“Global reduction in CO2 emissions from cars: a consumer’s perspective”

Policy recommendations for decision makers

Context: the global agenda

The international political response to climate change was initiated in Rio de Janeiro, Brazil, at the Earth Summit in 1992. The adopted convention set out a framework for action aimed at stabilising atmospheric concentrations of greenhouse gases (GHGs).

Since then, CO_2 emission reduction policies have driven the international policy agenda, with a particular emphasis in the transport sector: oil dependency and climate change are highly debated by governments and international decision-makers (UN Framework on Climate Change, UN-UNECE, European Commission); the automotive industry is requested to improve the environmental performance of its products; local authorities, particularly at urban level, are confronted with the issue of limiting the environmental impact of the growing demand for road transportation.

COP21, also known as the 2015 Paris Climate Conference, will, for the first time in over 20 years of UN negotiations, aim to achieve a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C.

At the local level, major cities have undertaken ambitious plans to reduce their own carbon footprint, and climate negotiations have until now, focused on setting ‘top-down’ targets to drive national action. Now, the emphasis has shifted, and individual countries are being asked to come forward with their own ambitions and plans for carbon reduction.

Technology, innovation, new economic trends and political commitment are all coming together to shape a low-carbon future in a timely manner.

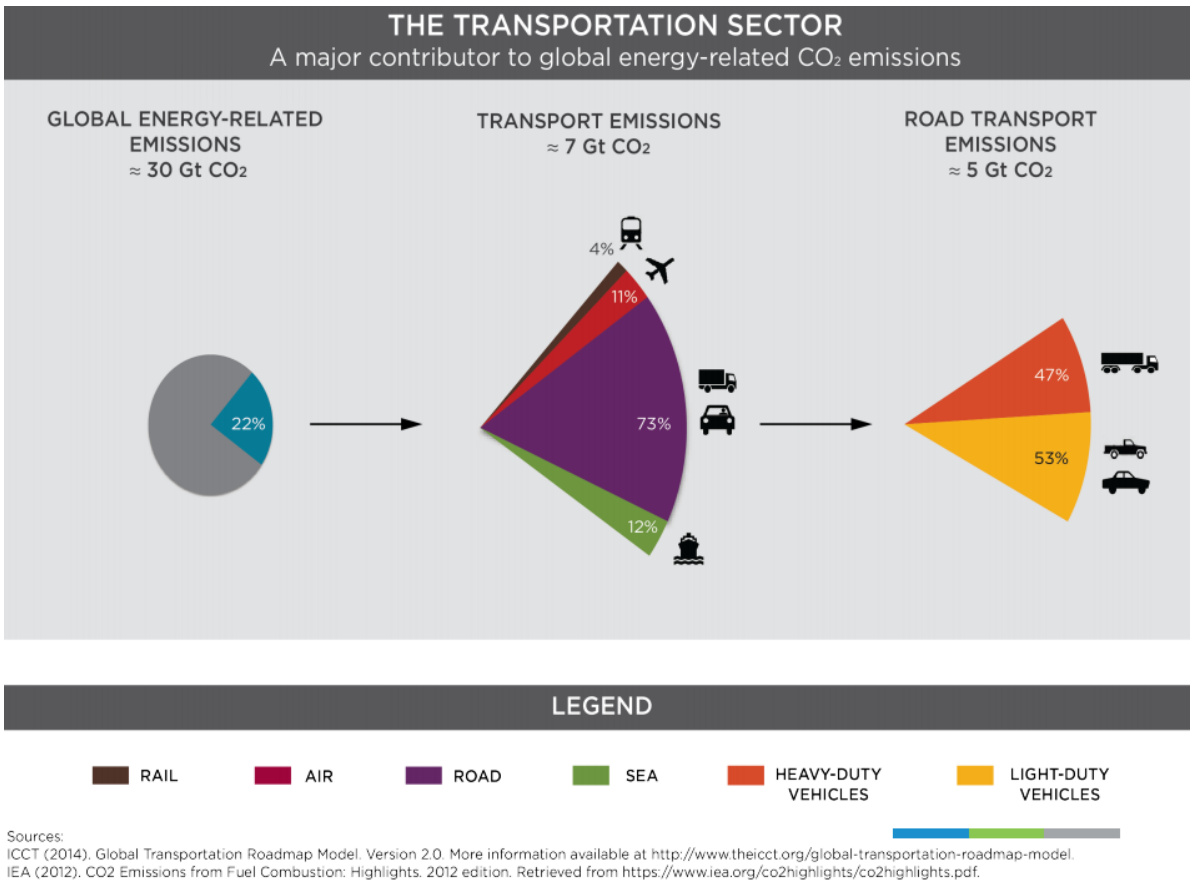
Transport and climate change

Transport plays an important role in peoples’ lives, providing access to jobs, services, education and leisure while creating the conditions to support economic growth. This is why transport is instrumental in achieving some of the sustainable development goals (SDGs), such as improving urban and rural access, improving safety and reducing air pollution.

Although transport is not the main contributor to GHG emissions, accounting only for about 22% of total energy-related CO_2 emissions, it plays an important role because of the sharp increase in traffic and its near total dependence on fossil fuels. The transport sector, in fact, is the fastest growing sector among all emissions sources. In particular, land transport is a major carbon emitter: according

to recent ITF data, CO_2 emissions from global surface passenger transport will grow by between 30% and 110% by 2050 (ITF Transport Outlook 2015), depending on fuel prices and urban transport development.

Considering these dynamics, the role of the transport sector in achieving climate change and sustainable development action is fundamental.



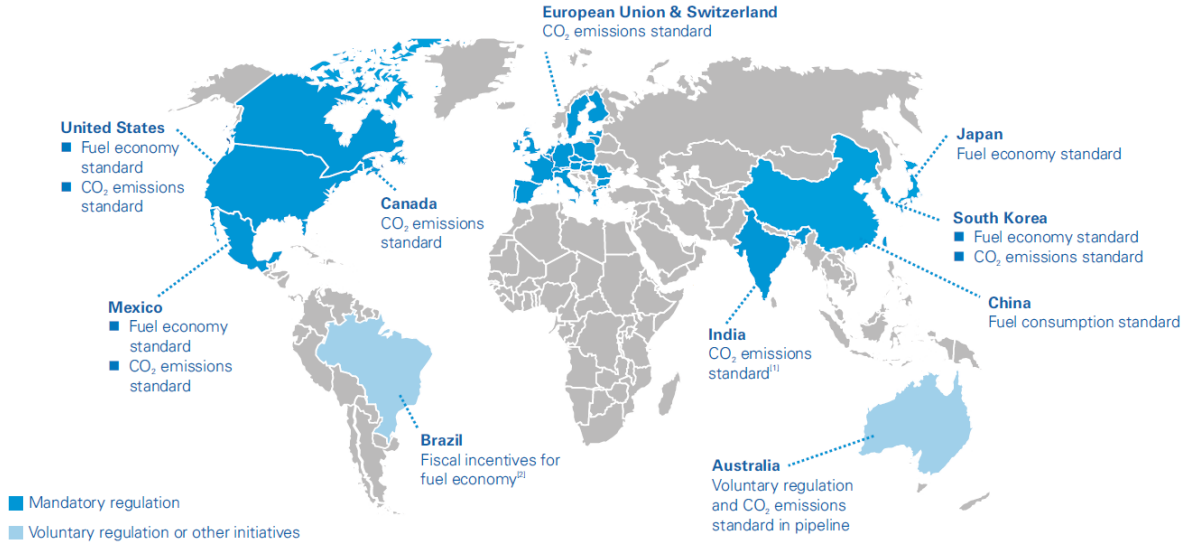
Unless major changes are made, transportation demand and its resulting oil use and GHG emissions seem destined to continue their explosive growth of the past few decades, concentrated largely in the developing world.

Looking at the regulatory framework, despite the growing importance of CO_2 regulation within the transport sector, a uniform global approach to tackling the issue has not yet been developed.

Emission regulations: major automotive markets[1]

REGULATORY OPTION	COUNTRY
Fuel economy (km/L)	USA, Japan, South Korea
Fuel consumption (L/100km)	China, Australia
CO_2 emissions (CO_2/km)	EU, South Korea
GHG (CO_2e/mile) Can include other non-CO_2 emissions (e.g. $_2$O, black carbon)	USA, Canada

[1] Sources: Arthur D.Little, UNEP, Global Fuel Economy Initiative 2014 Report.



Source: Arthur D. Little analysis

[1] India's CO_2 Emission Standard has been defined in 2013 and will be apply from 2016
[2] Brazil's fiscal incentives are provided for OEMs

The need for a consistent approach

Structural progress in CO_2 emissions reduction can only be achieved at global park level (car, truck, train, boat, plane, etc.), by addressing a wide range of interventions, such as: pricing mechanisms; regulatory interventions; ancillary measures, including but not limited to the implementation of environmental management systems, traffic management, land use planning, promotion of collective transport modes, as well as non-fiscal measures aiming at increasing awareness of consumers (labelling, improving vehicle maintenance; ecodriving programs, etc.).

Key recommendations

1. Encourage governments to set long-term vision and to adopt a consistent approach to CO_2 abatement
2. Design the right structural policies
3. Consider the implementation of complementary policies

Driving CO_2 emissions reduction: key recommendations

1. **Encourage governments to set long-term vision and to adopt a consistent approach to CO_2 abatement.**

International frameworks such as the G20 and COP21 can offer considerable support for national efforts in making transport more sustainable for the environment and for health. By endorsing these agreements, countries demonstrate their willingness to promote a certain number of measures at a local level to reach long-term objectives.

Countries need long-term commitment to create a stable framework where the industry can promote innovation, resulting in clear benefits to consumers with reduced purchasing prices on markets.

In this framework, governments should implement policies that are environmentally effective, economically efficient (with minimal cost of implementation) and politically feasible, while maintaining a strong component of equity. Programmes and incentives should be structured so as to achieve GHG reductions through investments, while continuing to meet mobility and accessibility objectives for passenger travel.

In order to reduce GHG emissions at a global scale in the transport sector, a three-tiered action is required:

- **Promotion of consistent policies**: if policy makers want to effectively decarbonise economies, economy-wide instruments are necessary. **CO_2 abatement from transport should not be valued more highly than equivalent abatement from electricity generation, agriculture, or industry**. Government interventions are needed to pull technology that exists today into the marketplace, support technological development for the future, and correct dependence on fossil fuels. Policy instruments should address fuel producers (responsible for the carbon intensity of fuels), car manufacturers (accountable for the energy efficiency of the vehicles), as well as consumers (they determine the travel demand). Considering many policies are going to impact stakeholders – whether road users or taxpayers – careful calibration is needed to ensure that the benefits they deliver stack up against the costs, not just in financial terms but also regarding a potential loss of mobility.

- **Innovation and technology deployment**: substantial improvements are already possible today by scaling up utilisation of existing vehicle technology.

- **Ensuring public support**: when consumers are put in a position to embrace low carbon technology, public policy, technological progress, and market success will subsequently be mutually reinforcing. This is the case when policies are consistent and deliver the results promised in a transparent way. It is vital to facilitate the public's understanding of the suggested regulations by explaining the objectives and the benefits in play. Transparency and continuous reviews are vital to ensure concrete improvements can be seen.

Example of unintended consequences: the European experience with diesel vehicles.

In Europe, diesel cars have been promoted as a low carbon and cheap-to-run alternative to petrol cars and, in many countries, make up half of the new car market. Over the last 15-20 years, consumers have embraced this technology in the belief diesel cars were more environmentally friendly, and under the promise of cost savings at the pump. Now, after several years and the evidence that diesel cars emit tiny dust particles (PM 2.5 and PM10) and nitrogen dioxide (NO_2), which are a health hazard, many cities have started to consider banning diesel vehicles from city centres to meet air quality legislation. This is a clear example of policies designed to support behavioural change in the market that can in turn lead to unintended consequences.

2. Design the right structural policies

Policy makers have a number of policy instruments to be implemented and/or combined to reduce GHG emissions. These include:

a) Fuel taxes
b) Market-based measures
c) Fuel economy standard
d) Fiscal incentives, including feebates

In principle, policy for efficient and low CO_2 transport need to be ambitious and at the same time technically achievable and affordable for consumers.

Fuel taxes and fiscal policies

Fuel taxes consist in a traditional instrument that enables the internalisation of transport externalities, including CO_2 emissions. Fuel taxes, which are decided on a national level, are a key source of fiscal revenue for many countries and pose social implications: those people who need a personal car (commuters, rural inhabitants) would be hit harder by higher tax rates than other demographic groups.

Countries have developed widely different fiscal policies aimed at promoting fuel efficient cars: the FIA believes that governments should ensure that broader taxation on motoring is consistent with climate change objectives.: Wherever possible, emission standards and the taxation systems based upon them should guide the setting of performance standards, in accordance with the technology neutral principle, that are the same for petrol, diesel or other fuels or propulsion systems.

→Governments should design fuel taxation policies which ensure that there is transparency for consumers, maximise the potential for behavioural change and create a mechanism that makes sure that revenue is invested in emission-reducing improvements to the transport network. In particular, the component of fuel taxation with CO_2 abatement objectives should be earmarked in that perspective.

→Fiscal policy should be technology-neutral and result-oriented and should be designed in a way that leads to affordable vehicles to the consumer at large.

Market-based measures

Market-based measures should include road transport in the emission trading system or introduce carbon taxation mechanisms.

Introducing carbon pricing risks increasing the price of goods and services that release heavy emissions, and which have a negative effect on demand. On the other hand, carbon pricing also creates an incentive to invest, which is beneficial for the economy and, in the long run, can drive behaviour changes of all market players, including consumers.

Areas that are looking at these solutions are New Zealand (18% of GHG from transport) and California (37% of GHG from transport). The New Zealand ETS covers liquid fossil fuel (petrol, diesel, natural gas and kerosene for aviation, together with domestic fuels). The Californian ETS, launched in 2012, now includes the transport sector. In addition to industrial sites, energy sites and sites generating and importing electricity, all suppliers of CO_2, including fuel distributors, will have an obligation of compliance. Basically, in both countries, the point of regulation is at the fuel suppliers' level. Discussions on the inclusion of road transport CO_2 emissions also started recently in the Province of Shenzhen (37.9% of GHG from transport), China, where the municipal authorities announced their willingness to include the CO_2 emissions of buses and taxis in its pilot ETS.

→Countries looking at this approach should make sure that the new regulations will not increase the level of taxation for consumers. Demand for fuel among motorists is relatively inelastic, so any increase in fuel prices leads only to a small decrease in consumption. The new value created by these carbon price mechanisms, can be used to reduce the tax burden and/or earmarked to sustainable mobility strategies.

Fuel economy standard and regulation

Fuel efficiency standards are mandated in many important automobile markets (EU, Japan, China, and USA)[2] to foster climate change mitigation and reduce oil dependency. These standards address car manufacturers, and incentivise them to improve the efficiency of their products.

One basis for adopting fuel economy standards refers to the fact that consumers do not always incorporate fuel savings in their purchase decisions. Fuel economy regulations can have a better impact in countries where there is a wide presence of commercial and public fleets.

Although there is strong evidence that, on average, regulations can achieve improved fuel consumption and emission reductions while potentially delivering net cost savings to consumers

[2] Fuel efficiency standards are designed in different ways: some world regions have fleet average requirements (e.g., EU) whereas other world regions have targets for each car of a specific weight class (e.g., China).

over the life of a vehicle, the setting of specific targets should be based on robust cost-benefit analyses, to prevent industry from transferring the cost of compliance to consumers.

Moreover, tighter fuel economy standards only affect new vehicles while the overall fuel economy only gradually improves, considering that it can take more than 10 years to replace the fleet. In periods of recession, the turnover can be even longer, delaying the effect of regulation. In addition, car manufacturers can only influence tank-to-wheel efficiency and/or emissions, meaning that these policies do not provide proper incentives for fuel producers.

In fact, looking at the worldwide evolution of vehicle pollution control, experience shows that the biggest impacts are achieved when vehicles and fuels are treated as one single system. The EU countries and the US, with coordinated policies and specific road maps, have completed the phasing-out of leaded gasoline. Unfortunately, the adoption of cleaner fuels and vehicle emission standards in most developing countries is not coordinated, and still lacks a clear, long-term strategy.

Moreover, in developing countries, the role of the car will develop alongside the GDP and will induce pressure towards higher motorization. Consumers increasingly consider two-three wheeler solutions, as is currently the case in Asian and Latin American cities. Experience in mature markets shows that the regulation of emissions can significantly contribute to keeping levels of emissions under control. In Europe and Japan, two regions with the best performance in terms of fuel economy, motor vehicles have a track record of improvement: better engine technologies and fuels have also contributed to significant reductions in emissions of local air pollutants from new vehicles.

→Countries characterized by a growing pace of motorization should consider setting fuel economy standards to keep long-term emissions under control. Before determining the specific target, robust cost-benefit analysis should be developed upfront, ensuring affordability for consumers and large up-take in the market. A multi-stakeholder consultation process should also be promoted to agree on the most appropriate path.

→In the long run, with the increased market shares of different alternative vehicles, standards should be set in terms of energy efficiency, providing a neutral measure across all vehicle technology and different fuel-run vehicles.

Fiscal incentives, including feebates.

Fiscal policies play a role in encouraging manufacturers to adopt technologies to improve fuel efficiency and in sending consumers appropriate price signals to purchase fuel-efficient and low carbon vehicles.

Fiscal incentives are another useful instrument to reduce CO_2 emissions and fuel consumption, especially when paired with national CO_2 regulation.

These kinds of incentives can come in the form of registration fees, taxes for ownership and fuel taxes, and could encourage consumers to purchase cleaner vehicles.

Many countries pay direct subsidies on the purchase of electric vehicles in order to foster their market penetration. The FIA takes a critical view of direct subsidies which favour specific types of technologies, considering the uncertainty of a given technology holding its own without subsidies.

More recently, a new set of fiscal policies have been used by governments: the feebate programmes. These policies impose fees on inefficient vehicles and provide rebates for efficient vehicles, based on their fuel consumption. Considering that standards provide no incentive to do more than the required minimum, feebate programmes, if properly designed, create a continuous incentive for vehicle manufacturers to improve the environmental performance of their vehicles, including the most efficient ones. Moreover, a feebate system incorporates fuel efficiency into consumer decision-making, influencing consumer decisions and rewarding them immediately.

An efficient feebate program should be designed to correct for an externality. For that reason, it should provide financial incentives to consumers and manufacturers without collecting additional revenue: any fees collected should be balanced out by the rebates awarded, without imposing any net tax.

As taxes and fees are added to the cost of owning and operating a motor vehicle, **the key challenge for governments is to design fair systems that don't punish road users who need to rely on their cars.** While public transport is an important part of access to transport, it does not at present provide a sufficient alternative for many people. In particular, there is no easy way of transferring the middle distance journeys to walking, cycling, and public transport: cars will remain an important choice in transport, which needs to be integrated with other modes.

Keeping mobility affordable is essential for keeping people mobile; drivers will continue to absorb rising motoring costs, because they are dependent on their cars for a range of essential activities.

Feebate programmes are not only a consumer-oriented policy. Economic studies suggest that the main effect is actually that vehicle manufacturers improve technology across all vehicles. If the cost of technology to improve vehicle performance is less than the associated change in the feebate value, then manufacturers will implement the technology. This creates a long-term signal of the value of developing advanced technologies and technology innovation, focusing on performance. In that respect, the constant price signal is perhaps the most significant advantage of feebates over standards, particularly in those cases where there is a lack of clarity on standards 8-10 years in advance.

→Countries that have not adopted fuel economy or GHG emission standards may find feebates a good alternative. Standards require a great deal of knowledge about vehicles, technology, lead time requirements, market demographics, and future developments in order to set them properly. This knowledge is much less critical for establishing an effective feebate programme, which can be put in place while expertise and information are being developed.

→A feebate programme is a "transfer", not a "tax". Those who choose to buy higher CO_2 emitting vehicles pay fees which are used to give rebates to those who buy lower CO_2 emitting vehicles.

3. **Consider the implementation of complimentary policies.**

The regulatory approach to reduce emissions should be complemented by a specific mix of **complimentary public policies**. According to the specific conditions of the countries, the state of development of different technologies, the composition of the fleet, and the availability of infrastructure for collective transport, governments should consider:

- **Land use policies**. Land use planning instruments can lead to behavioural changes and reduce the demand for mobility. In the interim, infrastructure measures targeting congestion reduction using intelligent transport systems can create the conditions for improving transport efficiency. Moreover, it is of great importance to earmark more resources for the development of sustainable urban mobility based on high quality public transport networks.
- **Long-term urban transport planning**. By 2050 the global fleet is set to triple, with 90% of this growth taking place in developing countries, and much of that in urban areas. There will be as many cars in China alone in 2050 as there are on the planet today. By 2050, of the 2.7 billion additional urban dwellers, over 90% will live in developing countries. Long-term urban transport planning and collective-transport oriented solutions will generate a completely different path of growth in Latin America, China, and India. In these regions, ITF estimates that public-oriented urban policies can reduce CO_2 emission growth by between 30-40%, particularly if combined with stringent controls of vehicle emissions for buses.
- **Encourage no-cost measures**. Improving driver behaviour can be targeted by encouraging ecodriving skills, and favouring ecodriving training and coaching. Many of these behavioural no-cost policies (reducing excess speed, managing traffic volume and smoothing traffic flow) not only cut CO_2 emissions, but can also improve air quality, prevent accidents and tackle congestion.
- **Promoting ITS-based solutions**. Based on the available literature and the results of research, it is clear that several Intelligent Transport Systems (ITS) related measures can significantly contribute to reduce CO_2 emissions. Embedded, on-trip eco-driving support, control and coordination of traffic lights and traffic light signals, cooperative traffic lights, intermodal solutions, electronic freight exchanges, and dynamic trip planning are only some of the available applications which deliver important CO_2 reduction, particularly if deployed in an integrated manner.
- **Open data in transport**. Opening transport data means allowing its reuse in commercial and non-commercial products and services. Examples of possible services are route-planning using public geo-information or public transport data, multimodal journey-planning using timetables of different operators, or real-time traffic information. In other words, creating new opportunities for people to get around and new possibilities for industry innovation.
- **Improve consumer awareness**. This includes promoting measures to educate people on how to choose the most efficient products on the market. CO_2 labelling schemes with information on differences in fuel cost between the best performing vehicles; real-time fuel economy meters; availability and performance of high efficiency tires; feebates; tax incentives; or special exemptions for advanced technologies based on the technology-neutral approach, to promote best performing vehicles.
- **Encourage collaborative mobility-based solutions**. Technology and the adoption of the sharing economy have enabled simple and convenient access to new mobility solutions.

Services offering car-sharing, ride-sharing and taxi-hailing are emerging industries, which can play a key role in emissions reduction, particularly at the urban level.

Conclusion

The FIA recognises that continuing "business as usual" is not sustainable and will generate costs for future generations. We need to prevent this from happening.

Embracing a low-carbon future is challenging and it will not come without costs. Each country must find its own home-grown mix of solutions and implement them in a consistent way. Consumers can play a crucial role in defining consumption patterns and policy should be designed to gain public support, ensuring a high-level standard of mobility.

FIA Mobility,
Paris, November 2015