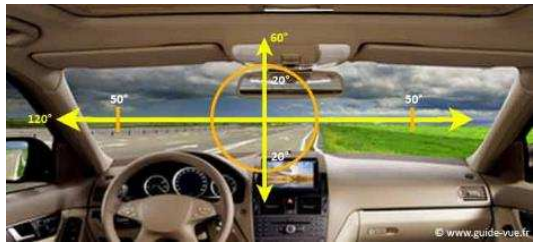
Vous avez dit réglementation véhicules ?

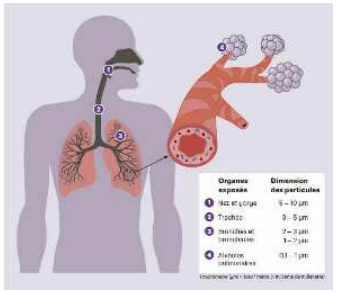
A. Burlacot – Janv 2023

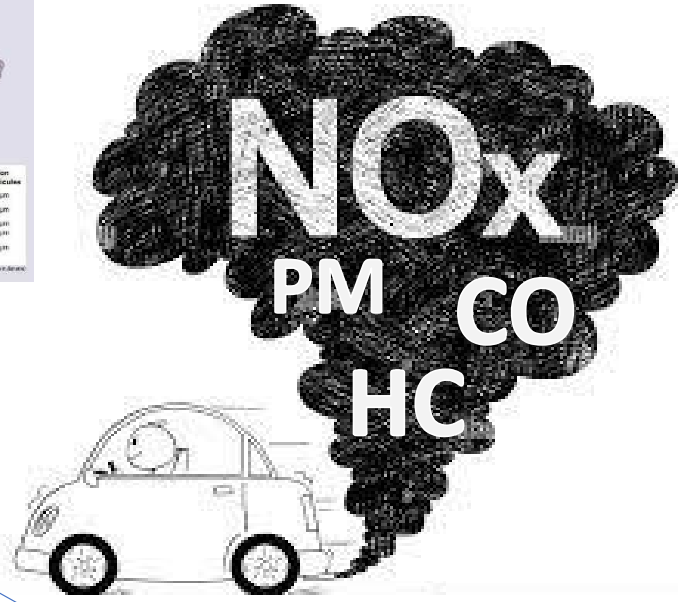
Key types of regulations

Direct safety issues, immediate or mid-term



Human Health safety mid-term



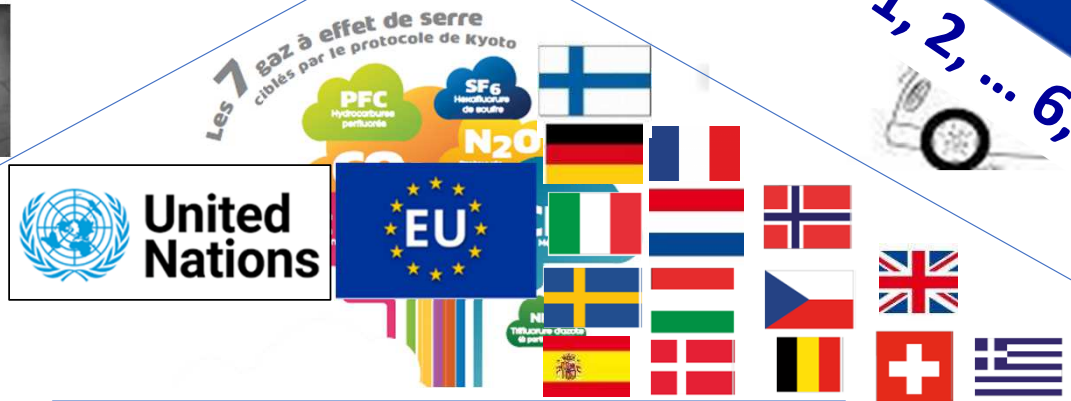


Mid & Long-term environmental issues

Key types of regulations

Direct safety issues, immediate or mid-term

Human Health safety mid-term



Mid & Long-term environmental issues

Key types of regulations

Direct safety issues, immédiate or mid-term

Direct safety regulations

UNECE : United Nations Economic Commission for Europe (Geneva)

Established in 1947

- To help rebuild postwar Europe,
- To develop economic activity with the rest of the world,
- To assure a relevant common minimum safety level for the population.
- Today : 57 countries in the 1958 agreements.

1958 : mutual homologation recognition

1960 : R1 = first regulation on headlamps

2018 : Special organization setup to deal with Autonomous vehicles (GRVA).

2022 : R164 = Studded tyres

Direct safety regulations

United Nations

1960	1970	1980	1990	2000	2010
Head lamps	Belt anchorage	Child restraint syst.	Daytime lamps	Comp. Natural gas	Led lights
Braking	Seat	Headlamp cleaner	Speed limitation devices	Replacement Airbag	Child restraint sys.
Retro-reflecting	Interior fittings	Rear-view mirors	Side marker lamps	Tyre noise, wet grip…	Lane departure warning
Direction indicator	Reversing lamp	Sound Level	Front underrun devices	Fire resistance inter.	Emergency braking
Position, stop lamps	Headrest	Silencing system	Occupant protect. in a lateral collision In a front collision	Forward field vision	Hydrogen safety
Door latches	Extern. projection	Temp. spare tyre	Gas-discharge lights	Hand controls	Bake assistance
Steering device under impact	Warning triangle	LPG equipement	Battery electric vehicle safety	Adaptive Front light	Electronic stability
	Audible Warnings	Parking lamps	Retreaded tyres	Passengers protect against luggage	TPMS
	Tyres	Steering equipt		Wheel replacement	Emergency call
	Fire risks	Seats & anchorage		Pedestrian safety	Fuel syst. integrity
	Filament lamps				Cybersecurity
	Speedometer				Automated lane keeping
	Safety glazing				Event data record

UN (more than 150 regulations)

Direct safety regulations

Regulation is continuously completed to assure safety of technical innovations use

- Autonomous vehicles,
- Cyber security,
- UPTIS (Unique Puncture-Proof Tire System)

...

Key types of regulations

Human Health safety mid-term

Public health : EURO 1, 2, … 6

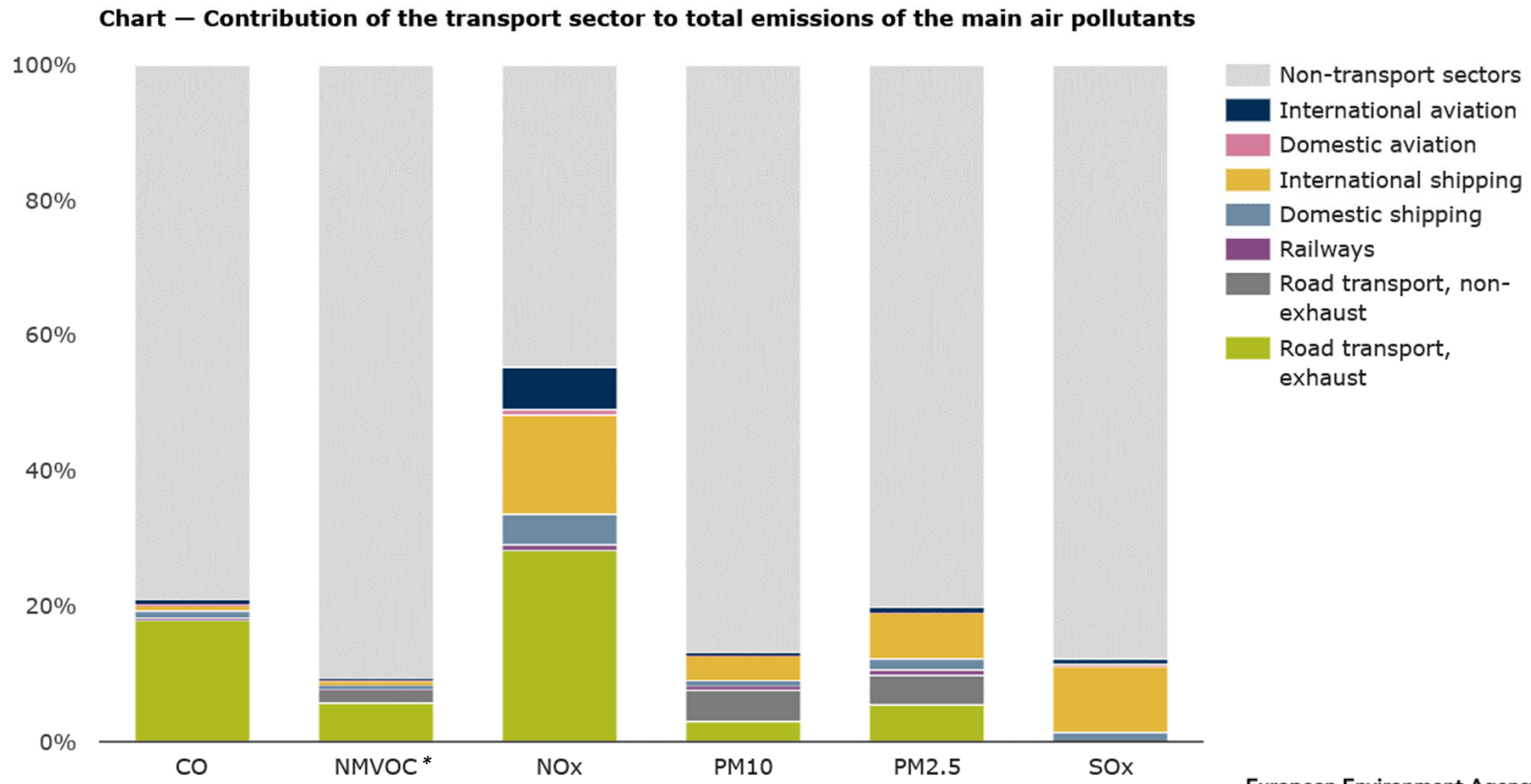
Emissions of concern :

NOx : Nitrogen oxides.
CO : Carbon monoxide.
HC : Hydrocarbons.
PM / PN : Fine particles.

1970 : First regulation (Directive 70/220)

1993: EURO 1 / 1997: EURO 2 / 2001: EURO 3 / 2006: EURO 4/ 2011: EURO 5 / 2016: EURO 6

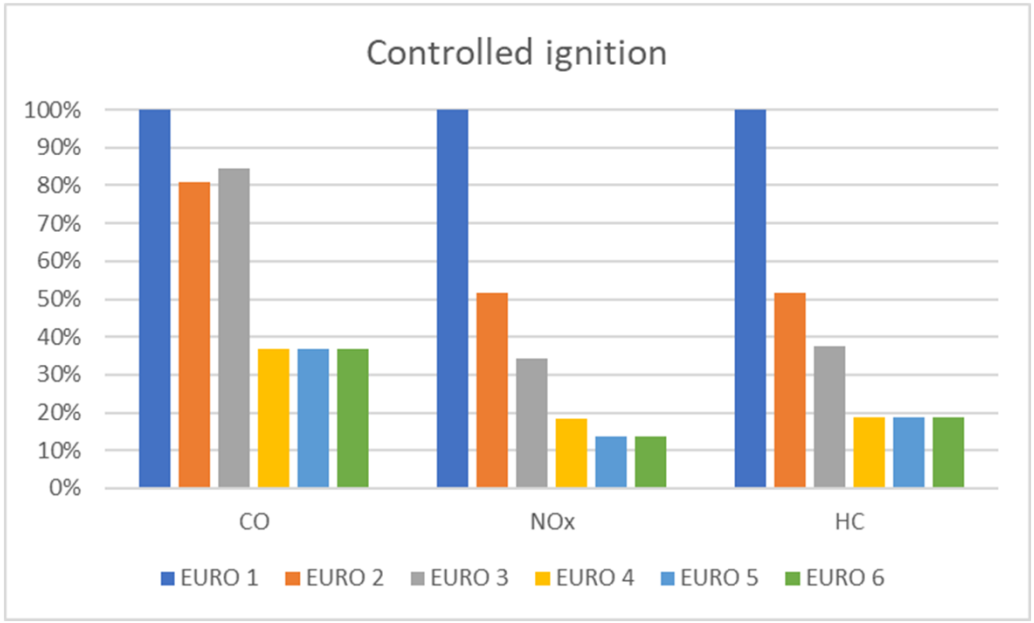
Public health : EURO 1, 2, … 6

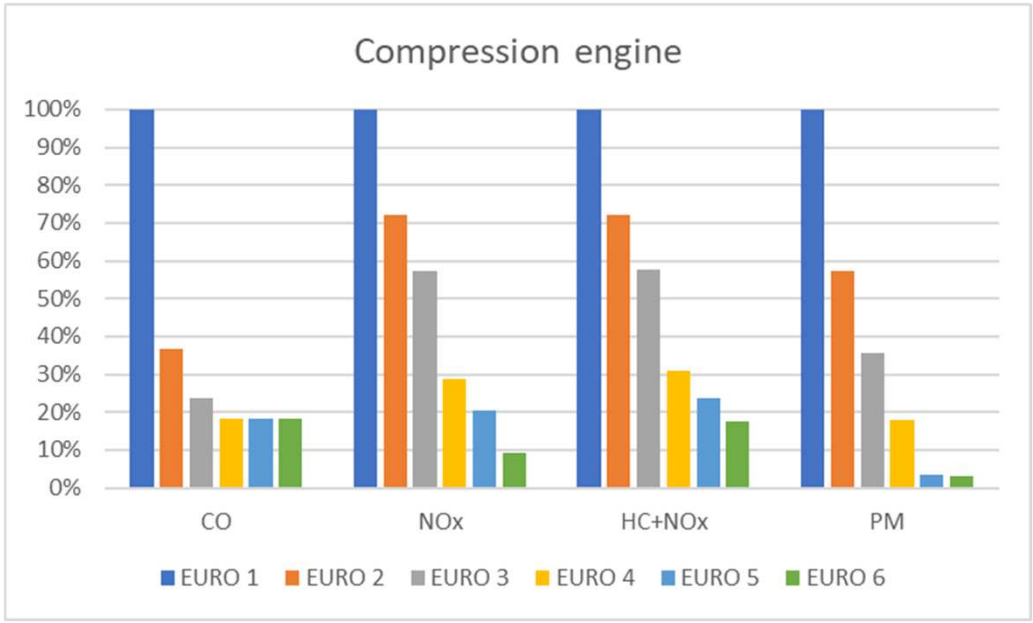


European Environment Agency
(dec. 2019)

** Non-methane volatile organic compounds*

Public health : EURO 1, 2, … 6





Most of the emissions have been reduced by 80% since 1992 (Euro 1)

Public health : EURO 1, 2, … 6

Euro 1, 2, …6

Do not include CO_2 or consumption performance

12,5 – 11,5 l/100 km
CO_2-emission : 283 – 259 g/km

5.8 L/100 km
CO_2 emission : 138 g/km

Classification des véhicules en application des articles L. 318-1 et R. 318-2 du code de la route

Classe	2 ROUES, TRICYCLES ET QUADRICYCLES À MOTEUR	VOITURES	VÉHICULES UTILITAIRES LÉGERS	POIDS LOURDS, AUTOBUS ET AUTOCAR
	Véhicules électriques et hydrogène			
	Véhicules gaz Véhicules hybrides rechargeables			

Classe	DATE DE PREMIÈRE IMMATRICULATION ou NORME EURO						
	2 ROUES, TRICYCLES ET QUADRICYCLES À MOTEUR	VOITURES		VÉHICULES UTILITAIRES LÉGERS		POIDS LOURDS, AUTOBUS ET AUTOCAR	
		Diesel	Essence	Diesel	Essence	Diesel	Essence
	**EURO 4** À partir du : 1er janvier 2017 pour les motocycles 1er janvier 2018 pour les cyclomoteurs	-	**EURO 5 et 6** À partir du 1er janvier 2011	-	**EURO 5 et 6** À partir du 1er janvier 2011	-	**EURO VI** À partir du 1er janvier 2014
	**EURO 3** du 1er janvier 2007 au : 31 décembre 2016 pour les motocycles 31 décembre 2017 pour les cyclomoteurs	**EURO 5 et 6** À partir du 1er janvier 2011	**EURO 4** du 1er janvier 2006 au 31 décembre 2010	**EURO 5 et 6** À partir du 1er janvier 2011	**EURO 4** du 1er janvier 2006 au 31 décembre 2010	**EURO VI** À partir du 1er janvier 2014	**EURO V** du 1er octobre 2009 au 31 décembre 2013
	**EURO 2** du 1er juillet 2004 au 31 décembre 2006	**EURO 4** du 1er janvier 2006 au 31 décembre 2010	**EURO 2 et 3** du 1er janvier 1997 au 31 décembre 2005	**EURO 4** du 1er janvier 2006 au 31 décembre 2010	**EURO 2 et 3** du 1er octobre 1997 au 31 décembre 2005	**EURO V** du 1er octobre 2009 au 31 décembre 2013	**EURO III et IV** du 1er octobre 2001 au 30 septembre 2009
	**Pas de norme tout type** du 1er juin 2000 au 30 juin 2004	**EURO 3** du 1er janvier 2001 au 31 décembre 2005	-	**EURO 3** du 1er janvier 2001 au 31 décembre 2005	-	**EURO IV** du 1er octobre 2006 au 30 septembre 2009	-
	-	**EURO 2** du 1er janvier 1997 au 31 décembre 2000	-	**EURO 2** du 1er octobre 1997 au 31 décembre 2000	-	**EURO III** du 1er octobre 2001 au 30 septembre 2006	-
Non classés	**Pas de norme tout type** Jusqu'au 31 mai 2000	**EURO 1 et avant** Jusqu'au 31 décembre 1996	**EURO 1 et avant** Jusqu'au 31 décembre 1996	**EURO 1 et avant** Jusqu'au 30 septembre 1997	**EURO 1 et avant** Jusqu'au 30 septembre 1997	**EURO I, II et avant** Jusqu'au 30 septembre 2001	**EURO I, II et avant** Jusqu'au 30 septembre 2001

Low Emission Zones

What are Low Emission Zones?

Low Emission Zones (LEZs) are areas where the most polluting vehicles are regulated.

LEZs are implemented in areas **where air pollution levels are dangerous to health**. LEZs improve the air quality and make it safer to breathe.

Usually this means that vehicles with higher emissions cannot enter the area. In some low emission zones the more polluting vehicles have to pay more if they enter the low emission zone.

Low Emission Zones are also known as:

Environment Zones,
Umweltzonen (Germany),
Milieuzones (Netherlands),
Zone à Circulation Restreinte ZCR, maintenant Zone à Faible Emissions ZFE (France)
Lage-emissiezone (Belgium)
Clean Air Zones (England)
Miljøzone (Denmark),
Miljözon (Sweden),
Lavutslippssone (Norway),
Alacsony Kibocsátási Övezet (Hungary),
ZTL ambiente (Italy).

EURO 7 : Nov. 2022 proposal by EC

Reduction of NOx emissions

- **35%** from cars and vans
- **56%** from buses and lorries

Reduction of particles from the tailpipe

- **13%** from cars and vans
- **39%**

On going negotiations between Parliament/ Commission / Council

Vehicles need to comply with emissions rules for longer period

Regulating additional pollutants

Battery durability requirements

Limits for emissions from brakes

Rules on microplastic pollution from tyres

GTR22

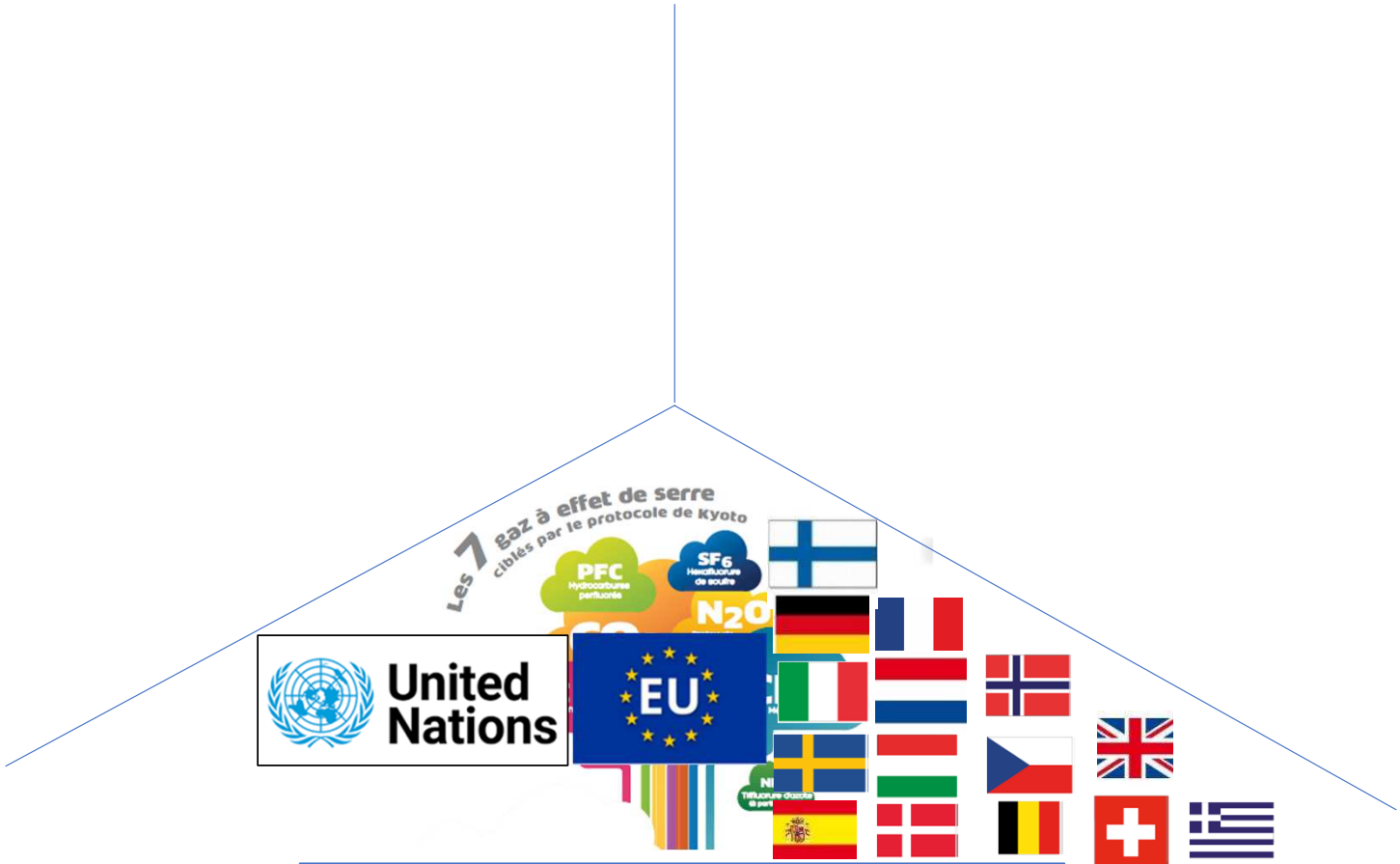
NEW

Application date :

1st July 2025 for PC and its components

1st July 2027 for TB and its components.

Key types of regulations



Mid & Long-term environmental issues

Mid & Long-term environmental issues

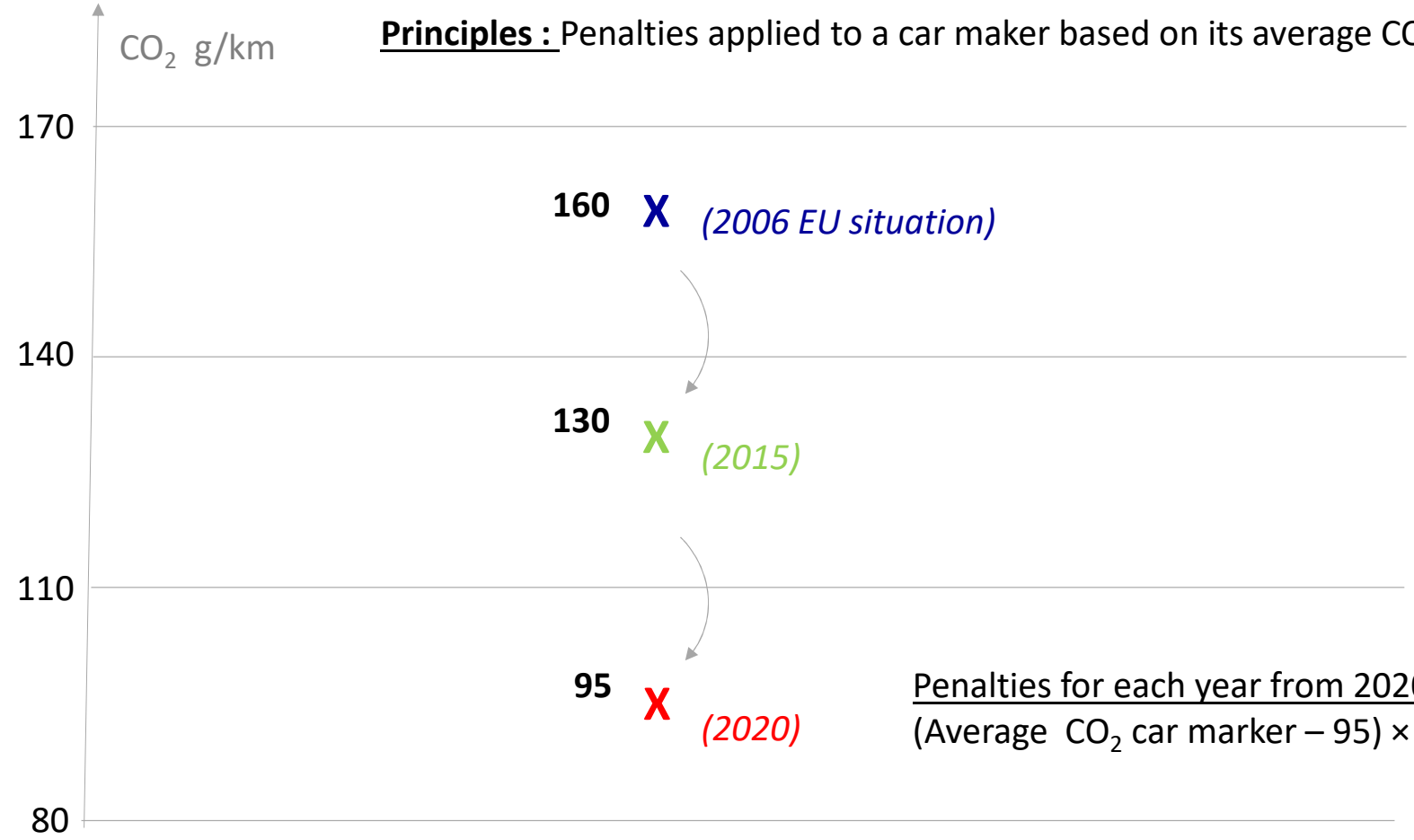
Measurement :

12/1980 : Directive on consumption information.
12/1993 : Directive includes CO_2 emission information.
2020 : from NEDC (New European Driving Cycle)
to WLTP (Worldwide harmonized Light vehicles Test Procedure)

Thresholds :

04/2009 : First regulation on CO_2 emission limits (requirement 2012).
04/2019 : Regulation on CO_2 emission limits until 2030.
11/2022 : Proposal to revise CO_2 emission limits until 2035

Corporate Average Fuel Economy (CAFE – CO2 emissions)

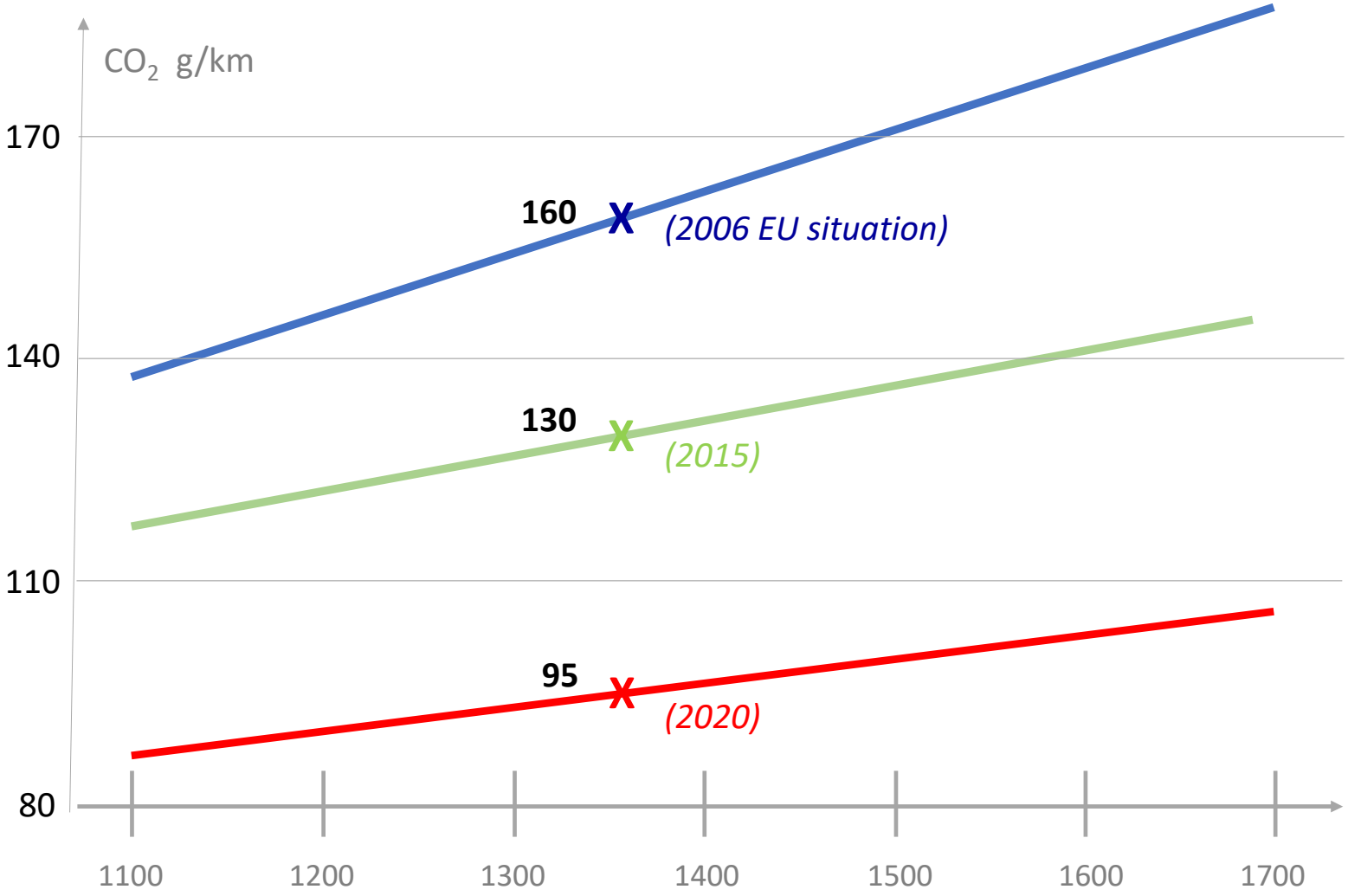


Principles : Penalties applied to a car maker based on its average CO_2 new vehicles registered in Europe.

Penalties for each year from 2020 to 2030:

(Average CO_2 car marker – 95) × 95€ × new vehicles registered.

Corporate Average Fuel Economy (CAFE – CO2 emissions)



Principles including vehicle mass :
Each car makers has a CO_2 specific objective based on its vehicle average weight registered.

From 2020, specific objective =
$95 + a \times (M - M_0)$

M = vehicle mass (kg)
M_0 = 1379,88 kg
a = 0,0333

Penalties per car maker :
(average CO_2 – specific objective) × 95€ × new vehicles registered.

Corporate Average Fuel Economy (CAFE – CO2 emissions)

Une mise en œuvre et des phases de transition en réalité plus complexes :

Des modes de calcul qui se sont sévérisés:

- Prise en compte de 65% (2012), 75% (2013), 80% (2014), 100% (2015) des voitures immatriculées par le constructeur.
- Calcul de la pénalité par constructeur :

Jusqu'en 2018 :

Lorsque les émissions spécifiques moyennes de CO_2 du constructeur dépassent son objectif d'émissions spécifiques de plus de 3 g de CO_2 /km:

[(émissions excédentaires — 3g de CO_2 /km) × 95€/g de CO_2 /km + 1g de CO_2 /km × 25€/g de CO_2 /km + 1g de CO_2 /km × 15€/g de CO_2 /km + 1g de CO_2 /km ×5€/g de CO_2 /km] × nombre de voitures particulières neuves;

….

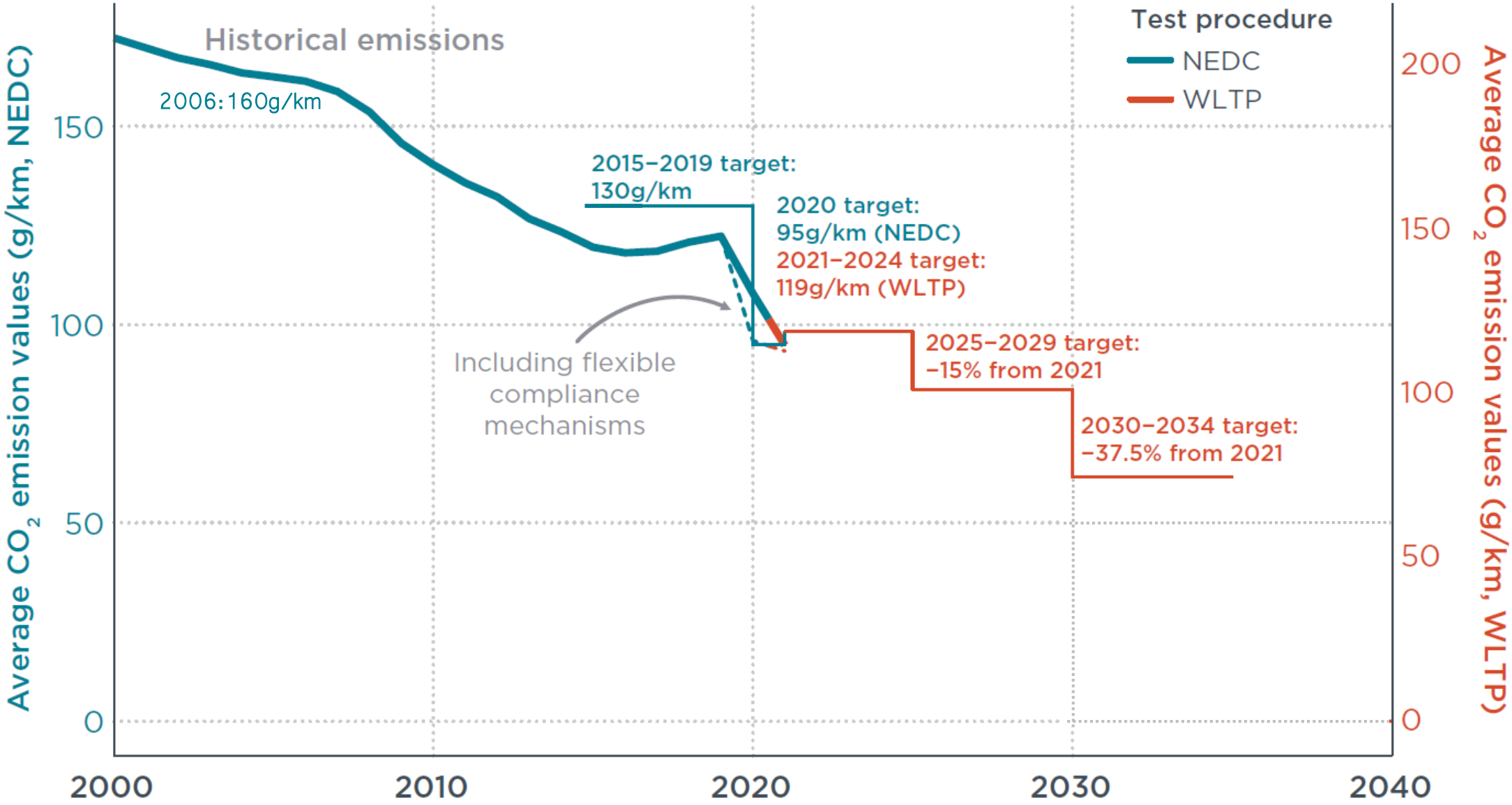
A partir de 2019 : (average CO_2 – specific objective) × 95€ × new vehicles registered.

Des bonus qui se réduisent :

Chaque voiture particulière neuve dont les émissions spécifiques de CO_2 sont inférieures à 50 g/km, compte pour:
3,5 voitures en 2012; 2,5 voitures en 2014; 1,5 voiture en 2015 …
Un « crédit » en fonction de l'atteinte d'un % minimum de véhicules à zéro ou faible émission (au-dessus de 15% en 2025, et de 35% en 2030).

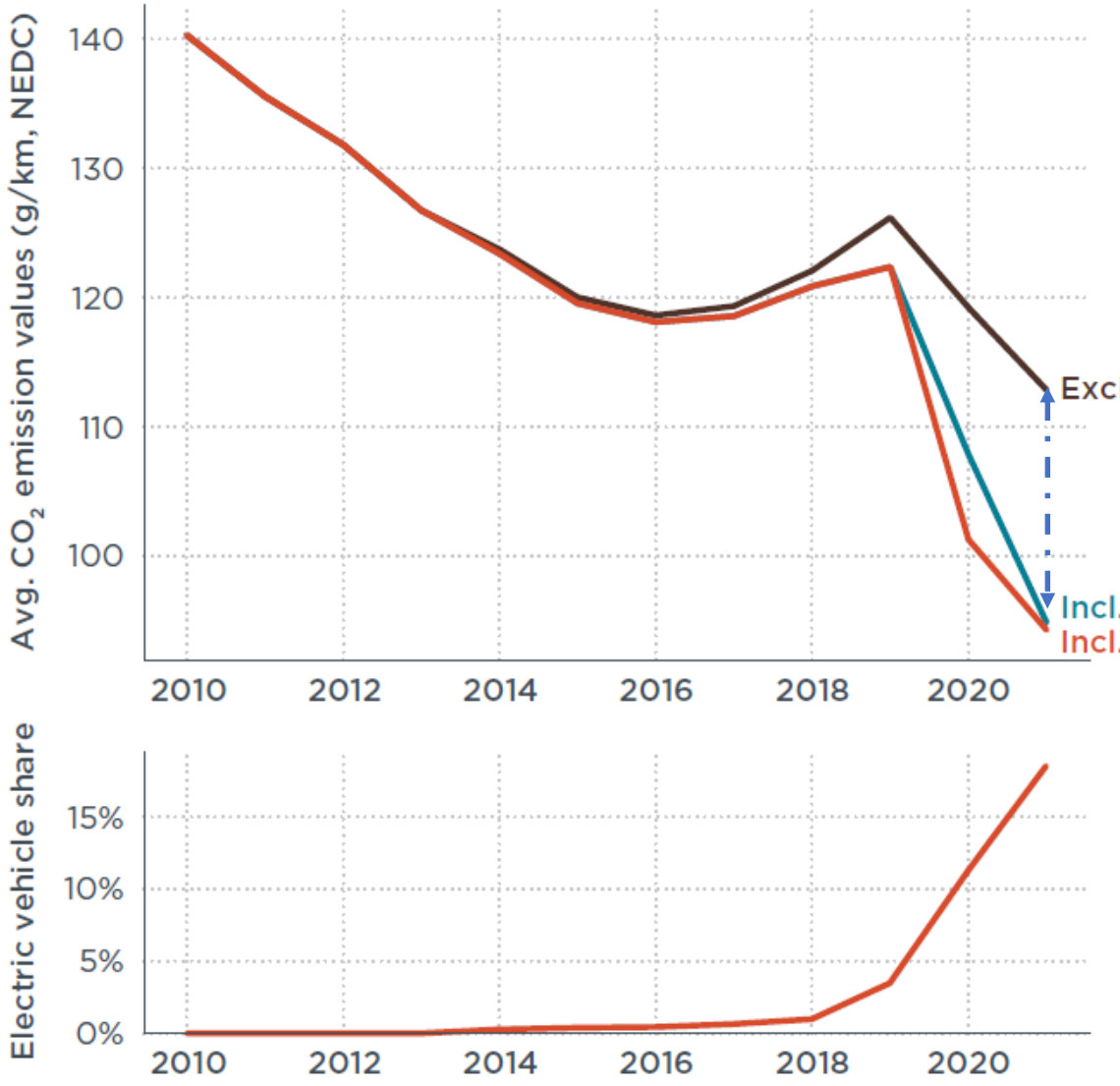
Des regroupements possibles :

Les constructeurs peuvent constituer des groupements en vue de respecter globalement leurs obligations (sur 5 ans).



NEDC = New European Driving Cycle *WLTP = Worldwide harmonized Light vehicles Test Procedure*

Corporate Average Fuel Economy (CAFE – CO_2 emissions)



Coût évité en 2021:
18g x 95€ x 10 millions véhicules = 17 milliards €

Nov 2022 : EC & Parliament proposal for new CO_2 limits

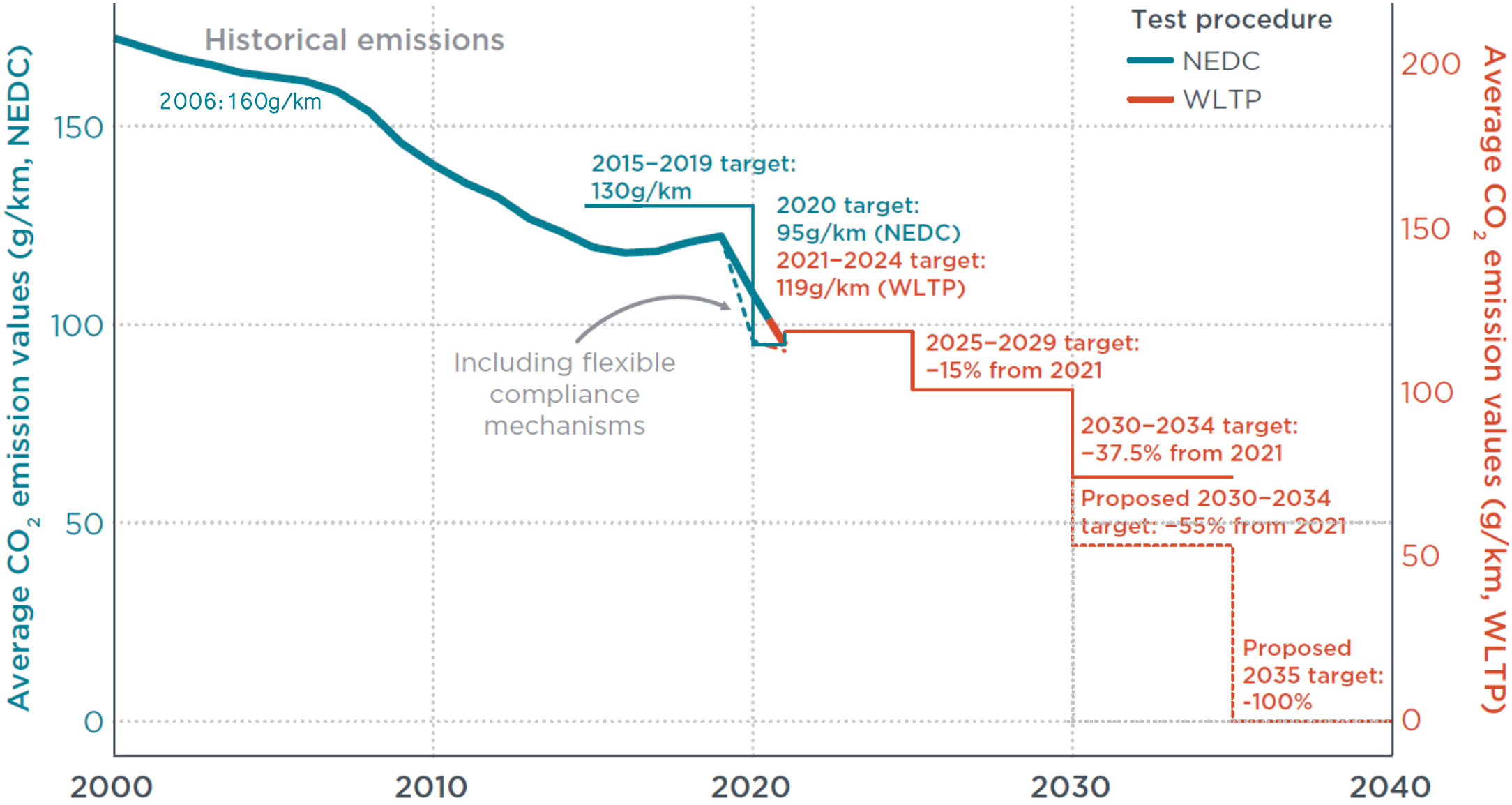
Revision of the limits (vs 2021) :

- 2025 : -15%
- 2030 : ~~-37.5%~~ → -55%
- 2035 : -100 %

By 2025, EC shall publish a report, setting a methodology for the assessment of the full **life-cycle CO_2** emission. From June 2026, manufacturers may submit (voluntary basis) le life-cycle CO_2 data.

By end 2025 : report on progress towards zero emission mobility
(including potential contribution of **synthetic fuels**)

By 2026 : The Commission shall assess progress made under this Regulation, taking into account the technological developments, including as regards **plug-in hybrid technologies**, and the importance of an economically viable and socially fair transition towards zero emission. Based on this assessment, the Commission shall assess **the need to review the targets of -100% by 2035**.



NEDC = New European Driving Cycle *WLTP = Worldwide harmonized Light vehicles Test Procedure*

Countries specific taxes & penalties vs CO_2 emissions

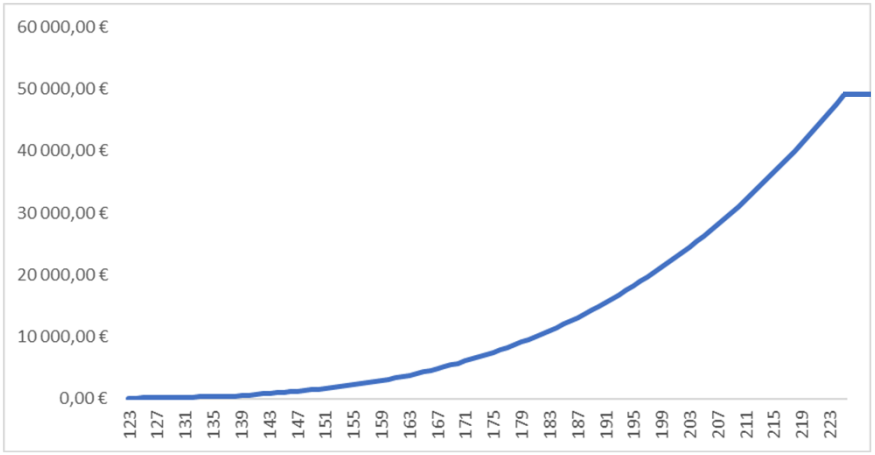
Each countries may have

- Additional taxes for the consumer
- Constraints
- Prohibition

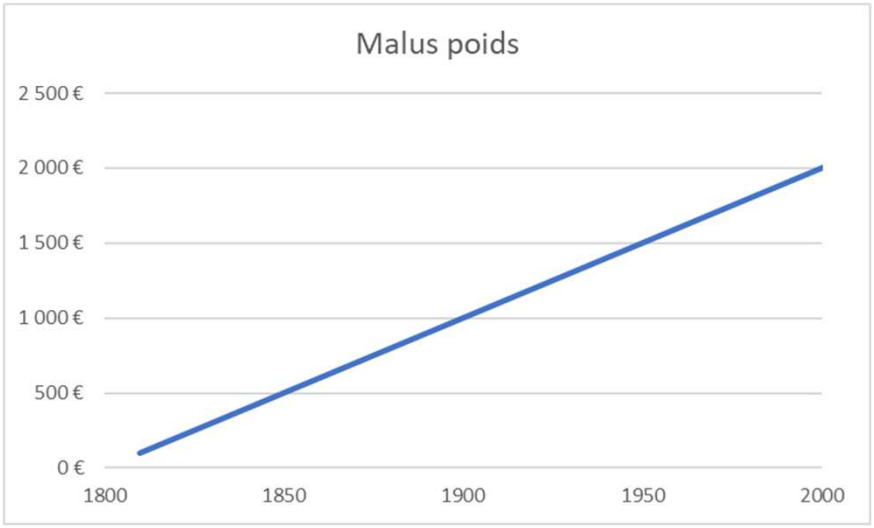
Countries specific taxes & penalties vs CO_2 emissions

France : Loi de finance pour 2023

Un malus à partir de 123 g/km d'émission de CO2 (norme WLTP).



Un malus sur le poids des véhicules : 1 800 kg il faudra compter 10 € par kilo au-dessus de 1 800 kg.



Countries specific decisions vehicles vs CO_2 emissions

New local legislation appeared : sometimes technology oriented, often with lack of clarity.

France : LOI 2019-1428 du 24 décembre 2019 d'orientation des mobilités (1)
Article 73

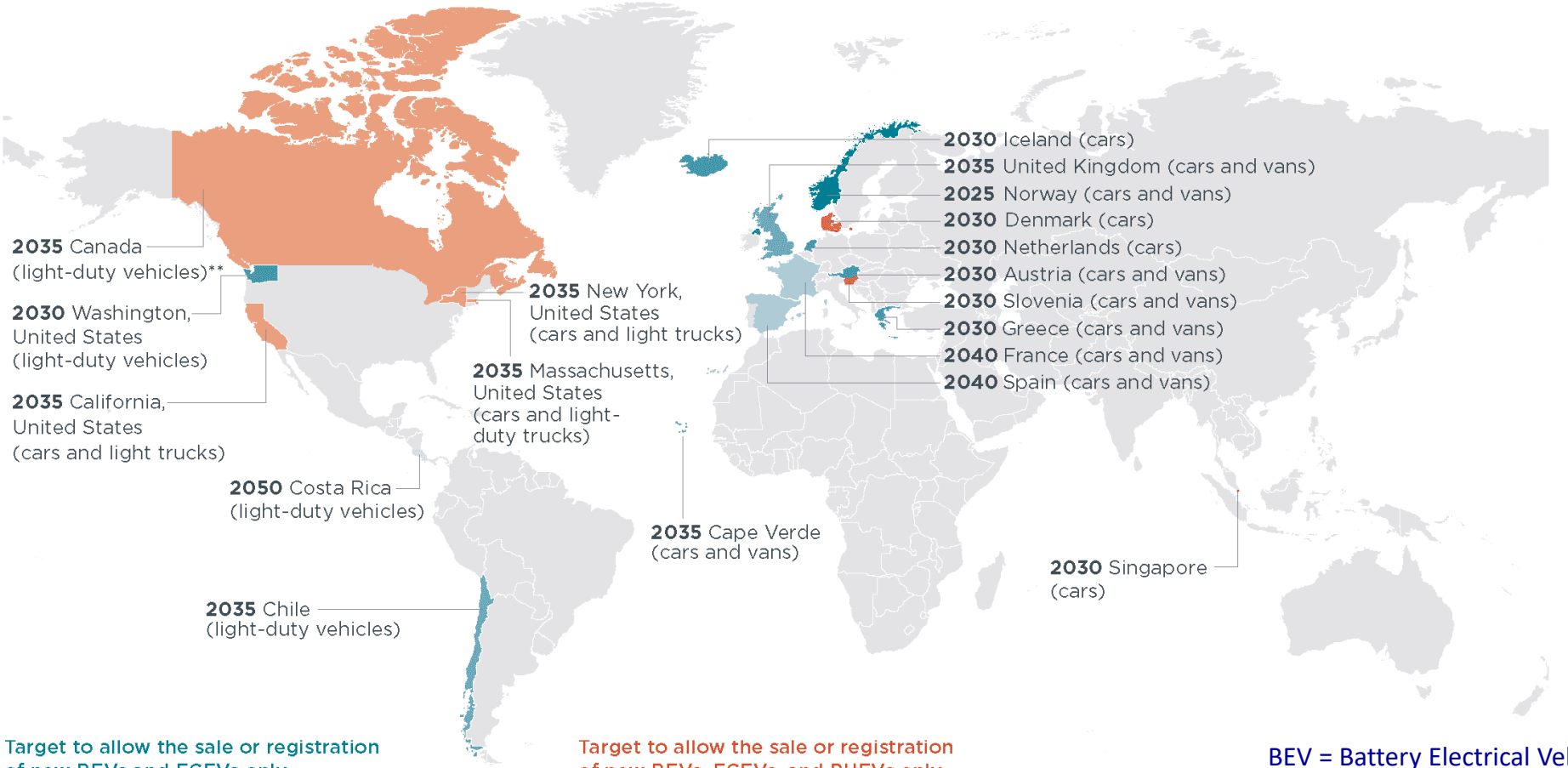
I. La France se fixe l'objectif d'atteindre, d'ici à 2050, la décarbonation complète du secteur des transports terrestres, entendue sur le cycle carbone de l'énergie utilisée.

II. Pour atteindre cet objectif, la France se fixe les objectifs intermédiaires suivants :
   - Une hausse progressive de la part des véhicules à faibles et très faibles émissions parmi les ventes de voitures particulières et de véhicules utilitaires légers neufs, permettant, en 2030, de remplir les objectifs fixés par le règlement (UE) 2019/631 du Parlement européen et du Conseil du 17 avril 2019 établissant des normes de performance en matière d'émissions de CO2 pour les voitures particulières neuves et pour les véhicules utilitaires légers neufs, et abrogeant les règlements (CE) no 443/2009 et (UE) no 510/2011 ;
   - **La fin de la vente des voitures particulières et des véhicules utilitaires légers neufs utilisant des énergies fossiles, d'ici à 2040.**

Government	ICE phase-out year	Vehicle segments	Policy document (publication date) and quoted target
EUROPE			
Norway	2025	Passenger cars, light commercial vehicles	National Transport Plan 2018-2029 (2017)[a] *All new passenger cars and light vans sold in 2025 shall be zero-emission vehicles.*
Netherlands	2030	Passenger cars	Mission Zero (2019)[b] *In the coalition agreement, the Dutch government committed to the target of all new passenger vehicles sold in 2030 being zero-emission, whether hydrogen-electric or battery electric.*
Denmark	2035	Passenger cars	Climate and Air Plan (2018)[c] *In the area of transport, we set a goal of stopping the sale of new petrol and diesel cars from 2030. At the same time, the government's goal is that from 2035, plug-in hybrid cars will no longer be sold.*
Iceland	2030	Passenger cars	Iceland's 2020 Climate Action Plan (2020)[d] *In principle, it will not be permitted to register gasoline and diesel cars in Iceland 2030. .... With this, a clear line is drawn in the sand that cars only powered by fossil fuels will not be part of the future passenger car transport in this country.*
Ireland	2030	Passenger cars	Climate Action Plan (2019)[e] *Introduce legislation to ban the sale of new fossil fuel cars from 2030.*
Slovenia	2030	Passenger cars, light commercial vehicles	Market Development Strategy for the Establishment of Adequate Alternative Fuel Infrastructure in the Transport Sector in the Republic of Slovenia (2017)[f] *After 2025, Slovenia will limit the first registration of passenger cars and light commercial vehicles ..., which according to the manufacturer's declaration have a higher share of CO_2 than 100 g/km, and after 2030 reduce this limit to 50 g/km.*
Sweden	2030	Passenger cars	Climate Policy Action Plan (2019)[g] *An inquiry is appointed so that from 2030 it will no longer be allowed to sell new gasoline and diesel cars.*
United Kingdom	2035	Passenger cars, light commercial vehicles	Consulting on ending the sale of new petrol, diesel and hybrid cars and vans (2020)[h] *Step 1 will see the phase-out date for the sale of new petrol and diesel cars and vans brought forward to 2030. Step 2 will see all new cars and vans be fully zero emission at the tailpipe from 2035. Between 2030 and 2035, new cars and vans can be sold if they have the capability to drive a significant distance with zero emissions (for example, plug-in hybrids or full hybrids), and this will be defined through consultation.*
France	2040	Passenger cars, light commercial vehicles	Mobility Guidance Law (2019)[i] *The end of the sale of new passenger cars and light commercial vehicles using fossil fuels by 2040.*

Government	ICE phase-out year	Vehicle segments	Policy document (publication date) and quoted target
EUROPE			
Spain	2040	Passenger cars, light commercial vehicles	Law on Climate Change and Energy Transition (2021)[l] *That new passenger cars and light commercial vehicles, excluding those registered as historical vehicles, not intended for commercial use, gradually reduce their emissions, so that no later than 2040 they become vehicles with emissions of 0 g CO_2/km.*
Germany, Baden-Wuerttemberg (Germany)	2050	Passenger cars	ZEVA commitment (2015)[k], not yet reflected in national Climate Protection Plan *We will strive to make all passenger vehicle sales in our jurisdictions ZEVs (zero-emission vehicles) as fast as possible, and no later than 2050.*
NORTH AMERICA			
California (United States)	2035	Passenger vehicles, light-duty vehicles	Executive Order (2020)[l] *Executive order directs state to require that, by 2035, all new cars and passenger trucks sold in California be zero-emission vehicles.*
Québec (Canada)	2035	Light duty vehicles	Act to increase the number of zero emission motor vehicles in Québec in order to reduce greenhouse gas emissions and other pollutants (2021)[m] *The government has set new targets for the electrification of light vehicles: ... that the sale of new gasoline-powered vehicles will be prohibited from 2035.*
British Columbia (Canada)	2040	Light duty vehicles	Zero-Emissions Vehicles Act (2021)[n] *In 2040 and each subsequent year, 100% of all new light-duty motor vehicles sold or leased on British Columbia must be zero-emission vehicles. ... Zero-emission vehicle or ZEV means the following: (a) a motor vehicle that (i) is propelled by electricity or hydrogen from an external source, and (ii) emits no greenhouse gases at least some of the time while the motor vehicle is being operated.*
Canada	2040	Light duty vehicles	Canada's actions to reduce emissions (2020)[o] *We are reducing this amount by: ... having established light-duty zero-emission vehicles policy sales targets of 10 percent by 2025, 30 percent by 2030, and 100 percent by 2040.*
Connecticut, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, Vermont, Washington (United States)	2050	Passenger cars	IZEVA commitment (2015)[p], not yet reflected in official state or provincial-level strategic documents *We will strive to make all passenger vehicle sales in our jurisdictions ZEVs (zero-emission vehicles) as fast as possible, and no later than 2050.*
SOUTH AMERICA			
Costa Rica	2050	Light vehicles	National Decarbonization Plan (2019)[q] *100% of sales of light vehicles will be zero emission vehicles by 2050 at the latest.*

Governments with official targets to 100% phase out sales or registrations of new internal combustion engine light-duty vehicles (passenger cars and vans/light trucks) by a certain date* (Status: Through September 2022)



Target to allow the sale or registration of new BEVs and FCEVs only

- 2025
- 2030
- 2035
- 2040
- 2050

Target to allow the sale or registration of new BEVs, FCEVs, and PHEVs only

- 2030
- 2035

BEV = Battery Electrical Vehicle
FCEV = Fuel Cell Electrical Vehicle
HEV = Hybrid Electrical Vehicle
PHEV = Plug-in Hybrid Electric Vehicle

https://theicct.org/phase-out-map-ldv/

* Includes countries, states, and provinces that have set targets to only allow the sale or registration of new battery electric vehicles (BEVs), fuel cell electric vehicles (FCEVs), and plug-in hybrid electric vehicles (PHEVs). Countries such as Japan with pledges that include hybrid electric vehicles (HEVs) and mild hybrid electric vehicles (MHEVs) are excluded as these vehicles are non plug-in hybrids.
** The Canadian province of British Columbia has set its 2040 target into binding regulation; the Canadian province of Québec has also set a target for 2035.

Conclusions

Regulation will not simplify.

Regulation will be more demanding (health, safety and environmental expectations).

Regulation will be completed to assure safety of technical innovations use (autonomous vehicles, cyber security, …).

For Greenhouse Gas issues : the vehicle full life-cycle CO_2 indicator is the most relevant integrated indicator and will be including in the regulations when available.

Regulators try to be technical neutral, but as long as the life-cycle CO_2 indicator does not exist, decision are always challengeable.

Thank you for your attention