-life and lose registration

Air pollution reduction of 11-17 %

Scrap value, tax offer, rebate

Future opportunities for multiple inspections

Source: Business Today

City access requirements

Multi-modal

- Air quality and congestion motivations
- Increasing focus on phase out of ICEs
- Role of scrappage schemes

Example: City level action

- In France, the government requires the adoption of LEZs in all municipalities with more than 150 000 inhabitants by 2024.
- Milan has banned older petrol and diesel vehicles from entering the city during weekdays, subject to a fine, with only the cleanest vehicles permitted by 2030.
- Spain has mandated LEZs in municipalities with more than 50 000 inhabitants, covering 70% of Spanish cities

Electrification and modal shift opportunities

Buses

- National e-mobility strategy
- Air pollution key driver for change
- Unified public transport systems
- Minimum quota for electric buses

Example: Electric bus adoption in Santiago, Chile

By 2023 over 1, 700 e buses – the largest in Latin America

User favourability rating of 90%

Energy costs are 75% cheaper than diesel

C40, 2020

Buses

- Mobilisation of private capital and partnerships
- Solar power used
- High capacity buses
- Bus lanes

Example: Electric BRT, Dakar Senegal

BRT halves commute time

Accessible

WiFi and usb charging

170,000 jobs new jobs within reach

Interactive session

- Please split into four teams:
  - Your Government is keen to encourage the adoption of more fuel-efficient vehicles.
    - Your team is in charge of developing an incentive package:
      - What incentives would you include in this package?
      - How would these incentives change over time?
      - How could these incentives be made more fiscally neutral?

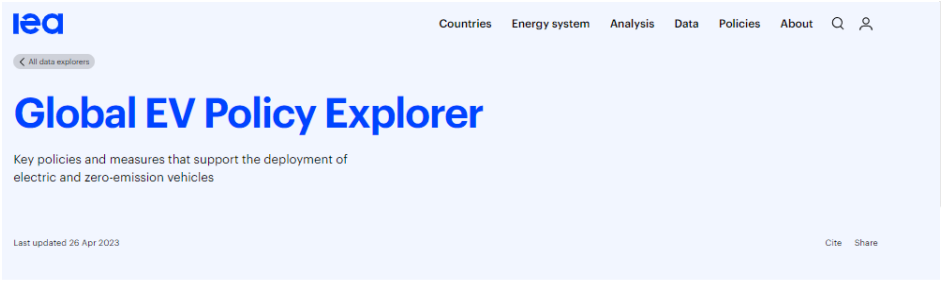
Additonal discussion points

Impacts of selected behavioural changes in the NZE Scenario and similar existing measures

Measures in NZE Scenario	Global impact in NZE Scenario in 2030	Selected measures and their impacts
Low car cities	Reduction in private car activity by up to 15%.	• London: 18% reduction in private car travel with ultra-low-emissions zones. • Paris: 45% reduction in car journeys since 1990.
	Reduction in total road transport CO_2 emissions by 5%.	• Milan: 35% reduction in local CO_2 emissions with low-emissions zones.
	Increase in public transport.	• London: 33% increase in bus travel with ultra-low-emissions zones. • Madrid: 9% increase in public transport use with low-emissions zones.
	Private car sales reduced by 9%.	• United States: around 4% decrease of vehicle sales per capita following shared mobility schemes.
	Improved well-being from: • More active transport • Less congested roads • Lower noise and air pollution • Improved health and safety.	• Jakarta: 1 000% increase in cyclists related to 300 km of new cycle lanes. • London: 30% less congestion with ultra-low-emissions zones. • Milan: 18% reduction in particulate and NO_x pollution with low-emissions zones; 24% decrease in road casualties.
Shift short-haul flights to high-speed rail	Reduction in CO_2 emissions from domestic aviation by 2%.	• France: 3% reduction of CO_2 emissions from domestic aviation with ban on short-haul flights (estimated); 77-times less CO_2 emissions per passenger on impacted routes.
	Reduction in noise and air pollution.	• United States: 3 500 tonnes of harmful pollutants avoided through the California High-Speed Rail Authority Project when in operation.
Avoid flights for business when not necessary	Reduction in long-haul flights for business purposes by 43%.	• China: 26% reduction in business trips compared to pre-Covid pandemic levels (survey). • Brazil: 44% reduction in business trips compared to pre-pandemic levels (survey).

IEA, 2023,
World Energy Outlook 2023 – Analysis - I

Incentives



Explore key policies and measures for EV deployment

The table highlights current as well as announced key policies and measures that support the deployment of electric vehicles (EVs) and zero-emission vehicles (ZEVs) by region and country. These policies and measures take a variety of forms, e.g. fuel economy standards, CO_2 emissions standards, deployment roadmaps, and sales or stock targets and ambitions.

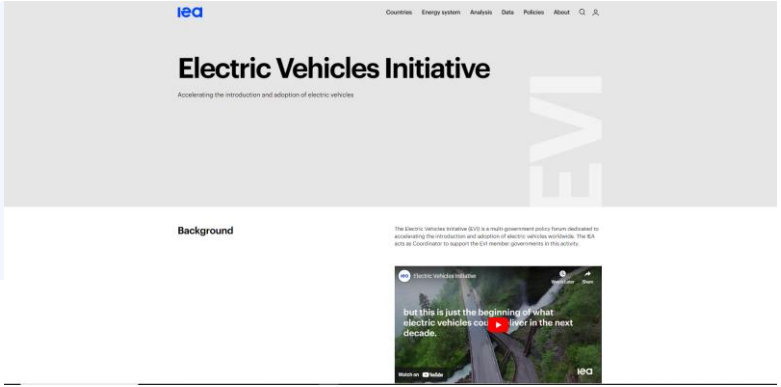
The policies and measures listed in the table are structured in four types:

- **Legislation**: legally binding commitments such as regulations and standards.
- **Proposals**: policies or actions that have been formally proposed and that may form part of a future policy or target.
- **Targets**: announced government targets, for example those incorporated into legislation, budgetary commitments, national climate plans, or electric vehicle strategies.
- **Ambitions**: government goals or objectives (also known as unofficial targets) as set out in a policy document such as a deployment roadmap or strategy, often without specific targets.

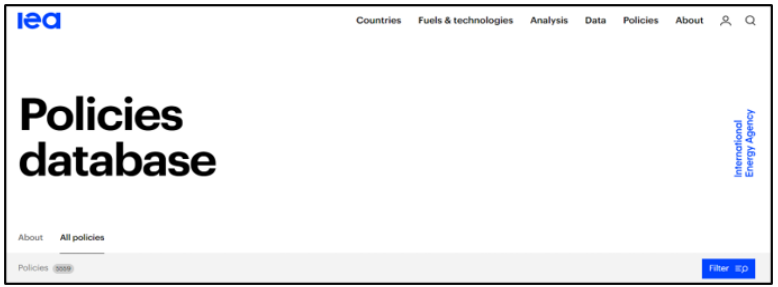
These policies and measures can be searched across nine different categories:

- **LDV**: light-duty vehicle (cars and vans)
- **M/HDV**: medium/heavy-duty vehicle (freight and vocational vehicles)
- **EVSE**: electric vehicle supply equipment (charging infrastructure)
- **2/3W**: two or three wheelers (motorcycles and rickshaws)
- **Bus**: bus or road public transport policy
- **Manufacturing**: applies to manufacturing of EVs and related components
- **Taxation**: applies specifically to duties and taxes
- **Multiple**: equally applies to multiple categories

IEA, 2023



IEA, 2023



IEA, 2023