Vous avez dit réglementation véhicules ?
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.

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

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Head lamps</td>
<td>Belt anchorage</td>
<td>Child restraint syst.</td>
<td>Daytime lamps</td>
<td>Comp. Natural gas</td>
<td>Led lights</td>
</tr>
<tr>
<td>Braking</td>
<td>Seat</td>
<td>Headlamp cleaner</td>
<td>Speed limitation devices</td>
<td>Replacement Airbag</td>
<td>Child restraint syst.</td>
</tr>
<tr>
<td>Retro-reflecting</td>
<td>Interior fittings</td>
<td>Rear-view mirrors</td>
<td>Side marker lamps</td>
<td>Tyre noise, wet grip...</td>
<td>Lane departure warning</td>
</tr>
<tr>
<td>Direction indicator</td>
<td>Reversing lamp</td>
<td>Sound Level</td>
<td>Front underrun devices</td>
<td>Fire resistance inter.</td>
<td>Emergency braking</td>
</tr>
<tr>
<td>Position, stop lamps</td>
<td>Headrest</td>
<td>Silencing system</td>
<td>Occupant protect.</td>
<td>Forward field vision</td>
<td>Hydrogen safety</td>
</tr>
<tr>
<td></td>
<td>Extern. projection</td>
<td>Temp. spare tyre</td>
<td>in a lateral collision</td>
<td>Hand controls</td>
<td>Bake assistance</td>
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<tr>
<td></td>
<td>Warning triangle</td>
<td>LPG equipment</td>
<td>In a front collision</td>
<td>Adaptive Front light</td>
<td>Electronic stability</td>
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<tr>
<td></td>
<td>Audible Warnings</td>
<td>Parking lamps</td>
<td>Gas-discharge lights</td>
<td>Passengers protect</td>
<td>TPMS</td>
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<tr>
<td></td>
<td>Tyres</td>
<td>Steering equipt</td>
<td>Battery electric</td>
<td>against luggage</td>
<td>Emergency call</td>
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<tr>
<td></td>
<td>Fire risks</td>
<td>Seats &amp; anchorage</td>
<td>vehicle safety</td>
<td></td>
<td>Fuel syst. integrity</td>
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<tr>
<td></td>
<td>Filament lamps</td>
<td>Safety glazing</td>
<td>Retreaded tyres</td>
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<td>Cybersecurity</td>
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<td></td>
<td>Speedometer</td>
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<td>Automated lane keeping</td>
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<td>Event data record</td>
</tr>
</tbody>
</table>
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
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)

Public health: EURO 1, 2, ... 6

Chart — Contribution of the transport sector to total emissions of the main air pollutants

* Non-methane volatile organic compounds
Most of the emissions have been reduced by 80% since 1992 (Euro 1)
Public health: EURO 1, 2, ... 6

12.5 – 11.5 l/100 km
CO₂-emission: 283 – 259 g/km

5.8 L/100 km
CO₂ emission: 138 g/km

Do not include CO₂ or consumption performance
<table>
<thead>
<tr>
<th>Classe</th>
<th>2 ROUES, TRICYCLES ET QUADRİCİCLES À MOTEUR</th>
<th>VOITURES</th>
<th>VÉHİCULES UTILITAIRES LÉGERS</th>
<th>POIDS LOURDS, AUTOBUS ET AUTOCAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Véhicules électriques et hydrogène</td>
<td></td>
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<td>Véhicules gaz</td>
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<td>Véhicules hybrides rechargeables</td>
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<table>
<thead>
<tr>
<th>DATE DE PREMIÈRE IMMATRICULATION ou NORME EURO</th>
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<tbody>
<tr>
<td>2 ROUES, TRICYCLES ET QUADRİCİCLES À MOTEUR</td>
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<tr>
<td>VOITURES</td>
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<td>Diesel</td>
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<tr>
<td>EURO 4</td>
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<tr>
<td>EURO 3</td>
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<tr>
<td>EURO 2</td>
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<tr>
<td>Pas de norme tout type</td>
</tr>
<tr>
<td>Non classé</td>
</tr>
</tbody>
</table>
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

On going negotiations between Parliament/ Commission / Council

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:

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.

- 160 X *(2006 EU situation)*
- 130 X *(2015)*
- 95 X *(2020)*
Corporate Average Fuel Economy (CAFE – CO2 emissions)

**Principles including vehicle mass:**
Each car maker has a CO2 specific objective based on its vehicle average weight registered.

From 2020, specific objective = 95 + a × (M – M₀)

M = vehicle mass (kg)
M₀ = 1379.88 kg
a = 0.0333

**Penalties per car maker:**
(average CO₂ – 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 sévérissés:
- 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 CO₂ du constructeur dépassent son objectif d'émissions spécifiques de plus de 3 g de CO₂/km:
    \[
    \left(\text{émissions excédentaires } - \ 3 \text{g de CO}_2/\text{km}\right) \times 95\text{€/g de CO}_2/\text{km} + 1\text{g de CO}_2/\text{km} \times 25\text{€/g de CO}_2/\text{km} + 1\text{g de CO}_2/\text{km} \times 15\text{€/g de CO}_2/\text{km} + 1\text{g de CO}_2/\text{km} \times 5\text{€/g de CO}_2/\text{km}\right) \times \text{nombre de voitures particulières neuves};
    \]
    A partir de 2019 : (average CO₂ – specific objective) × 95€ × new vehicles registered.

Des bonus qui se réduisent :
Chaque voiture particulière neuve dont les émissions spécifiques de CO₂ 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).

Historical emissions

2006: 160g/km

2015–2019 target: 130g/km

2020 target: 95g/km (NEDC)
2021–2024 target: 119g/km (WLTP)

2025–2029 target: -15% from 2021
2030–2034 target: -37.5% from 2021

Test procedure

- NEDC
- WLTP

NEDC = New European Driving Cycle
WLTP = Worldwide harmonized Light vehicles Test Procedure
Corporate Average Fuel Economy (CAFE – CO₂ emissions)

Coût évité en 2021:
18g x 95€ x 10 millions véhicules = 17 milliards €
Nov 2022 : EC & Parliament proposal for new CO\textsubscript{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\textsubscript{2} emission. From June 2026, manufacturers may submit (voluntary basis) life-cycle CO\textsubscript{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.
2006: 160g/km

2005–2019 target: 130g/km

2020 target: 95g/km (NEDC)
2021–2024 target: 119g/km (WLTP)

2025–2029 target: -15% from 2021

2030–2034 target: -37.5% from 2021

Proposed 2030–2034 target: -55% from 2021

Proposed 2035 target: -100%
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\textsubscript{2} emissions

**France**: Loi de finance pour 2023

Un malus à partir de 123 g/km d’émission de CO\textsubscript{2} (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\textsubscript{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.
<table>
<thead>
<tr>
<th>Government</th>
<th>ICE phase-out year</th>
<th>Vehicle segments</th>
<th>Policy document (publication date) and quoted target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>2025</td>
<td>Passenger cars, light commercial vehicles</td>
<td>National Transport Plan 2018-2029 (2017)(^{a})                                                                                     <em>All new passenger cars and light commercial vehicles sold in 2025 shall be zero-emission vehicles.</em></td>
</tr>
<tr>
<td>Netherlands</td>
<td>2030</td>
<td>Passenger cars</td>
<td>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.</td>
</tr>
<tr>
<td>Denmark</td>
<td>2035</td>
<td>Passenger cars</td>
<td>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.</td>
</tr>
<tr>
<td>Iceland</td>
<td>2030</td>
<td>Passenger cars</td>
<td>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.</td>
</tr>
<tr>
<td>Ireland</td>
<td>2030</td>
<td>Passenger cars</td>
<td>Climate Action Plan (2019)(^{e})                                                                                                 Introduce legislation to ban the sale of new fossil fuel cars from 2030.</td>
</tr>
<tr>
<td>Slovenia</td>
<td>2030</td>
<td>Passenger cars, light commercial vehicles</td>
<td>Market Development Strategy for the Establishment of Adequate Alternative Fuel Infrastructure in the Transport Sector in the Republic of Slovenia (2017)(^{f})                                                  <em>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.</em></td>
</tr>
<tr>
<td>Sweden</td>
<td>2030</td>
<td>Passenger cars</td>
<td>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.</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2035</td>
<td>Passenger cars, light commercial vehicles</td>
<td>Consulting on ending the sale of new petrol, diesel and hybrid cars and vans (2020)(^{h})                                                                                              <em>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.</em></td>
</tr>
<tr>
<td>France</td>
<td>2040</td>
<td>Passenger cars, light commercial vehicles</td>
<td>Mobility Guidance Law (2019)(^{i})                                                                                               <em>The end of the sale of new passenger cars and light commercial vehicles using fossil fuels by 2040.</em></td>
</tr>
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<td><strong>EUROPE</strong></td>
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<tr>
<td>Spain</td>
<td>2040</td>
<td>Passenger cars, light commercial vehicles</td>
<td>Law on Climate Change and Energy Transition (2021)(^1) 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.</td>
</tr>
<tr>
<td>Germany, Baden-Württemberg (Germany)</td>
<td>2050</td>
<td>Passenger cars</td>
<td>ZEVA commitment (2015)(^5), 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.</td>
</tr>
<tr>
<td><strong>NORTH AMERICA</strong></td>
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<tr>
<td>California (United States)</td>
<td>2035</td>
<td>Passenger vehicles, light-duty vehicles</td>
<td>Executive Order (2020)(^6) Executive order directs state to require that, by 2035, all new cars and passenger trucks sold in California be zero-emission vehicles.</td>
</tr>
<tr>
<td>Québec (Canada)</td>
<td>2035</td>
<td>Light duty vehicles</td>
<td>Act to increase the number of zero emission motor vehicles in Québec in order to reduce greenhouse gas emissions and other pollutants (2021)(^7) 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.</td>
</tr>
<tr>
<td>British Columbia (Canada)</td>
<td>2040</td>
<td>Light duty vehicles</td>
<td>Zero-Emissions Vehicles Act (2021)(^8) 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.</td>
</tr>
<tr>
<td>Canada</td>
<td>2040</td>
<td>Light duty vehicles</td>
<td>Canada's actions to reduce emissions (2020)(^9) 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.</td>
</tr>
<tr>
<td>Connecticut, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, Vermont, Washington (United States)</td>
<td>2050</td>
<td>Passenger cars</td>
<td>IZEVA commitment (2015)(^5), 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.</td>
</tr>
<tr>
<td><strong>SOUTH AMERICA</strong></td>
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<tr>
<td>Costa Rica</td>
<td>2050</td>
<td>Light vehicles</td>
<td>National Decarbonization Plan (2019)(^5) 100% of sales of light vehicles will be zero emission vehicles by 2050 at the latest.</td>
</tr>
</tbody>
</table>
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)

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

- 2030 Iceland (cars)
- 2035 United Kingdom (cars and vans)
- 2025 Norway (cars and vans)
- 2030 Denmark (cars)
- 2030 Netherlands (cars)
- 2030 Austria (cars and vans)
- 2030 Slovenia (cars and vans)
- 2030 Greece (cars and vans)
- 2040 France (cars and vans)
- 2040 Spain (cars and vans)
- 2030 Singapore (cars)

**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

* 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.

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