



Towards Decarbonising Transport

Taking Stock of G20 Sectoral Ambition

Imprint

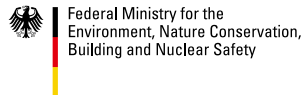
Towards Decarbonising Transport

Taking Stock of G20 Sectoral Ambition

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About

Acknowledgements

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Agora Verkehrswende

In partnership with key players in the fields of politics, business, academia and civil society, Agora Verkehrswende aims to lay the foundation for a comprehensive climate protection strategy for the German transport sector, with the ultimate goal of complete decarbonisation. This climate protection strategy is focused on

transitioning the entire transport system from fossil fuels to electricity and fuel generated by renewables. Other important aspects of the strategy include increasing the efficiency of the entire transport system by avoiding unnecessary traffic, transitioning to environmentally friendly modes of transport and increasing the efficiency of individual modes of transport. Active collaboration is required at all levels of politics to bring about the transformation of transport, from the level of national and international policy down to local municipalities. The think tank seeks to consider the necessary interaction between these various levels while striving to promote a shared understanding between stakeholders on promising ways to transition to a decarbonised transport system. Agora Verkehrswende is a joint initiative of the Stiftung Mercator Foundation and the European Climate Foundation.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) is a globally active provider of international cooperative services for sustainable development and education. As a federally owned enterprise, we support the government of Germany in achieving its objectives in the field of international cooperation for sustainable development. GIZ's Advancing Transport Climate Strategies (TraCS) project is funded through the International Climate Initiative

of the German Ministry for the Environment, Nature Conservation, Building, and Nuclear Safety (BMUB). Its objective is to enable policy makers in partner countries (Vietnam and Kenya) to specify the contribution that will be made by the transport sector to their respective Nationally Determined Contributions (NDCs). In addition, it seeks to develop detailed knowledge on mitigation potential in order to raise the level of ambition pursued by both countries. The project has a multi-level approach: At the country level, TraCS supports transport ministries and other relevant authorities by systematically assessing GHG emissions in the transport sector and calculating emission reduction potential through the development of scenarios. At the international level, TraCS organises active exchange between implementing partners, technical experts and donor organisations in order to enhance methodological coherence in the quantification of transport sector emissions. These South-South and South-North dialogues aim to increase international transparency in emissions mitigation potential while also harmonising methodological approaches in the transport sector.

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Acronyms

BEV	Battery electric vehicle
CNG	Compressed natural gas
CO₂	Carbon dioxide
COP	Conference of the Parties
ETS	Emission trading system
EV	Electric vehicle
FCEV	Fuel cell electric vehicle
G20	Group of Twenty
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HDV	Heavy duty vehicles
ICCT	International Council on Clean Transportation
ICE	Internal combustion engine
IEA	International Energy Agency
INDC	Intended nationally determined contribution
IRENA	International Renewable Energy Agency
ITF	International Transport Forum
LDV	Light duty vehicles
LPG	Liquefied petroleum gas
NDC	Nationally determined contribution
NMT	Non-motorised transport
OECD	Organisation for Economic Co-operation and Development
PHEV	Plug-in hybrid electric vehicle
REN21	Renewable Energy Policy Network for the 21st Century
SDG	Sustainable Development Goal
SLoCaT	Partnership on Sustainable Low Carbon Transport
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change



01

BACKGROUND

01 | Background

At the UN Climate Change Conference this year¹ the nations of the world will meet to advance the aims and ambitions of the Paris Agreement and achieve progress on its implementation guidelines.

G20² countries collectively account for two thirds of the world's population, but are responsible for more than 80% of current global greenhouse gas (GHG) emissions. The vast majority of these emissions, at about 8 tonnes per capita, are carbon dioxide (CO₂) emissions from burning fossil fuels to produce energy. The transport sector currently consumes more than half of global oil demand and accounts for 23% of global energy-related CO₂ emissions³, and emissions from the sector continue to grow rapidly. According to the latest Transport Outlook (OECD/ITF 2017a), CO₂ emissions could increase by 60% by 2050.

Climate action in transport is therefore a necessity to reach the goals of the Paris Agreement and keep global warming well below 2 degrees centigrade. G20 members bear the greatest responsibility for the global transport sector's impacts on air quality, climate change and energy consumption – accordingly, they are in the driver's seat. Although there is strong motivation among G20 members to reduce the climate and health impacts of the transport sector, the level of ambition on carbon abatement still varies significantly between countries. Furthermore, the implementation of measures to achieve stated ambitions in many cases falls short.

In order to highlight the crucial importance of the transport sector in this discussion, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and Agora Verkehrswende have compiled this report, which summarises the mitigation policies enacted for the transport sector by G20 countries. By providing a snapshot of efforts to decarbonise transport, we aim to show where more action is needed. Ultimately, we hope this report represents a valuable tool for the climate community to gain a better understanding of the overall status of CO₂ mitigation policies in the transport sector.

¹ COP23, from 6 to 17 November 2017.

² The G20 comprises 19 countries plus the EU. These countries are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the UK and the USA. The group is a central forum for international cooperation on financial and economic issues.

³ Including upstream emissions.



02

MOBILITY TODAY AND TOMORROW

02 | Mobility today and tomorrow

The mobility of people and goods is an essential component of today's society and our global economy. Transport systems are crucial to personal freedom, as they enable choices about where to work, live or spend free time. Yet they also fulfil a vital economic role, facilitating the international movement of goods and development of global production chains.

While the transport system of today brings many benefits, it also comes at a cost. Road fatalities and injuries are increasing; vehicle-related air pollution causes millions of premature deaths annually; and transport-related health care expenditures are substantial (SuM4All 2017). In 2013 around 1.25 million people died around the world as a consequence of road crashes, and some 50 million people suffered non-fatal injuries, about half of which were vulnerable road users, such as pedestrians and cyclists (GIZ 2017c). At the same time over 3 million early deaths were attributed to outdoor air pollution, with 75% occurring in G20 countries (Miller, Du and Kodjak 2017).

The transport sector is also an important contributor to global warming. CO₂ emissions from the sector account for 23% of energy-related greenhouse gas emissions (IEA 2016) and have increased by 30% since 2000 (OECD/IEA and IRENA 2017). They are expected to increase by another 60% by 2050, if no appropriate measures are taken (OECD/ITF 2017a).

Historically, transport activity is closely correlated with economic development. Indeed, economic growth and trade are the main drivers of transport demand (OECD/ITF 2017a). Population growth and increasing income levels also lead to increasing transportation volumes.

Growing concern for the environment, human health and safety as well as technological solutions that enable remote work and new mobility services can help to reduce rising demand for transport (SuM4All 2017).

The adoption of the Paris Agreement in 2015 represents a landmark that will require climate-related effects to be taken more prominently into consideration in policy-making and transport planning. By September 2017, 140 out of the 163 analysed NDCs (representing 190 countries) identify transport as an important source of GHG emissions and an area for action. 105 NDCs also define mitigation actions in the sector, while 23 NDCs set a specific transport GHG reduction target (GIZ 2017b).

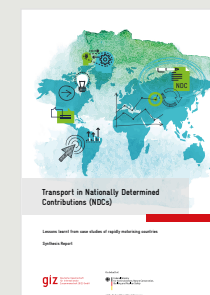
Transport in NDCs

The paper "Transport in NDCs – Lessons learnt from case studies of rapidly motorising countries" summarises a qualitative, in-depth assessment of the transport sector's role in NDC development in seven rapidly motorising countries. Based on literature research and stakeholder interviews in Bangladesh, Colombia, Georgia, Kenya, Nigeria, Peru and Vietnam, it highlights lessons learnt on NDC implementation in the transport sector and how transport can be better represented in the next generation of NDCs.

The paper concludes with recommendations for climate ministries, transport authorities and the international donor community. The study was supported by International Climate Initiative of the German Ministry for Environment, Nature Conservation, Building and Nuclear Safety.

The report can be downloaded at:

www.changing-transport.org/publication/transport-nationally-determined-contributions-ndcs/



Another important milestone, the adoption of the Sustainable Development Goals, also influences the transport sector. Sustainable transport is implicit in seven of the 17 goals and is covered directly by five targets and alluded to in seven other targets (OECD/ITF 2017a).

Transport policies face the challenge of accommodating partially conflicting demands on the transport system. On the one hand, enabling mobility is important for economic development and satisfying personal mobility needs. On the other hand, such policies should seek to minimise detrimental effects on the environment, human health and safety.

Reconciling these goals in a way that is inclusive and ensures accessibility for all is the challenge for policy-makers and transport planners of the future. Coherent and rapid action is necessary now to lay the foundation for structural change. Near-term action is essential for ensuring the transport system of tomorrow contributes its due share to climate change mitigation while also enabling safe, healthy and inclusive development.

Transport-related SDG targets		Table 2.1
	SDG 2 Zero hunger	Target 2.3. Double the agricultural productivity and income of small scale food producers (access to markets)
	SDG 3 Good health and well-being	Target 3.6. Halve number of global deaths and road injuries from traffic accidents Target 3.9. Reduce deaths and illnesses from pollution
	SDG 7 Affordable and clean energy	Target 7.3. Double the global rate of improvement in energy efficiency
	SDG 9 Industry, innovation and infrastructure	Target 9.1. Develop sustainable and resilient infrastructure
	SDG 11 Sustainable cities and communities	Target 11.2. Provide access to safe, affordable, accessible and sustainable transport systems for all Target 11.6. Reduce the adverse environmental impact of cities
	SDG 12 Responsible consumption and production	Target 12.c. Rationalise inefficient fossil-fuel subsidies
	SDG 13 Climate action	Target 13.1. Strengthen resilience Target 13.2. Integrate climate change measures into national plans
Source: OECD/ITF (2017a)		



03

G20 IN THE DRIVER'S SEAT

03 | G20 in the driver's seat

The economies of the G20 are responsible for the lion's share of economic activity. Home to 64% of the world's population, the G20 generate 80% of global GDP, use almost 80% of total primary energy and were responsible for over 80% of global energy related CO₂ emissions in 2014 (OECD/IEA and IRENA 2017).

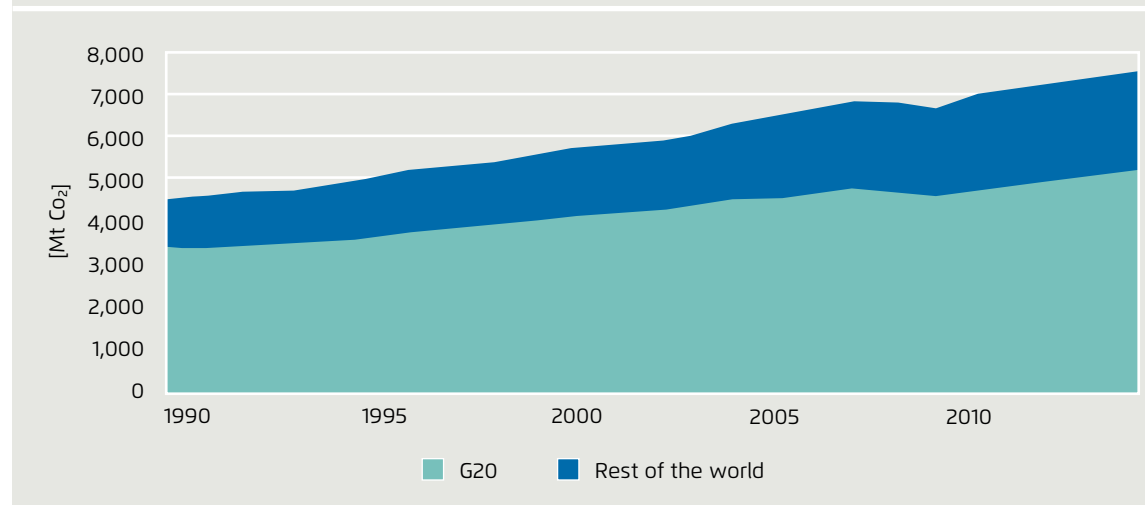
Recognising its responsibility for global emissions, at its July 2017 summit the G20 stated that the Paris Agreement is irreversible, despite the announced withdrawal of the US. The G20's strong commitment to climate action is further emphasised through the adoption of the Climate and Energy Action Plan for Growth (G20 2017b).

In the transport sector the G20 jointly emitted 74% of global emissions from fuel combustion in 1990. Despite continuing growth in emissions, this share dropped to 69% in 2014, indicating that non-G20 countries are increasing transport-related emissions at a higher rate (IEA 2016). On average, inhabitants of G20 countries emitted 1.1 t CO₂ for transport activities in 2014. The figure for the rest of the world is 0.9 t CO₂, around 20% less. Accordingly, despite growing emissions in other countries, robust action by the G20 is essential for meaningful progress in the decarbonisation of the transport sector.

Individual G20 members face divergent challenges when it comes to transport. China still has relatively low per capita emissions, but these have increased

CO₂ emissions from the transport sector 1990 – 2014

Figure 3.1



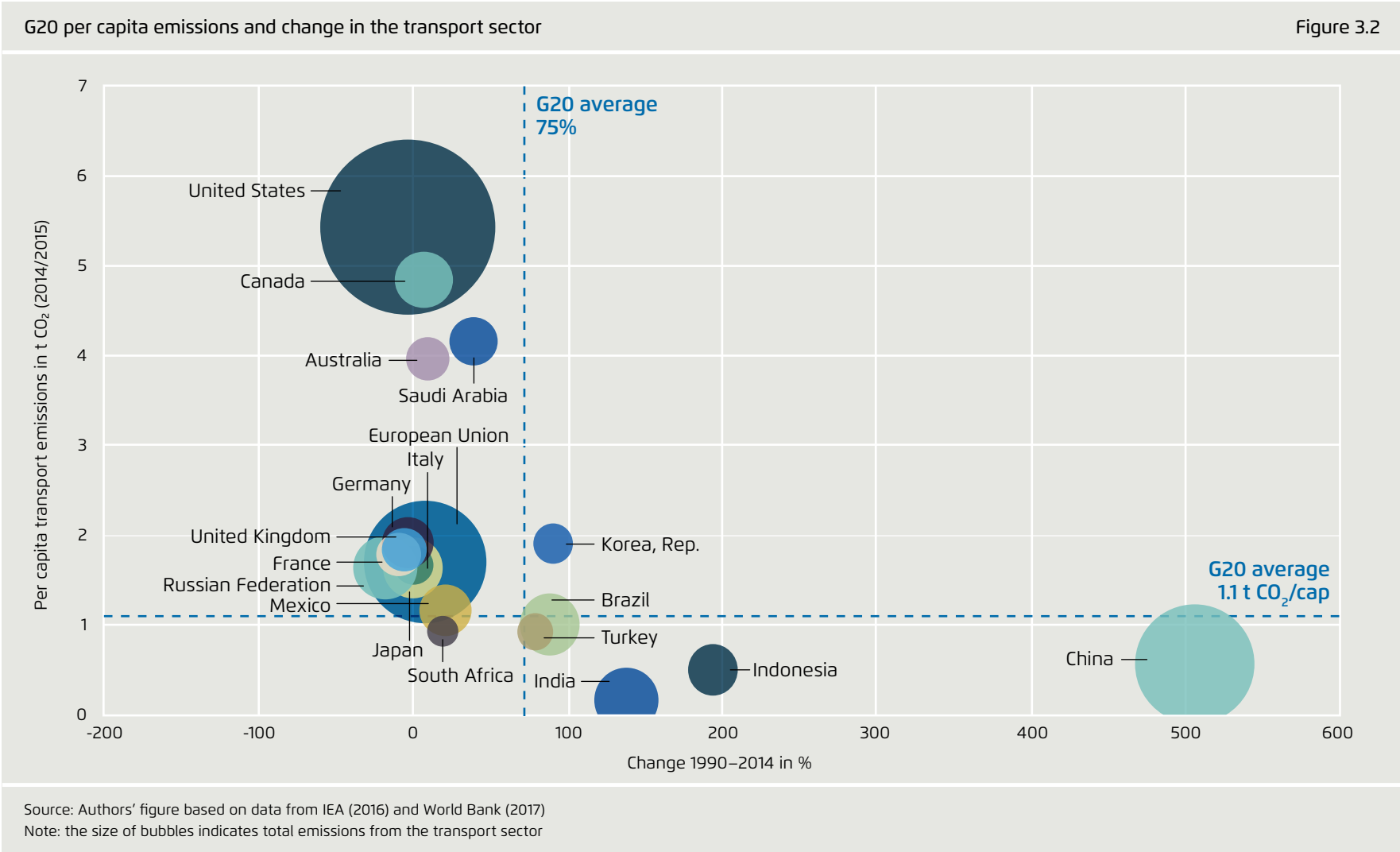
Source: Authors' illustration based on data from IEA (2016)

more than 500% to 781 Mt CO₂ since 1990, making it the third largest emitter in the sector after the US (with 1,752 Mt CO₂) and EU (with 871 Mt CO₂). Per capita emissions from transport in Indonesia and India have more than doubled, although their absolute levels remain low, due to the very low starting point in 1990.

As illustrated in figure 3.2, the US, Canada, Australia and Saudi Arabia, by contrast, have relatively high per capita emissions from the transport sector, and these figures have changed only moderately since

1990, with the exception of Saudi Arabia, which has seen a 38% increase.

These trends highlight how developed and emerging economies face different dynamics and challenges. They also underscore the need for enhanced action on all sides. While emerging economies need to address rapid motorisation and staggering growth rates in the transport sector, industrialised countries need to bring down per capita emissions, and, by extension, total emission levels.



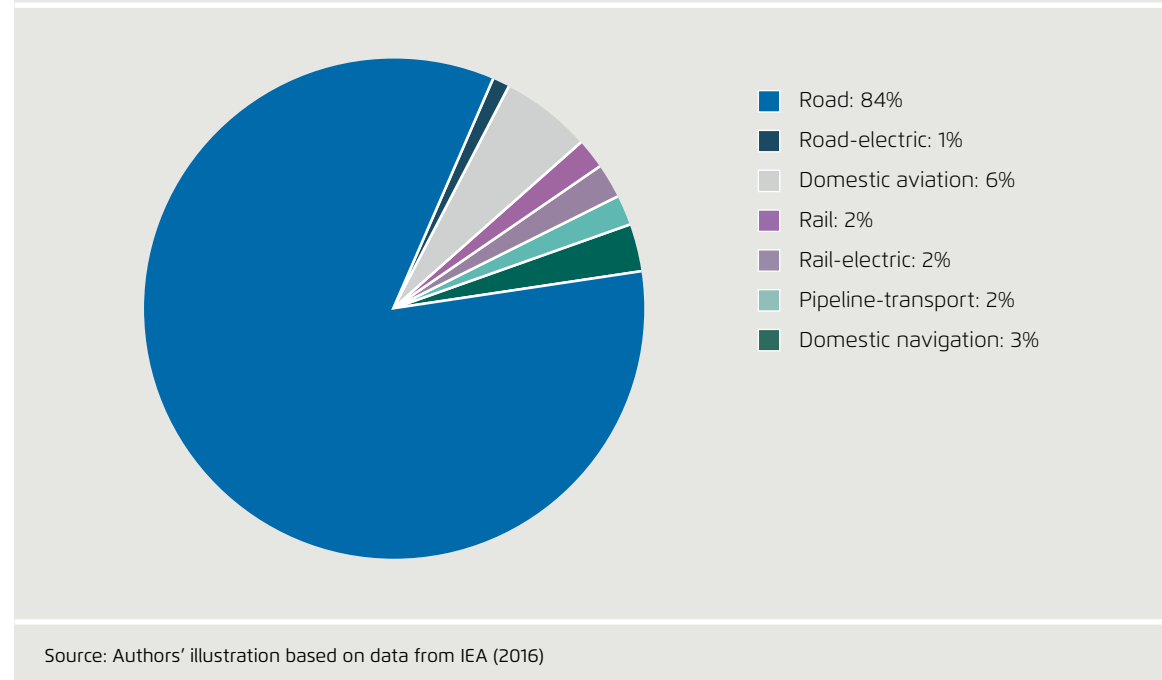
Road transport continues to be the largest source of GHG emissions in the transport sector. In the G20 it was responsible for 84% of sector emissions in 2014. With a 6% share, domestic aviation has become the subsector with the second largest emissions. However, the greatest need for action is clearly in the area of road transport.

This report analyses and describes the status of the transport sector in the G20 countries, including their level of ambition towards decarbonisation. To provide further context, the following sections emphasise the contributions that will be required from the transport sector to achieve the climate protection goals of the Paris Agreement, which seek to limit global warming to well below 2°C.

The factsheets on each G20 member shed light on the specific situation and challenges in each country, including existing goals and efforts. The report concludes by comparing stated ambition with implemented policies and actions while also considering required global reductions in the transport sector.

Share of transport subsectors in emissions in the G20, 2014

Figure 3.3





04

**THE SECTOR IS FAR FROM MEETING
THE DECARBONISATION CHALLENGE**

04 | The sector is far from meeting the decarbonisation challenge

Transport-related GHG emissions are clearly on the rise and policies so far have not resulted in an observable slowing of this trend at the global level.

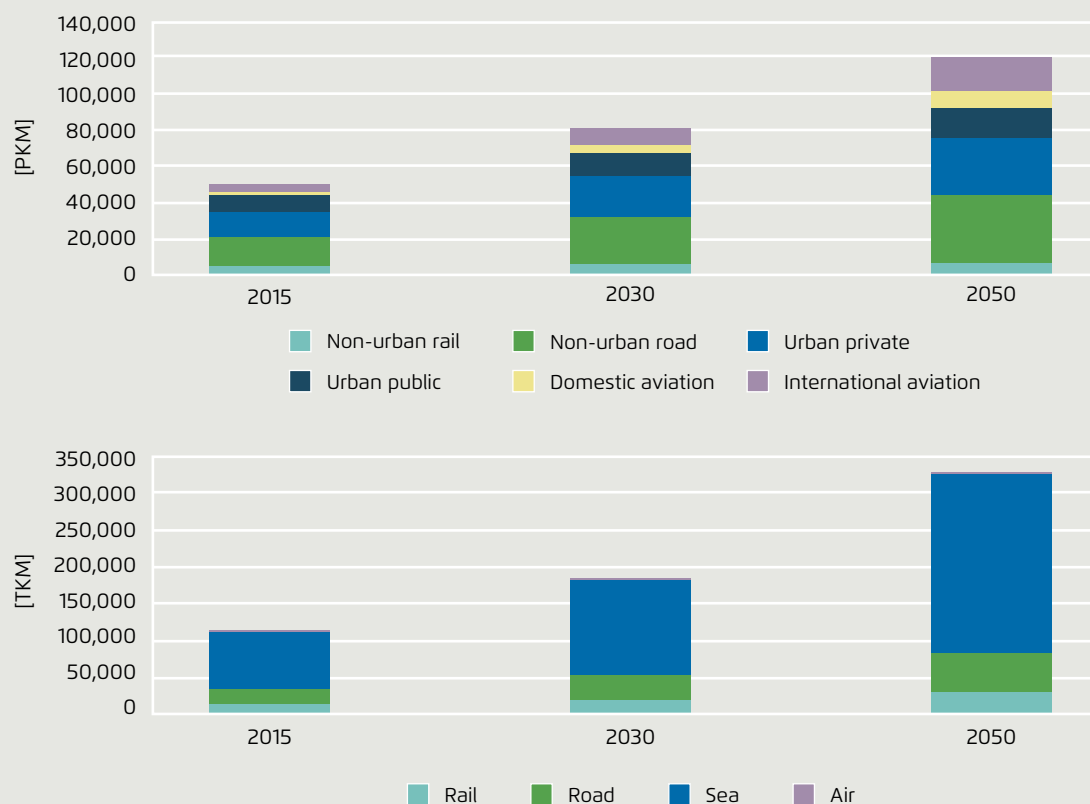
A meta-analysis of emission scenarios in the transport sector, conducted by the Partnership on Sustainable Low Carbon Transport (SLoCaT), indicates that by 2050, global transport sector CO₂ emissions could be in the range of 9 to 20 Gt (with an average of about 13 Gt, i.e. 93% above 2010) (Gota et al. n.d.).

“Continuing growth in passenger and freight activity could outweigh all mitigation measures unless transport emissions can be strongly decoupled from GDP growth” (IPCC 2014)

The International Transport Forum (ITF) comes to similar results in its recent Transport Outlook 2017. They estimate that transport demand will increase substantially until 2050 for passengers as well as freight (see figure 4.1), leading to 13.3 Gt CO₂ emissions by 2050. In passenger transport, growth will be most pronounced in road travel and aviation, with the highest growth in international aviation. Growth in the freight sector will be dominated by seaborne travel, continuing the existing trend (OECD/ITF 2017a).

Projected development of passenger and freight volumes

Figure 4.1

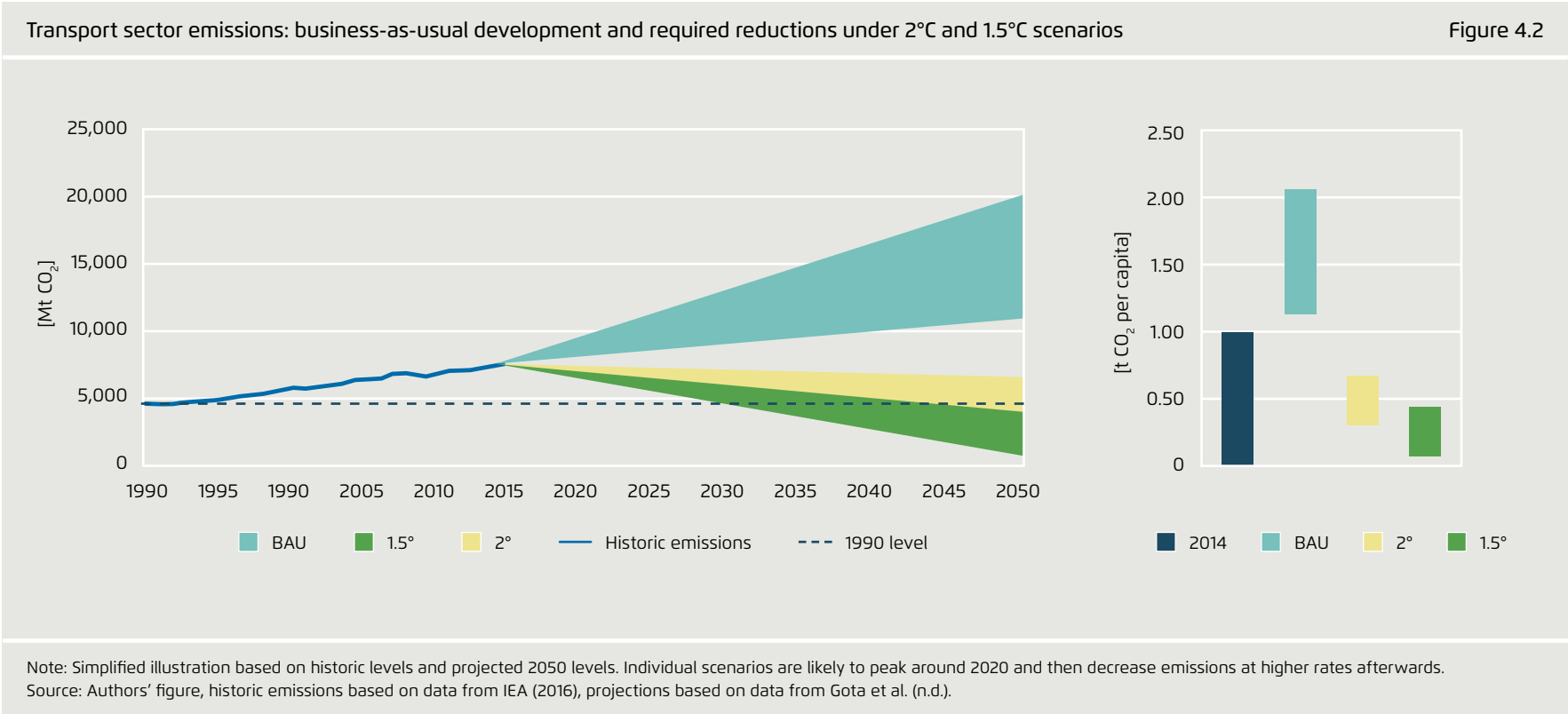


Source: Authors' figure based on data from OECD/ITF (2017a).

4.1 Low-carbon pathways require substantial reductions

2°C. Emission scenarios that are consistent with the agreed objective to limit warming below 2°C would require the transport sector to substantially deviate from historic trends. Emissions in 2050 range between

3.1 and 6.5 Gt CO₂ in different scenarios (Gota et al. n.d.), more or less reducing emissions from the sector back to 1990 levels. This assumes that all other sectors reduce emissions accordingly.



Emission reductions of the magnitude required by low-carbon scenarios rely on ambitious policies and investment in all areas. These scenarios envision changing mobility patterns, including reducing the need to travel, moving transport to more efficient modes, and enhancing vehicle efficiency. The remaining energy needs to be provided by low or zero-carbon fuels (Agora Verkehrswende 2017; Gota et al. n.d.). A vast majority of required reductions will need to be made in G20 countries (OECD/IEA and IRENA 2017).

1.5°C. To ensure that global warming remains below 1.5°C, emissions would need to be reduced to between 0.8 and 4.1 Gt CO₂ by 2050 (Gota et al. n.d.). This would mean reducing per capita emissions from the sector by up to 90% compared to current levels.

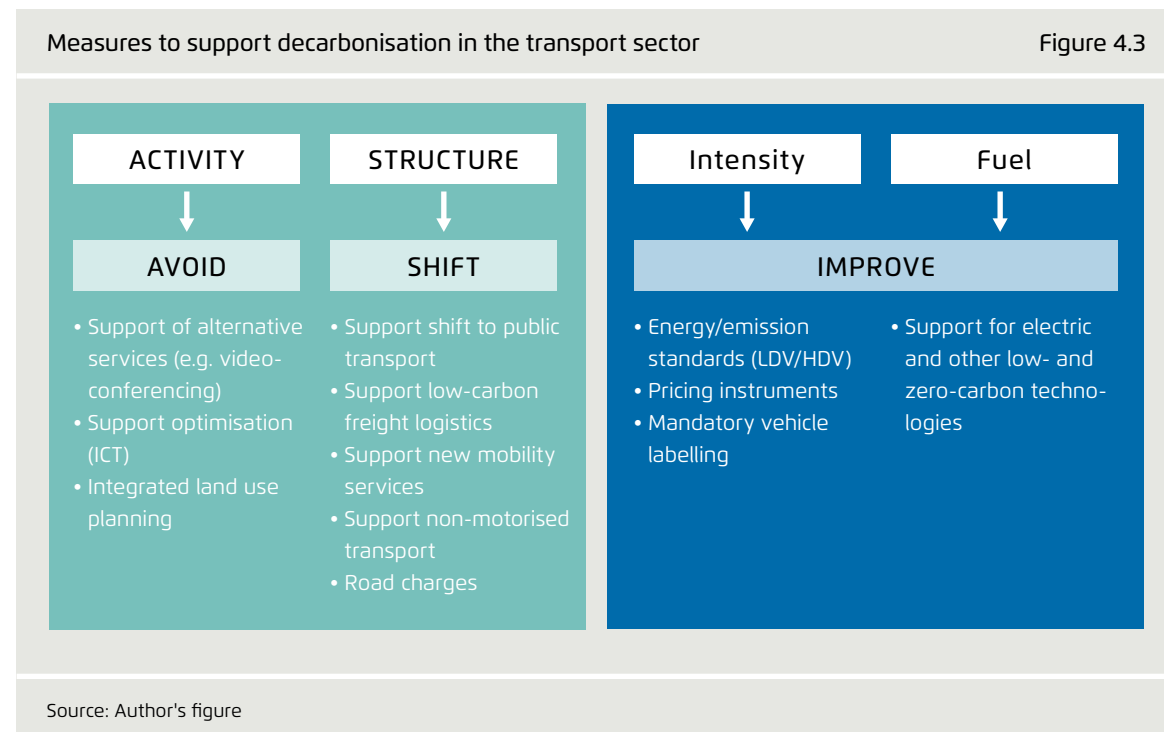
4.2 Repercussions for policies and measures

Having a clear and ambitious vision for the future of the transport sector is crucial for bringing about radical change in the movement of people and goods. In this regard, an important first step is formulating a nationally determined contribution (NDC) and setting corresponding targets in national energy policy.

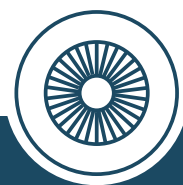
However, setting targets is a futile endeavour in the absence of clear policies and measures that will bring about their attainment. Legislators must pass laws that

encourage the testing and implementation of new ideas and concepts. Yet they must also promote the accelerated expansion of proven low carbon systems. Public transport infrastructure, for example, will be key not only to reducing GHG emissions in passenger and freight transport, but also to improving urban quality of life by reducing congestion, air pollution and traffic fatalities. Figure 4.3 summarises the most important measures to

support decarbonisation in the transport sector, building on the 'Avoid, Shift and Improve' strategic framework (GIZ 2014). Although individual measures often address more than one area, for simplicity they are assigned to where we see the main focus. Support programmes for public transport, for example, mainly target a modal shift, but often contain elements enhancing fuel efficiency.



MOBILITY



Below we outline some of the key categories of measures that will all be required to ensure that transport sector emissions are reduced to required levels. We will subsequently use these categories to assess how far G20 countries are already on track to implement-

ing measures that may – or may not – allow them to achieve their climate-related objectives. Two important categories of measures are not considered here. Policies that aim to reduce demand for passenger or freight transport – for example, by encouraging the

National programmes to support shift to public transport:

Measures that support the shift from private to public, more efficient modes of transport. Here we do not look at city planning or other activities at the local or regional levels, but only measures implemented by the national government. Measures can include:

- Incentive schemes for or investments in the construction/expansion of public transport infrastructure
- National subsidies for public transport to increase financial attractiveness to customers
- National awareness raising/marketing campaigns

Measures to support low-carbon freight logistics:

Measures that support the shift from road freight to rail and ship. This can include:

- Infrastructure investment programmes: Incentive schemes for the construction/expansion of logistics hubs that allow transfer of goods to low-carbon modes; direct investment in logistics infrastructure by national governments
- National incentive programmes for low carbon trucks/lorries (vehicle tax, road tax, retrofit programmes)
- National capacity-building programmes

National-level measures to support new mobility services:

Measures that aim to support new ways of mobility, away from individual transport (i.e. privately owned cars):

- Financial incentive schemes for shared mobility (at the regional or national level)
- National legal frameworks in place for shared mobility

local sourcing of goods, or the IT-based optimization of traffic flows – are often perceived as incompatible with the goal of economic growth and improved development. We are not aware of any country that has implemented such measures at the national level

and have therefore not included this category of policy in our assessment. Similarly, integrated land use planning is an important enabler of a sustainable transport system. Responsibility for such planning, however, generally lies with local or regional authori-

ties. We are not aware of measures at a national level to encourage such planning.

National measures to support non-motorised transport (NMT):

Measures at the national level that aim to support the shift from private motorised modes to walking and cycling:

- Incentive schemes for the construction/expansion of NMT infrastructure (pedestrian zones, bicycle lanes, etc.)
- Direct investment in NMT infrastructure
- National regulations for the design of non-motorised transport facilities
- National cycling development strategies
- Awareness raising/marketing campaigns

Road charges: This includes all road charges implemented at the national level (but not at the city level, e.g. in London), such as:

- General road charges
- Charges for individual types of roads (e.g. highways)
- Road charges for specific types of vehicles (e.g. trucks)

ENERGY



Energy/emission standards (LDV/HDV):

Regulations that impose a mandatory standard for either energy efficiency or CO₂ emissions of vehicles or vehicle fleets.

Pricing instruments:

This includes all measures that aim to favour low-carbon modes of transport via pricing incentives. This can include:

- Carbon/energy taxes (not included: vehicle taxes based on engine size)
- The inclusion of transport in emissions trading
- Subsidies for low carbon transport (when this isn't covered by any other measures, e.g. EV, road charges, public transport programmes, low-carbon freight).

Mandatory vehicle labelling:

Regulations that impose mandatory labelling of vehicle energy efficiency and/or CO₂ emissions.

Support mechanism for electric vehicles & charging infrastructure:

This includes measures that target the uptake of actual deployment of EV (battery and plug-in hybrid), not research and development. It includes:

- Incentive programmes (tax benefits, direct payments, etc.) for the purchase of electric vehicles
- Infrastructure programmes for building or supporting charging infrastructure
- Regulations that provide special benefits for electric vehicles (such as preferential parking, separate lanes, etc.)
- Regulations that mandate an electric vehicle quota.

Support for other low-carbon fuels and propulsion systems:

This includes in principle the same measures as for electric vehicles, but related to low-carbon fuels (biofuel, hydrogen, CNG, etc.).

G20 Transport Sector Factsheets: Our Contribution to Enhanced Transparency



The country factsheets (*as shown in Chapter 8*) aim to provide a comprehensive snapshot of the transport sector in each G20 member country. We spotlight factors impacting the transportation needs within a country, such as population, per capita GDP, land area and the urbanisation rate.

The factsheets also highlight transport sector emissions as a share of total emissions while illuminating both historical trends and prospective future developments under a business-as-usual scenario. Our mobility indicators provide insight into motorisation rates and transport volumes, while our energy-related indicators show fuel use, gasoline and diesel prices as well as the status of electric vehicle adoption. Furthermore, factsheets look outside of the 'transport box', providing some information on the closely linked power and biofuel sectors.

Data availability in the transport sector is limited and the quality of data is often poor. When available, we have used consistent datasets, such as those from the World Bank, the IEA and the International Transport Forum. In some cases, we supplement these data with other sources. Accordingly, the data are not necessarily fully comparable between countries. However, they effectively serve their main purpose: to enhance our understanding of the situation in individual countries, and identify significant differences between countries. Information on all data sources can be found in annex.

1990

2000

2010

We do not assess implemented measures with a view to their stringency or how far they are able to achieve stated goals or the objectives of the Paris Agreement. The factsheets present measures that from their design or intention could potentially contribute to mitigation. National sources are not always available in English. Due to resource constraints, we were not able to analyse all potentially relevant documents, so additional measures may exist.

A core aim of the factsheets is to assess the level of ambition in each nation, including the steps taken to implement the measures we have identified. NDCs represent the key vehicle for ambition at the international level. The factsheets summarise each country's overall commitment, transport related targets included in the NDC, and mitigation measures relevant to transport. Additionally, we show the national targets that countries have set for the transport sector or individual subsectors, if they exist.





05

**TAKING STOCK: IS THE G20
ON THE RIGHT PATH?**

05 | Taking stock: Is the G20 on the right path?

Focus on transport remains low at the international level

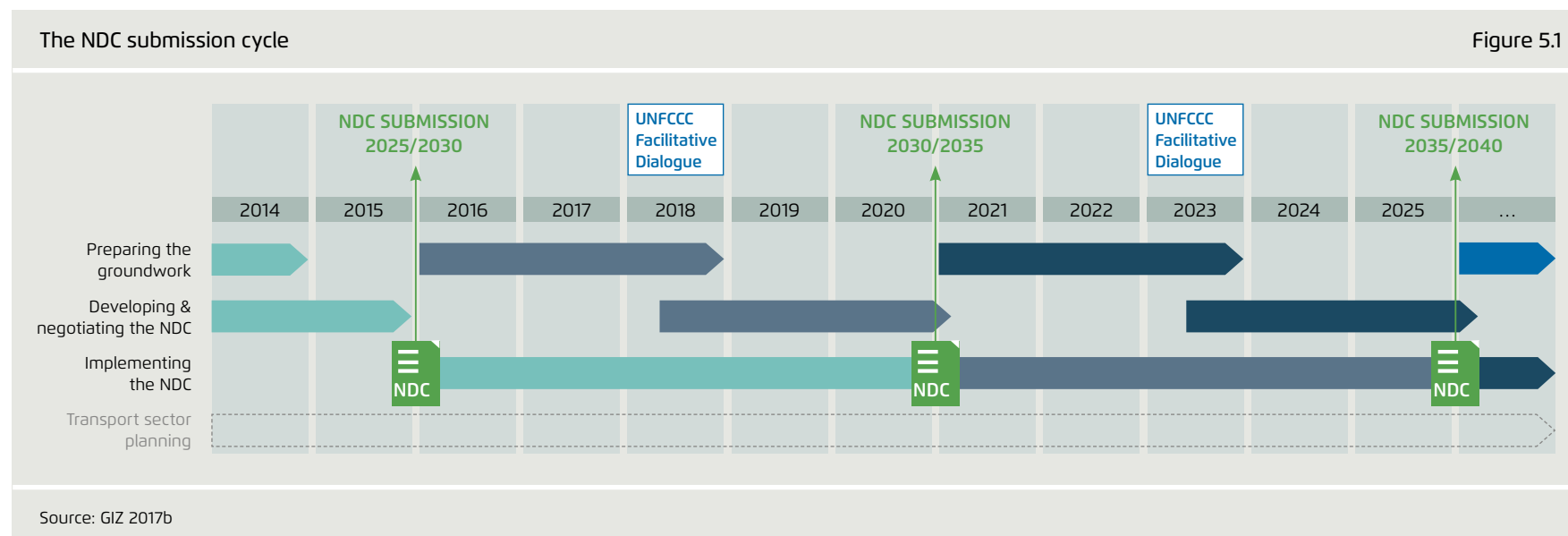
The nationally determined contributions (NDCs)⁴ submitted to the UNFCCC represent a unique opportunity for countries to develop a vision for low-carbon development for all sectors. While the time frame for developing the initial NDCs was extremely short, many countries for the first time engaged in a process to assess mitigation options and come to a common understanding of future development. For all its shortcomings and despite the fact that the aggregate ambi-

tion is not sufficient to achieve agreed objectives (UNFCCC 2016), the value of this process cannot be underestimated.

Although transport is mentioned in the majority of NDCs as an important source of GHG emissions, only 23 countries set a transport specific target, while 105 countries define mitigation actions in the sector (GIZ 2017b). Within the G20, only Japan (27% below 2013 by 2030) has communicated a quantitative GHG emissions target for the sector. However, Germany (40–42% below 1990 by 2030) and France (at least 70% below

2013 by 2050) have communicated sectoral targets in their long-term strategies submitted to the UNFCCC in 2016/17. Brazil, China, India and South Africa mention in NDCs quantitative targets related to individual measures and 12 out of the 20 countries mention specific transport-related measures. By contrast, the EU does not make any reference to mitigation in the transport sector in its NDC.

⁴ Not all parties have ratified the Paris Agreement, so their intended nationally determined contribution (INDC) is used in this analysis. In regard to the G20, this applies to Turkey and the Russian Federation.



Australia, South Africa and the US only mention one transport related mitigation measure, while India, Japan and Turkey present a wide range of strategies to reduce emissions in the sector. A few countries also include quantitative goals for individual measures, such as Brazil's 18% target for sustainable biofuels, Canada's 30% target for urban public transport, India's 36% to 45% target for rail in total land transport, and South Africa's 20% target for hybrid-electric vehicles.

While G20 countries devote less attention to the transport sector than non-G20 countries in their NDCs, all countries globally show a concern for improving passenger transport, promoting efficiency and adopting alternative fuels (Partnership on Sustainable Low Carbon Transport 2016). Nevertheless, all countries will need to significantly step up their ambition for the transport sector in the next round of NDC submissions to meet the objectives of the Paris Agreement.

The process established by the Paris Agreement requires each country to submit NDCs on a cyclical five-year basis, and each submission must be progressively more ambitious than the last. Many countries are already beginning to prepare their next NDC submissions, and the Facilitative Dialogue in 2018 will help to support this process. We hope this report encourages countries to quantify transport-sector targets and to build upon their vision for the measures to be implemented.

National ambition exceeds NDC targets, but still falls short

Generally, G20 countries show more ambition in national policy than at the international level. Five G20 countries have set quantitative GHG emission targets for the transport sector in their national strategies or legislation. Four of these have additional quantitative targets related to specific technologies or efficiency. China has set intensity targets for individual transport subsectors. Furthermore, seven of the G20 countries have quantitative targets not related to GHG emissions. Both Mexico and Saudi Arabia have adopted qualitative long-term goals. *Table 5.1* provides an overview of national transport-related targets.

One explanation for the discrepancy between national and international ambition may be the short time frame provided to prepare the NDCs. This discrepancy shows there is room for stepping up ambition in the transport sector. Nevertheless, even the national targets remain insufficient for limiting global warming well below 2°C.

Overview of transport-related targets in national strategies or legislation			Table 5.1
COUNTRY	SPECIFIC NATIONAL TARGETS FOR THE TRANSPORT SECTOR	SOURCE	
Argentina	Argentina has set a 5.9 MtCO _{2e} reduction target for the transport sector by 2030.	National Transport and Climate Change Action Plan	
Australia	No specific national targets for the transport sector.	The Sixth National Communication of Australia	
Brazil	Brazil has set a 48–60 MtCO _{2e} reduction target for the transport sector by 2020 through increased use of biofuels.	National Climate Change Plan (PNMC) 2008	
Canada	No specific national targets for the transport sector.	Canada's Mid-Century Long-Term Low-Greenhouse Gas Development Strategy 2016	
China	30% Public transport share in large and medium-sized cities, 5% CO ₂ emissions reduction per road revenue passenger kilometre, 13% CO ₂ emissions reduction per road freight tonne kilometre, 15% CO ₂ emissions reduction per unit of railway traffic volume, 13% CO ₂ emissions reduction per unit of waterway traffic volume, 11% CO ₂ emissions reduction per unit of civil aviation traffic volume, 4.8 million electric vehicle charging points are to be built by 2020.	National Plan on Climate Change (2014–2020) GIZ Sustainable Transport in China	
European Union	The EU does not have a specific emission target for the transport sector at the EU level, but the Renewable Energy Directive sets the following targets: • Minimum 10% share of renewables in final energy consumption of the transportation sector by 2020. • Biofuels and bio-liquids should contribute to a reduction of at least 35% of GHG emissions in order to be recognised. On 1 January 2017, this emissions savings requirement was increased to 50%.	Grantham Research Institute	

Overview of transport-related targets in national strategies or legislation

Table 5.1

COUNTRY	SPECIFIC NATIONAL TARGETS FOR THE TRANSPORT SECTOR	SOURCE
France	In 2009 France set the target of reducing greenhouse gas emissions from transport to their 1990 level by 2020. The Low Carbon Strategy submitted to the UNFCCC sets a target to reduce transport emissions by 29% compared to 2013 levels by the third carbon budget, and by at least 70% by 2050. In July 2017, France set the goal to taking greenhouse gas emitting cars off the market by 2040.	Law no 2009-967; National Low Carbon Strategy 2016; Climate Plan 2017
Germany	The National Climate Plan 2050 sets an absolute target for 2030 at 95–98 MtCO_{2e}. The Energy Strategy from 2010 sets the target to reduce primary energy consumption in the transport sector by 10% by 2020 and 40% by 2050. The National Sustainability Strategy 2016 set targets to reduce primary energy consumption for passenger transport and freight by 15–20% by 2030 compared to 2005. The German government has also set the target of 1 million electric vehicles by 2020.	National Climate Plan 2050; Energy Strategy 2010; National Sustainability Strategy 2016
India	India does not have a specific national emission target for the transport sector, but the National Electric Mobility Mission Plan 2020 sets a target of 30–35% share of CNG vehicles in new vehicle sales by 2020 and foresees 5–7 million electric vehicles by 2020.	National Electric Mobility Mission Plan 2020

Overview of transport-related targets in national strategies or legislation		Table 5.1
COUNTRY	SPECIFIC NATIONAL TARGETS FOR THE TRANSPORT SECTOR	SOURCE
Indonesia	Indonesia does not have a specific national emission target for the transport sector, but the National Master Plan for Energy Conservation (RIKEN) sets goals for efficiency for different sectors. A 2014 draft version of the RIKEN that will set a 20% efficiency target for the transport sector (against BAU) is awaiting approval.	IEA Policy Database
Italy	No specific national targets for the transport sector.	/
Japan	Japan does not have a specific national emission target for the transport sector, but the 2016 Plan for Global Warming Countermeasures introduces a target of 50% to 70% for the market share of next-generation low-emission vehicles in new automobile sales in 2030.	Energy Policies of IEA Countries. Japan. 2016 Review
Korea, Rep.	As part of its Low Carbon, Green Growth vision, the transport sector is expected to reduce GHG emissions by 34.3% below BAU by 2020, providing the largest sectoral reduction to contribute to the overall national target. Additionally, the government announced to take steps to make clean vehicles account for 30% of all vehicles by 2020.	BUR 2014; Asian NGV Communications
Mexico	Mexico does not have quantitative transport specific national targets, although the long-term strategy outlines a qualitative vision for the next 10, 20 and 40 years.	Mexico's Climate Change Mid-Century Strategy 2016
Russian Federation	The Transport Strategy of the Russian Federation does not set mandatory targets, but the measures aim to reduce specific carbon dioxide emissions in road transport by 20–22% by 2030, and by 50–51% in rail transport compared to 1990 levels.	BR 2016

Overview of transport-related targets in national strategies or legislation

Table 5.1

COUNTRY	SPECIFIC NATIONAL TARGETS FOR THE TRANSPORT SECTOR	SOURCE
Saudi Arabia	Saudi Arabia does not have transport specific national targets, although the „Vision 2030“ sets out qualitative objectives to increase usage of public transportation and improve efficiency of railways.	3 rd National Communication; Vision 2030
South Africa	The National Energy Efficiency Strategy 2005 sets a national energy intensity target of 12% by 2015, with the transport sector contributing with a 9% improvement in intensity relative to a 2000 baseline. The draft post-2015 revision of the strategy includes a 20% reduction in average vehicle energy intensity (MJ/km) by 2030, relative to a 2015 baseline.	Department of Energy
Turkey	The Climate Change Action Plan 2011–2023 sets out the following targets: - Increasing the share of railroads in freight transportation from 5% in 2009 to 15%, and in passenger transportation from 2% in 2009 to 10% by 2023. - Increasing the share of seaways in freight transportation from 2.6% of tonne-kilometres in 2009 to 10%, and in passenger transportation from 0.37% of passenger-kilometres in 2009 to 4%. - Decreasing the share of highways in freight transportation from 80% of tonne-kilometres in 2009 to below 60%, and in passenger transportation from 90% of passenger-kilometres in 2009 to 72%.	Climate Change Action Plan 2011–2023
United Kingdom	The Carbon Plan from 2011 aims for transport emissions to be 17%–28% lower than 2009 levels by 2027. The government’s goal is for nearly all new cars and vans to be zero emission vehicles by 2040 and for nearly the entire stock of cars and vans to consist of zero emission vehicles by 2050.	Grantham Research Institute; Clean Air Strategy 2017
United States	No specific national targets for the transport sector.	US Mid-Century Strategy for Deep Carbonization 2016

5.1 Reality check: existing measures not yet sufficient

So how much progress have G20 countries made in implementing measures to achieve stated goals? Our analysis can only partially answer this question. While we have highlighted policies that could positively impact future developments, we do not assess whether individual measures are adequate for achieving stated targets, let alone the objectives of the Paris Agreement. In any event, considering observed emission trends, it is clear that existing measures are, in sum, not yet sufficient.

"In sum, current measures are not yet adequate, but it is generally easier to ratchet up existing measures than to implement new ones." (GIZ, Agora 2017)

The existence of abatement targets for transport indicates that governments have moved from developing visions to implementing actions. And while these actions are in most cases not yet adequate, it is generally easier to ratchet up existing measures than to implement completely new ones. Our report highlights clear gaps in existing policy, yet to quantify these gaps – particularly with relation to the 2°C and 1.5°C pathways – additional research would be needed.

G20 collaboration

Since the adoption of the Energy Efficiency Action Plan in 2014 the G20 countries have been collaborating on the issue of vehicle efficiency, especially for heavy duty vehicles (G20 2014). In 2016, the 'Leading Programme' translated the action plan into a long-term plan (G20 2016). The programme is supported by the Transport Task Group (TTG), with technical support from the International Council on Clean Transportation (ICCT) and the Global Fuel Economy Initiative (GFEI).

Mobility

Measures that aim to support low-carbon mobility choices are summarised in *table 5.2*. Most countries focus on support for public transport and low-carbon freight logistics. Support for new mobility services is lacking in almost all G20 countries and only half of the countries have any type of measure to support non-motorised transport. Road charges are used in 12 countries as a pricing instrument to motivate a shift to other transport modes.

 existing

	National programmes to support shift to public transport	Measures to support low-carbon freight logistics	National-level measures to support new mobility services	National measures to support non-motorised transport	Road charges
Argentina					
Australia					
Brazil					
Canada					
China					
EU					
France					
Germany					
India					
Indonesia					
Italy					
Japan					
Korea, Rep.					
Mexico					
Russian Fed.					
Saudi Arabia					
South Africa					
Turkey					
UK					
United States					

Note: The existence of measures does not imply their adequacy. Source: See annex I.

Energy

As illustrated in table 5.3, two thirds of the countries have implemented mandatory vehicle labelling and biofuel targets, and even more countries have support measures for other low-carbon fuels. Only 14 of the 20 have mandatory energy or carbon related emission standards for light duty vehicles.⁵ The largest gap in implementation remains in efficiency standards for heavy-duty vehicles. Only four countries have implemented such standards so far.

"There are huge gaps in the implementation of energy or CO₂ related emission standards for vehicles and in support for new mobility and non-motorised transport." (GIZ, Agora 2017)

⁵ In Australia LDV standards are currently under discussion, but not yet in force.

 existing

Overview of existing energy measures across G20 countries

Table 5.3

	Energy/ carbon emission standards LDV	Energy/ carbon emission standards HDV	Pricing instru- ments	Mandatory vehicle labelling	Support mech- anism for elec- tric vehicles AND charging infrastructure	Mandatory biofuel targets	Support for other lowcar- bon fuels & propulsion systems
Argentina						✓	✓
Australia				✓	✓		✓
Brazil	✓				✓	✓	✓
Canada	✓	✓	✓	✓		✓	✓
China	✓	✓		✓	✓		✓
EU	✓		✓	✓		✓	✓
France	✓		✓	✓	✓	✓	✓
Germany	✓		✓	✓	✓	✓	✓
India	✓		✓	✓	✓	✓	✓
Indonesia			✓				✓
Italy	✓			✓	✓	✓	✓
Japan	✓	✓	✓	✓	✓		✓
Korea, Rep.	✓		✓	✓	✓	✓	✓
Mexico	✓		✓		✓	✓	✓
Russian Fed.			✓				✓
Saudi Arabia	✓			✓			
South Africa				✓		✓	
Turkey				✓	✓	✓	
UK	✓		✓	✓	✓	✓	✓
United States	✓	✓	✓	✓	✓	✓	✓

Note: The existence of measures does not imply their adequacy.

Source: See annex I.

5.2 Closing the loop: consistent policymaking necessary

National policies, laws and regulations that impact transport sector emissions have developed over an extended time frame and are not always fully consistent. While there may be ambition to decarbonise the sector, counterproductive measures are often in place that work against this goal. While such measures can take many forms, we take a closer look at fossil fuel subsidies. We also examine two issues of relevance to transforming transport: the sustainability of biofuels and the carbon-intensity of the power sector.

Fossil fuel subsidies

In 2009 the G20 agreed to “phase out and rationalize over the medium term inefficient fossil fuel subsidies” (G20 2009). Since then, government price controls over transport fuels have been eliminated or reduced in many countries, including Brazil, Mexico and most recently Indonesia. Direct subsidies for fossil transport fuels are also decreasing in most countries, but many direct and indirect subsidies remain in place. Most G20 members support specific fuel uses, such as agriculture, or specific types of fuels, such as diesel, LPG and CNG. Aviation also benefits in many countries from tax exemptions or breaks.

Further direct investment and indirect subsidies are provided in some countries for the exploration and production of oil and oil products. Such support is at

cross purposes with the measures introduced to support efficiency and low-carbon modes of transport (Bast et al. 2014).

Sustainability of biofuels

Expanded deployment of biofuels has a strong emphasis in many G20 countries. The sustainable sourcing of these fuels thus needs to be ensured. While 15 of the G20 members have mandatory biofuel targets and three more have set non-mandatory biofuel targets, only ten have mandatory sustainability criteria. A further two have voluntary guidelines (Canada) and subsidies tied to certain sustainability criteria (China).

Power sector linkage

With growing electrification of transport, the GHG intensity of power generation becomes increasingly relevant. GHG effects from electrification are closely tied to the grid emission factor and future developments in the power generation sector. True decarbonisation can only be achieved with a fully decarbonised electricity generation system.

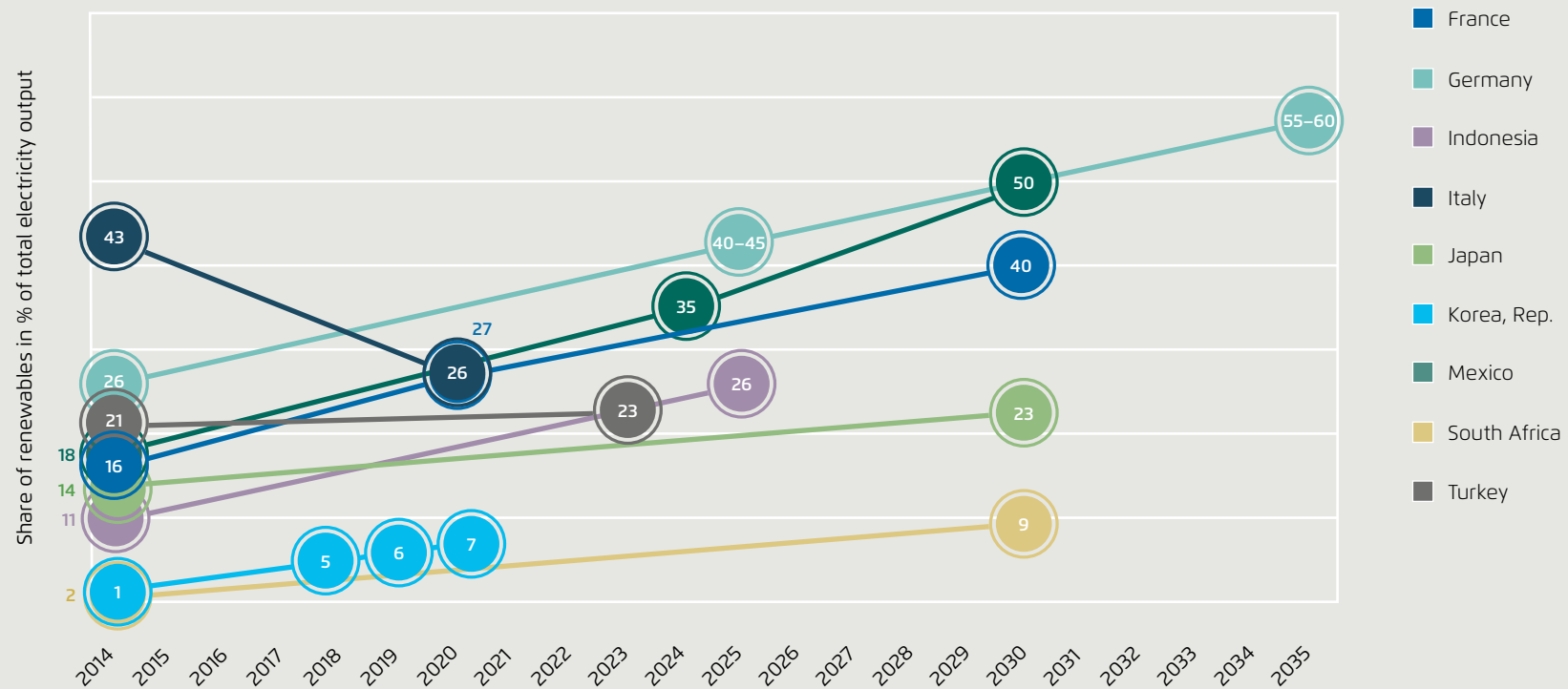
Only three G20 members – Canada, the UK and the US – have not set national targets for renewable electricity generation. Within Canada, all 10 provinces have set renewable energy targets. While Canada, the US and Mexico have agreed to source 50% of the

region’s electricity from non-carbon sources by 2025 (REN21 2017), it is unclear how far this commitment will be implemented, particularly under the new US administration.

Target levels for renewable power vary widely and are not easily comparable due to different time frames and units used. Also, the starting points are very different, *as illustrated in figure 5.2*. Countries are generally planning increasing levels of renewable electricity generation, although with varying speeds of deployment. Current ambition levels will not allow the full decarbonisation of power generation over the medium term. All countries except Canada have support mechanisms in place at a national level to promote investment in renewables.

Share of renewables in electricity output and targets for selected G20 members

Figure 5.2



Note: Only G20 members with targets expressed in share of renewable electricity output (including hydro) are shown.

Source: REN21 (2017), World Bank (2017)



06

THE WAY FORWARD

06 | The way forward

More ambition and action needed at the national level

Ambition needs integrated visions for the sector.

Our analysis shows that more ambition is needed in the transport sector to achieve the objectives of the Paris Agreement.

As Japan was the only G20 member that included a specific transport target in its NDC, it is not possible to quantify the sector-specific emissions gap to the 2°C and 1.5°C pathways for individual countries. However, since overall ambition is already falling short and transport is under-represented in the G20 NDCs, there is a clear need for countries to adopt a comprehensive vision for transforming the transport sector.

In specific terms, countries need a vision for how they can bring about a low-carbon transport system. This vision must take into account potentials for technological advancement, changing mobility patterns, and the development of new infrastructure. Currently we already see individual measures going in the right direction, but they are not integrated into a coherent strategy that will allow meaningful progress.

Filling the gaps.

While some topics are high on the agenda of many G20 members, other topics still require more attention:

- Fuel economy and CO₂ emission standards have proven to be an effective instrument for enhancing

vehicle efficiency. Countries that have not yet implemented such standards should consider adopting international best practices for light and heavy duty vehicles.

- New mobility services and non-motorised transport can play an important role in the low-carbon and sustainable urban transport of the future. Accordingly, they should be enabled and supported with additional measures.
- The sustainability of biofuels needs to be ensured in all countries, particularly when biofuels are supported as a transport fuel of the future.

Strengthen and complement existing measures.

More analysis is needed on the adequacy of existing measures, but observed trends indicate they will not be sufficient to 'bend the curve'. Fuel efficiency and emission standards will need to become increasingly stringent in the near- to mid-term.

Our identification of categories where measures have been adopted does not mean no further action is needed. Existing measures need to be ramped up and complemented by additional measures to enable future declines in passenger and freight transport emissions. There is a clear need for urban mobility planning that shortens travel distances, promotes non-motorised and zero-carbon transport options, and integrates new mobility solutions.

Eliminate fossil-fuel subsidies.

Many countries have started to reduce fossil-fuel subsidies, but overall subsidy levels are still distorting the market, giving carbon-intensive modes of transport at an undue advantage. Revenues spent or forfeited on fossil-fuel subsidies could instead be used to support low-carbon fuels, promote new propulsion systems, enhance the availability of public transport, or make it more affordable. Eliminating effects that distort the price of fossil fuels would also support a higher share of renewables in the power mix. As electrification is an important tool in many countries for addressing local air pollution, a shift towards fully renewable power generation would help to reduce GHG emissions in the power sector while also supporting zero-carbon transport options.

Strengthen collaboration.

The need for more integrated approaches to land use and urban planning, increasing levels of electrification and the introduction of biofuels all require the engagement of a multitude of actors. To ensure a regular exchange of information as well as the development of integrated strategies and innovative solutions, there is a need for collaboration between stakeholders in various sectors and fields, including policymakers, technical experts, civil society representatives and business leaders. If countries manage to harness their combined knowledge and develop viable planning for gradually phasing in new systems while and phasing-out old ones, sustainable transport systems should be within reach.

G20 collaboration should expand beyond energy efficiency

Strengthen existing activities on efficiency.

Since the start of the collaboration on vehicle efficiency, a number of G20 members have introduced efficiency standards for light and/or heavy duty vehicles. Future work should build on this success and aim to strengthen these standards towards zero emissions in the near- to mid-term.

Support collaboration on addressing mobility solutions.

Decarbonisation of the transport sector will not be possible without addressing mobility choices and supporting alternative low-carbon modes of transport. Collaboration within the G20 could facilitate the exchange of best practices, collaboration on research and information sharing regarding new mobility solutions, supported by new technologies and increasing digitalisation.

Engage in dialogue with industry.

As G20 countries account for around 90% of global vehicle sales (G20 2016), it is within the purview of the G20 to dialogue with key industry players.

Transport needs to move up on the international agenda

Set clear targets for the transport sector.

The decarbonisation of transport has gained momentum with the formulation of the first NDCs, but no pathways have been defined for how to achieve a transformation in the sector. The NDC cycle with the stocktake in 2018 and submission of updated contributions every five years provides an excellent opportunity for countries to engage with all transport sector stakeholders to develop a clear and ambitious vision for the sector. This vision could be translated into clear and transparent targets for the sector to strengthen the position of national governments in taking advanced action at home.

Enhance action on international aviation and maritime shipping.

This analysis looked at national ambition and associated measures. It did not consider international aviation and maritime shipping, which are currently not covered under the commitments under the UNFCCC. Nevertheless, they represent a growing share of future transport sector emissions and will need to contribute to the decarbonisation of the sector (OECD/ITF 2017a). Parties to the UNFCCC need to emphasise the important role of these sectors and ensure ambitious measures are implemented.

Enhance technical and peer exchange on transport.

The technical expert meeting on transport, hosted by the UNFCCC during the Bonn Climate Change Conference in May 2016, was a good start for elevating the status of transport in climate negotiations. The regional meetings on cross-cutting issues in urban development also address transport as an important issue. The relevance of transport for climate change and many of the sustainable development goals should be further promoted, and more room should be provided for an exchange of ideas, information and best practice.

Ensure technical support for implementation and transparency.

Information is an essential foundation for decision-making. In addition to data on transport volumes and structures, decision-makers require knowledge about the latest technological developments, solutions and experiences with implementation in other countries. The availability of high quality data is scarce in many countries, particularly in the developing world. A number of organisations and initiatives⁶ are working to improve the availability and quality of data and information. These efforts should be supported and expanded to provide policy-makers a sound basis for their decisions.

⁶ Such as the International Transport Forum (ITF), the World Bank's SUM4ALL Initiative, or the NDC Partnership.



07

G20 OVERVIEW

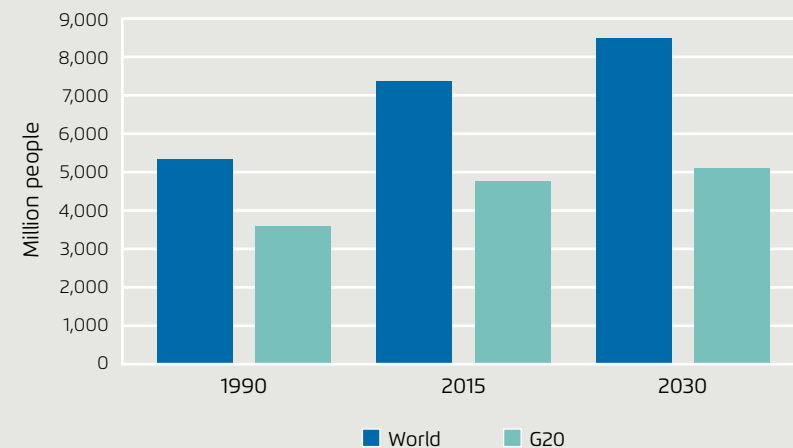
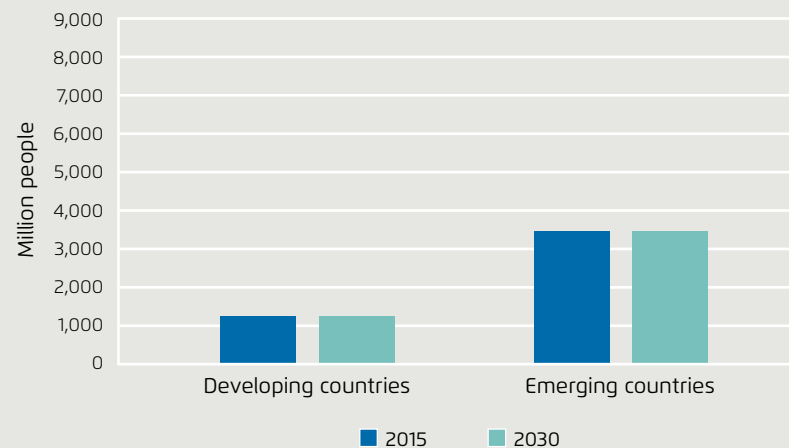
07 | G20 overview

Population

Population is expected to grow another 8% (or 0.5% annually) over the next 15 years within the G20, increasing the need for mobility services. Population growth within the G20 is occurring exclusively in emerging economies; growth in developed countries is stagnant.



Population developments globally (left) and within the G20 (right)



Note: Developed countries include Australia, Canada, the EU, Japan, Russia, Turkey and the US.

Source: Authors' figure based on data from UNDESA (2015), World Bank (2017)

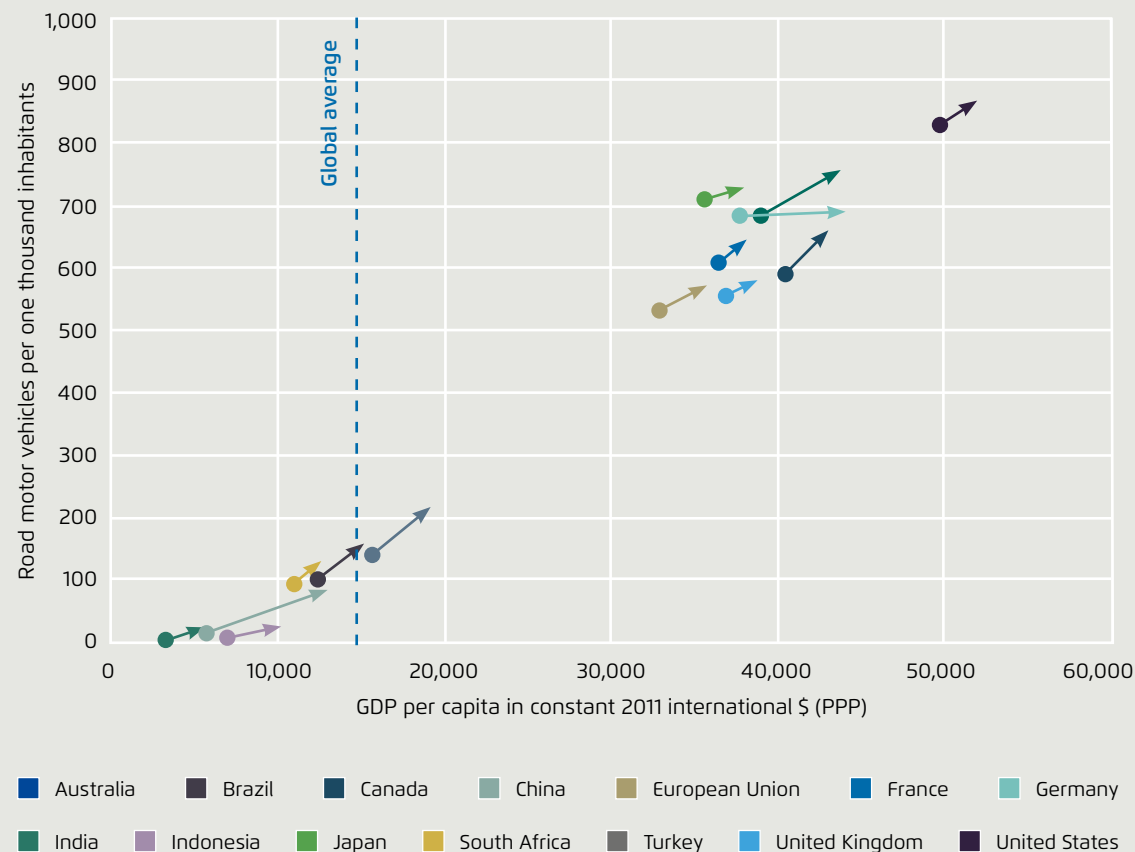
Development of per capita GDP and vehicle ownership in selected G20 countries 2005–2015

The figure shows a strong relationship between per-capita income and vehicle ownership.⁷ It also illustrates the clear divide between emerging economies and developed countries within the G20. To achieve needed levels of decarbonisation, car ownership will need to peak in the medium term.

The trend towards greater private vehicle ownership in conjunction with population growth is resulting in increased travel by car (as measured in passenger-kilometres) and increased freight transport (as measured in tonne-kilometres). The trend towards greater overall travel distances can be observed in all countries, despite the large differences in growth. Only a few G20 countries have seen growth in transport activity slow or reverse in recent years, such as Japan and the UK (OECD/ITF 2017a).

⁷ Data related to vehicle ownership are difficult to obtain and are not always comparable between countries, as vehicle registration systems vary. Nevertheless, we can assume that available data are suitable to illustrate broad trends.

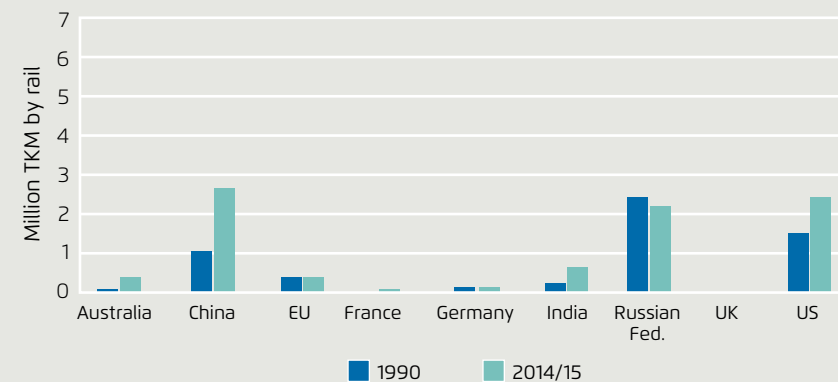
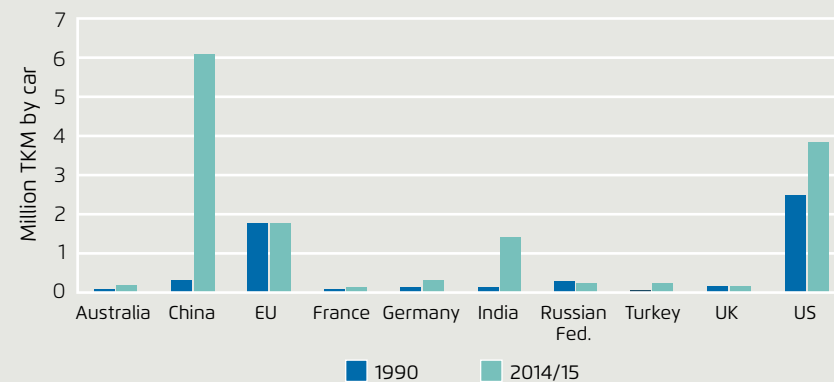
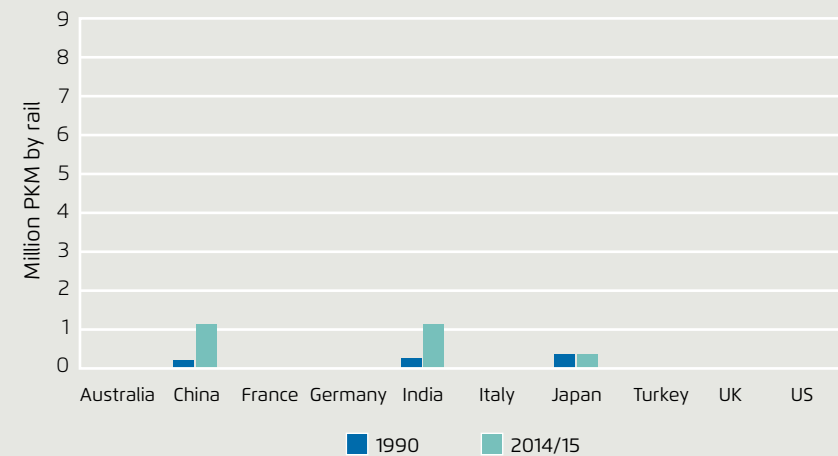
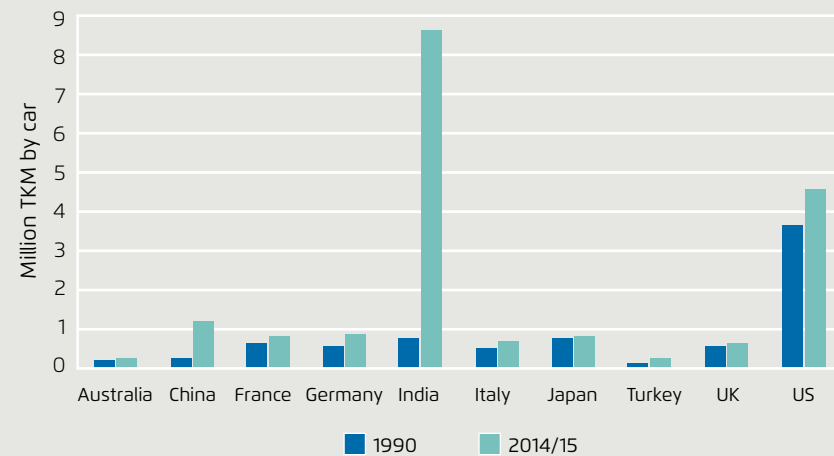
Development of per capita GDP and vehicle ownership in selected G20 countries 2005–2015



Source: Authors' figure based on data from ACEA (2017); OECD/ITF (2017a, 2017b), World Bank (2017).

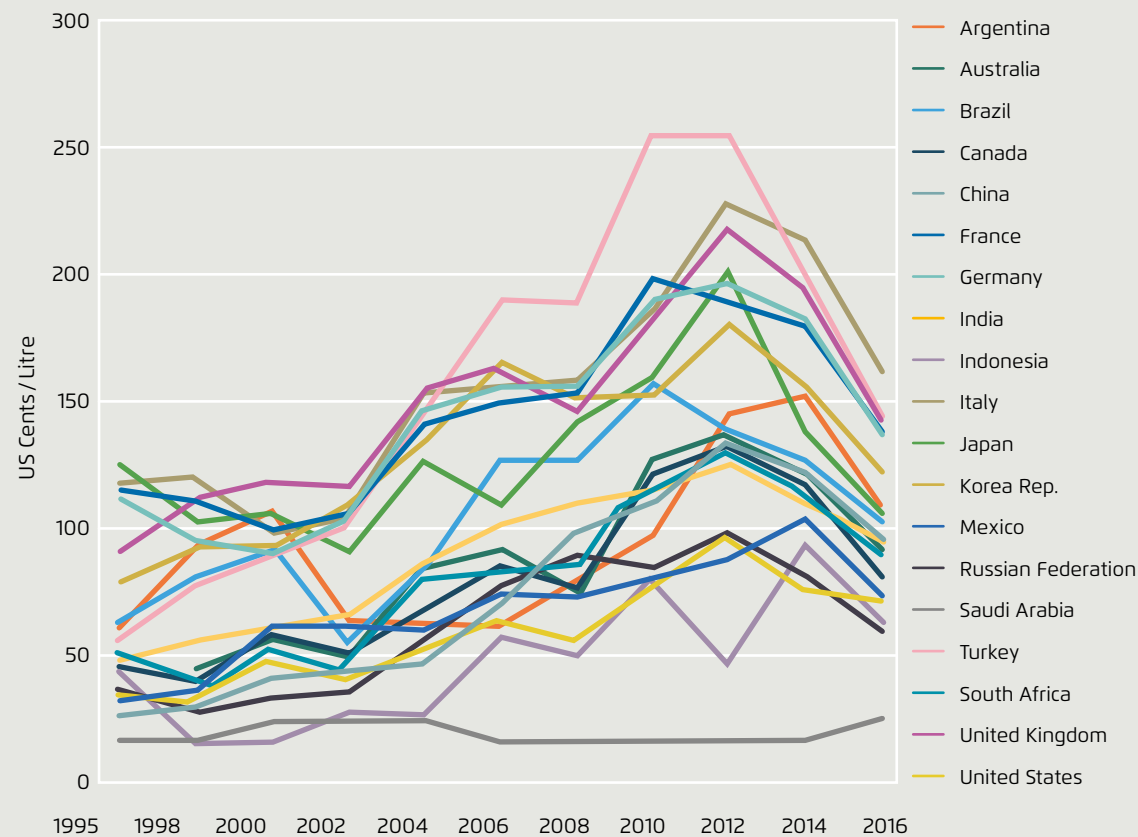


Development of travel volumes by car/road and rail in selected G20 countries 1990–2015



Source: Authors' figure based on data from OECD/ITF (2017b)

Development of gasoline prices in G20 countries 1995–2016



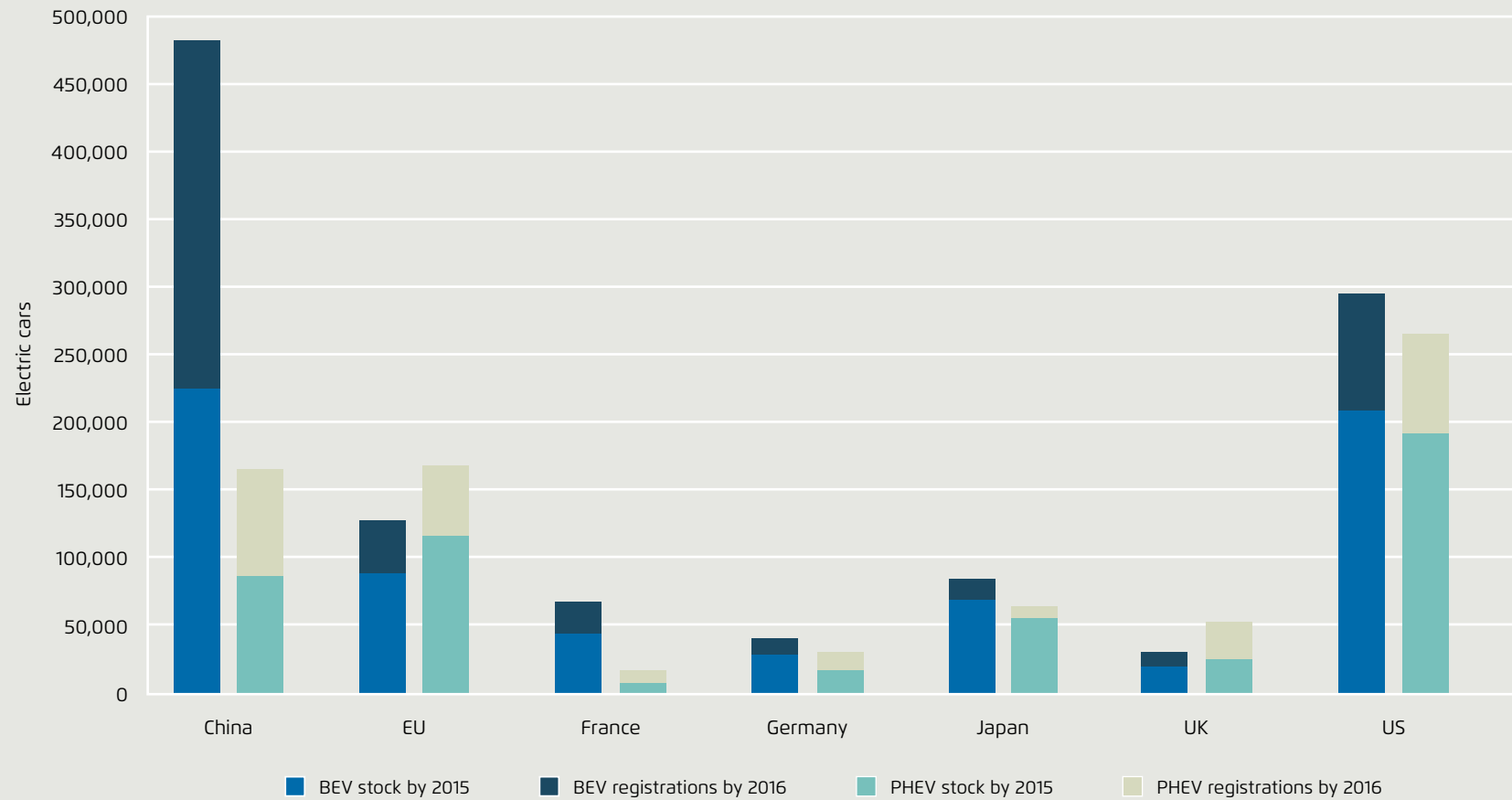
Source: Authors' figure based on data from GIZ (2017a).

Development of gasoline prices in G20 countries 1995–2016

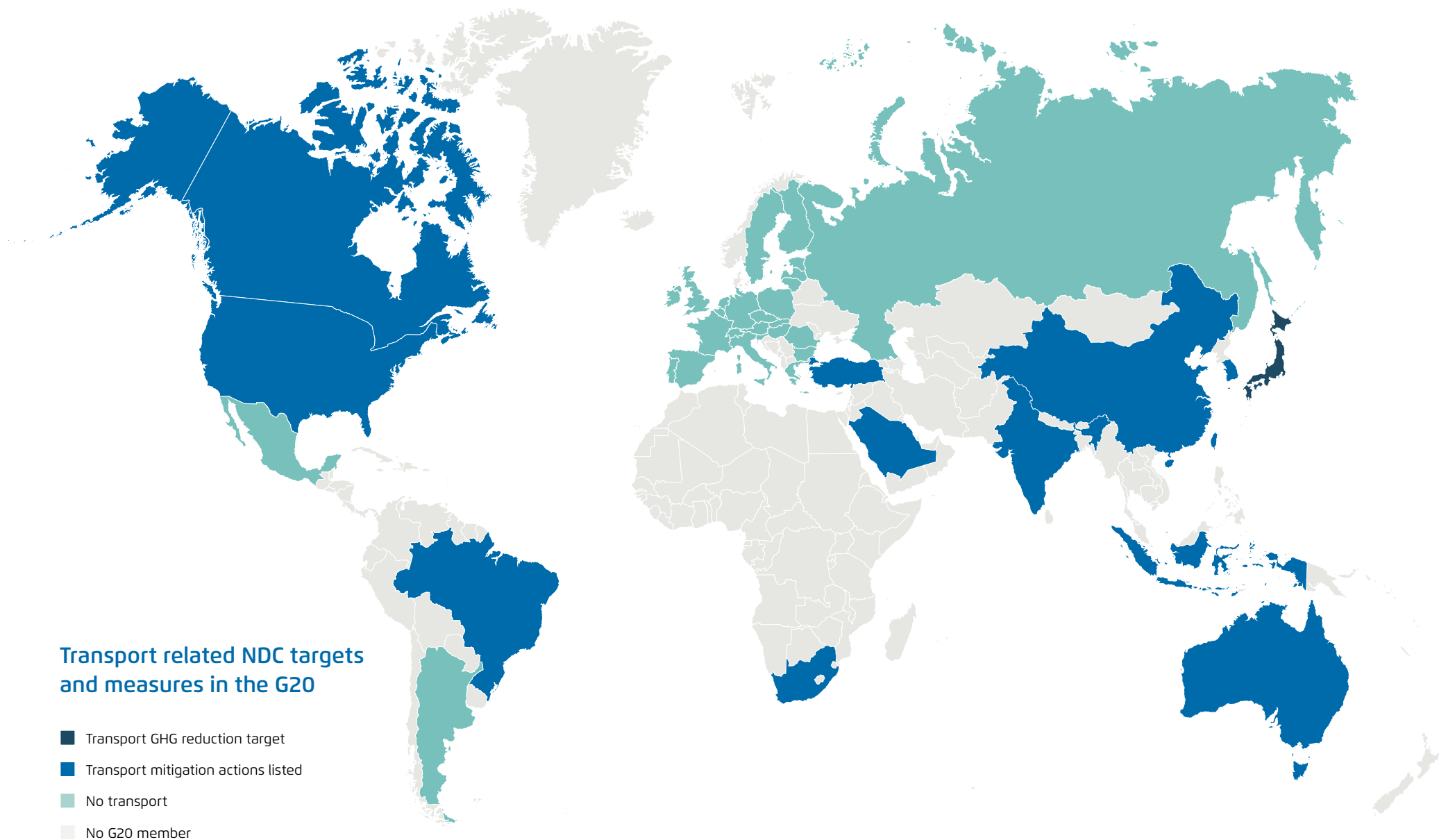
Fuel prices vary strongly between G20 members. In 2012, the highest price within the G20 (Turkey) was almost 16 times as high as in Saudi Arabia. And although prices have dropped since, gasoline in the most expensive country (Italy) was still almost 7 times higher than in Saudi Arabia in 2016 (GIZ 2017a).



Electric car stock in selected G20 countries



Source: Authors' figure based on data from IEA (2017a)

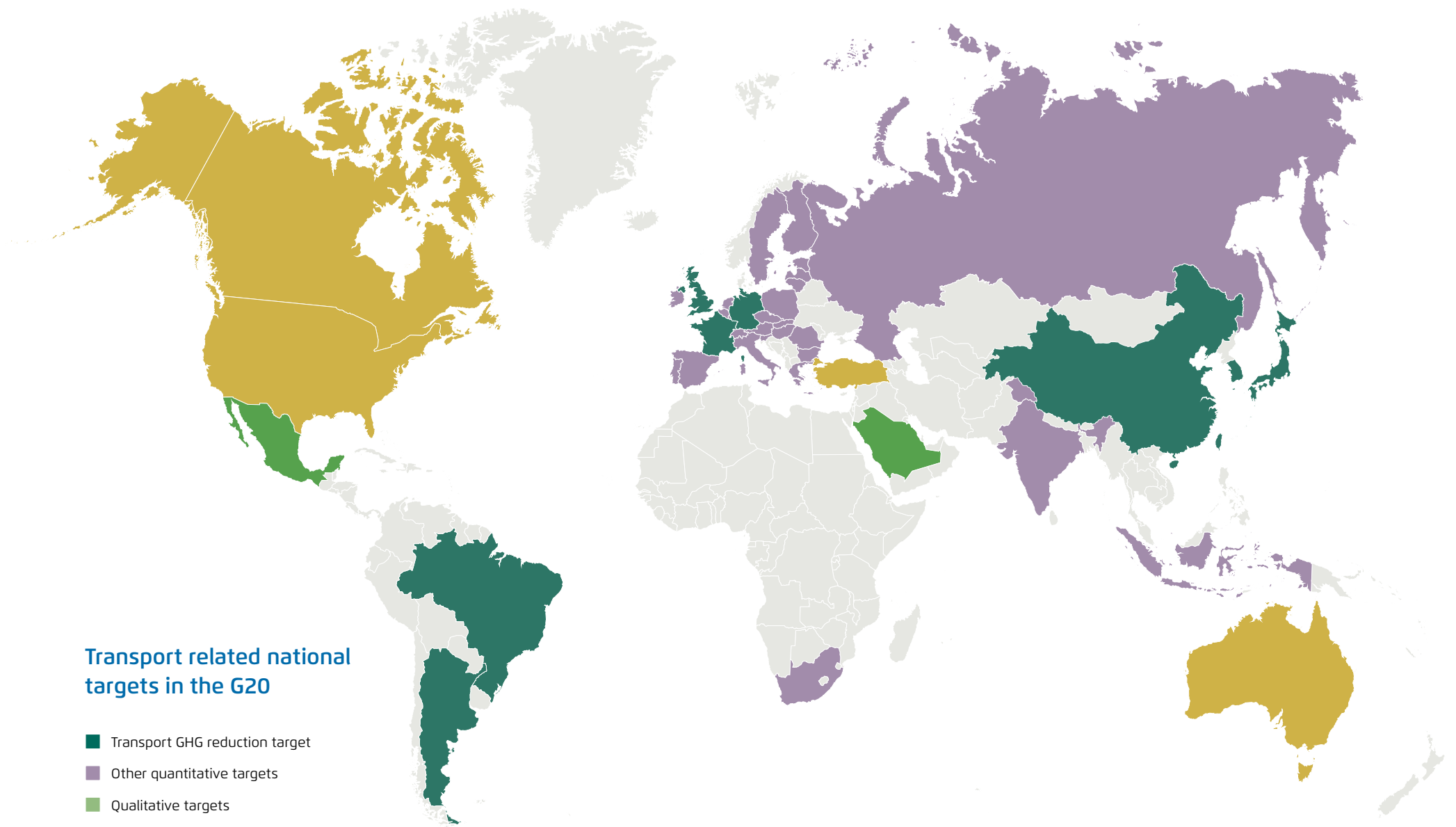


Transport related NDC targets and measures in the G20

- Transport GHG reduction target
- Transport mitigation actions listed
- No transport
- No G20 member

Source: NDC and INDC submissions to the UNFCCC

Note: Argentina submitted its NDC in 2016. It does not contain any mention of transport specific measures, unlike the INDC originally submitted in 2015.



Transport related national targets in the G20

- Transport GHG reduction target
- Other quantitative targets
- Qualitative targets
- No targets
- No G20 member

Source: See annex

Implementation

A number of initiatives at the G20 level are relevant to the transport sector and aim to support members in implementing measures:

- G20 Energy Efficiency Leading Programme (EELP)
- G20 Energy Efficiency Investment Toolkit
- Voluntary Action Plan on Renewable Energy adopted under the Chinese Presidency
- G20 Toolkit of Voluntary Options on Renewable Energy Deployment adopted under the Turkish Presidency
- Commitment to rationalise and phase out, over the medium-term, inefficient fossil fuel subsidies that encourage wasteful consumption, recognising the need to support the poor
- Energy Efficiency Hub (planned)



Source: Annex to G20 Leaders Declaration: G20 Hamburg Climate and Energy Action Plan for Growth (G20 2017a).



08

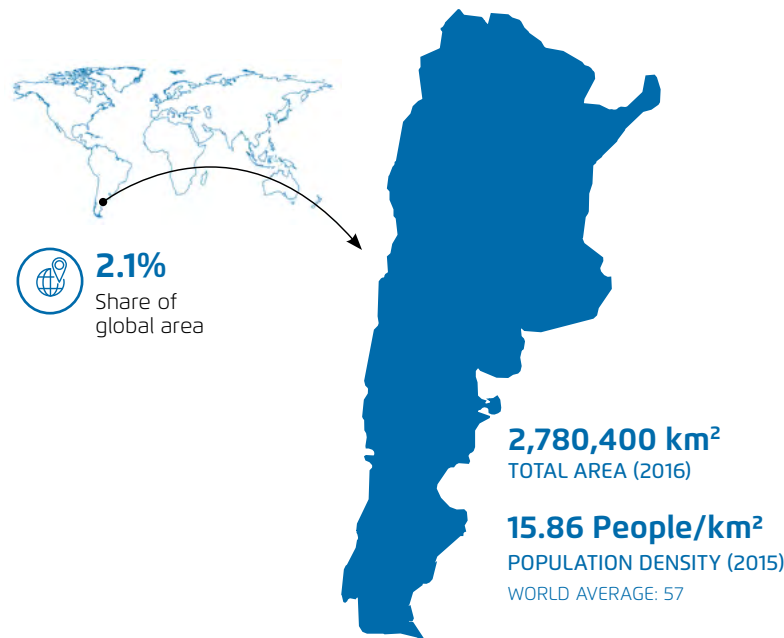
COUNTRY FACTSHEETS

ARGENTINA

Argentina is characterised by long travel distances and a high level of urbanisation, with over 90% of the population living in urban areas. Travel between cities relies almost exclusively on road transport, including well-developed and low-cost bus services. With increasing affordability, air transport has been growing in importance. Although the country operated an extensive state railway system into 1990s, and still has the 8th largest rail system in the world, rail transport is negligible today. The government is aiming to revive the rail system, and re-nationalised the railway operator in 2015. Urban transport as well as cargo rely mostly on road transport, with the exception of Buenos Aires, which operates a metro system and tram lines.

Argentina revised its original INDC, moving from an 18% below BAU emissions reduction target to an absolute emission target of less than 483 Mt CO_{2e} by 2030. It has not set any targets for the transport sector. While undertaking significant steps to revive rail transport for passengers and freight, Argentina lacks policies to support alternative modes of transport and energy efficiency. It is one of the few G20 countries that has not yet implemented CO₂ or energy efficiency standards.

Source: 3rd National Communication 2015; CIA World Factbook; Encyclopedia Britannica



Sources: World Development Indicators



0.83 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



19,102 constant 2011 international \$ (PPP)

GDP PER CAPITA (2015)

1,000 \$



G20
AVERAGE:
18,379



WORLD
AVERAGE:
14,725



0.77%

SHARE IN GLOBAL GDP (2015)



POPULATION

43.4 mio people

POPULATION CURRENT
IN 2015

0.6%

SHARE IN GLOBAL
POPULATION IN 2015



URBANISATION

91.8% of total

URBAN POPULATION
IN 2015

74.86%

G20 AVERAGE¹

53.86%

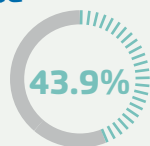
WORLD AVERAGE



19,081,407 people

POPULATION IN URBAN
AREAS OF > 1 MIO (2015)

SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

552 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE
(2014)

1 = 100 Inhabitants

1 = 100 Motor Vehicles



No data (passenger-km)

PASSENGER TRANSPORT
VOLUME*



No data (tonne-km)

FREIGHT TRANSPORT
VOLUME**



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: knoema

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting



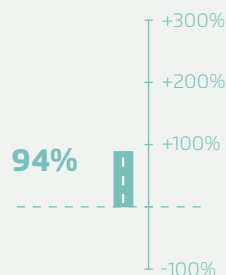
TOTAL EMISSIONS

Argentina's total CO₂ emissions from fuel combustion have increased by 94% since 1990. The overall upward trend slowed during the economic crises of 2000 and 2009. Emissions in the transport sector have increased by 64% over the same period. Under business-as-usual, transport emissions are expected to grow between 3% and 76% up to 2030. Road transport is the subsector with the largest emissions.

192.41 Mt CO₂



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2014)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2014)

4.43

G20 Average¹:
8.4

World Average:
5

t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990-2014)



SHARE IN GLOBAL EMISSIONS (2015)

0.59%

Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

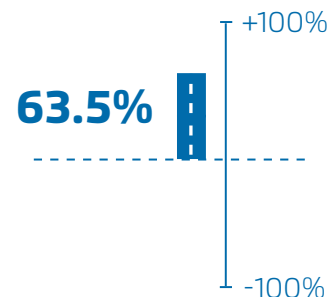


TRANSPORT SECTOR EMISSIONS

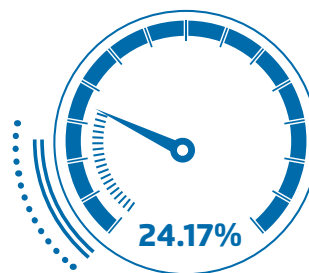
46.50 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2014)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990-2014)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2014)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2014/2030)



2015

1.07

G20 Average¹:
1.11

2030

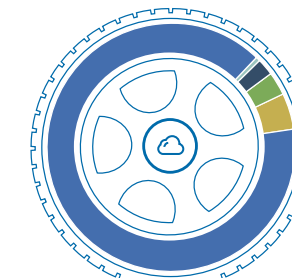
1.35

G20 Average¹:
2.33

t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

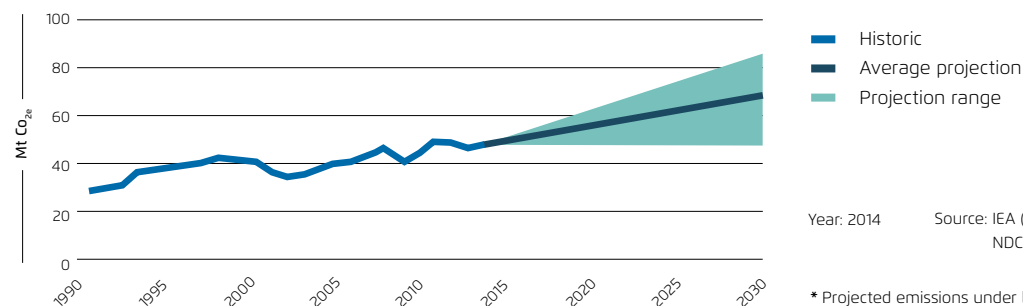
Transport emissions by subsector



Road: 89.5%
Rail: 0.5%
Domestic Navigation: 2.3%
Domestic Aviation: 3%
Pipeline: 4.7%
Other: 0%

Year: 2014 Source: IEA

Historic and projected* emissions in the transport sector



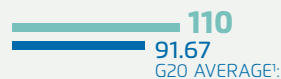
Year: 2014 Source: IEA (historic), SloCaT (projections), NDCs, national sources (targets)

* Projected emissions under business-as-usual scenario

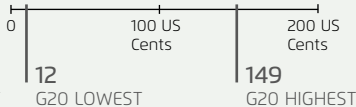


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

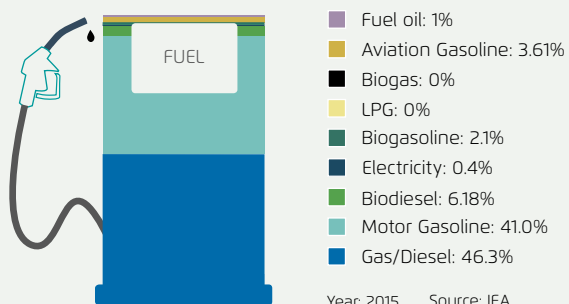


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



Year: 2015 Source: IEA

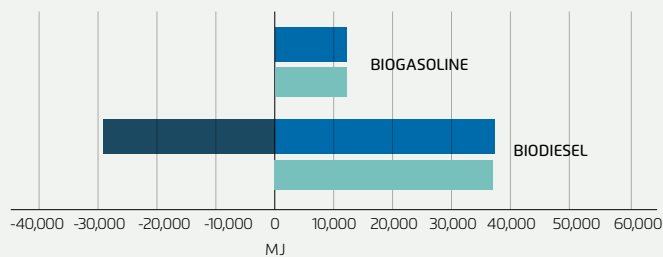
SHARE OF BIOFUELS IMPORTED (2015)

0%



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



ELECTRIC VEHICLES

NO DATA
(TOTAL STOCK OF
ELECTRIC CARS)

NO DATA
(NEW REGISTRATIONS OF
ELECTRIC CARS)

NEW
REGISTRATIONS
2016

NO DATA (BATTERY)
NO DATA (PLUG-IN HYBRID)

TOTAL STOCK

NO DATA (BATTERY)
NO DATA (PLUG-IN HYBRID)

0 100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000

Year: 2016

NO DATA (MARKET
SHARE OF ELECTRIC
CARS IN THE NATION-
AL MARKET)

%

NO DATA
(SHARE OF NEW
REGISTRATIONS IN
TOTAL EV STOCK)

%

NO DATA (PUBLICLY
ACCESSIBLE
CHARGE INFRA-
STRUCTURE)

SLOW CHARGE

FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

NO DATA (SHARE OF
ELECTRIC CARS IN
TOTAL PASSENGER
CAR STOCK)

%



LINKAGES TO THE ENERGY SECTOR

The majority of electricity in Argentina is generated using natural gas, and a third of power generation is from hydro. The 2007 feed-in tariff law set an 8% target for renewable energy consumption by 2017 and mandated the creation of a trust fund that pays a premium for electricity produced from renewables.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources
2018: 8%
2025: 20%



384.2 gCO₂/kWh

GRID EMISSION FACTOR (2015)

**% of total
electricity output**

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

605 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators, reegle



AMBITION

NDC target

Committed to not exceed net emissions of 483 million tons of carbon dioxide equivalent (tCO_{2e}) by the year 2030

Transport related target	<i>no mention</i>
Transport related measures	<i>no mention</i>

Targets at national level

Argentina has set a 5.9 MtCO_{2e} reduction target for the transport sector by 2030.

Source: NDC, Climate Action Tracker, Argentina INDCs, UNFCCC, National Transport and Climate Change Action Plan



TRADE-OFF'S

Sustainability of biofuels

There are no specific environmental or social/economic sustainability criteria for biofuels in Argentina. However, being a major exporter of biodiesel, the government of Argentina closely monitors other countries' criteria and regulations in order to avoid restrictions on its exports.

Source: USDA

Subsidies

2 Billion real 2013 USD

LEVEL OF FOSSIL FUEL
SUBSIDIES IN THE TRANS-
PORT SECTOR (2014)

No further information is available.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Law N° 27132 reactivates the passenger and cargo railways, the renewal and improvement of railway infrastructure and the incorporation of technologies and services that contribute to the modernization and efficiency of the public railway system.
✓ Measures to support low-carbon freight logistics	
National-level measures to support new mobility services	<i>No measures at national level</i>
National measures to support non-motorized transport	<i>No measures at national level</i>
✓ Road charges	Nation-wide highway toll

Energy

Energy/carbon emission standards LDV	<i>No standard</i>
Energy/carbon emission standards HDV	<i>No standard</i>
Pricing instruments	<i>No CO₂ or energy consumption based taxes</i>
Mandatory vehicle labelling	<i>No mandatory labelling</i>
Support mechanism for electric vehicles & charging infrastructure	<i>No measures at national level</i>
✓ Support for other low-carbon fuels and propulsion systems	Law 26.093 (2006) for the Regulation and Promotion of the Production and Sustainable Use of Biofuels
✓ Mandatory biofuel targets	Argentina has a mandatory share of 10% for biofuels.

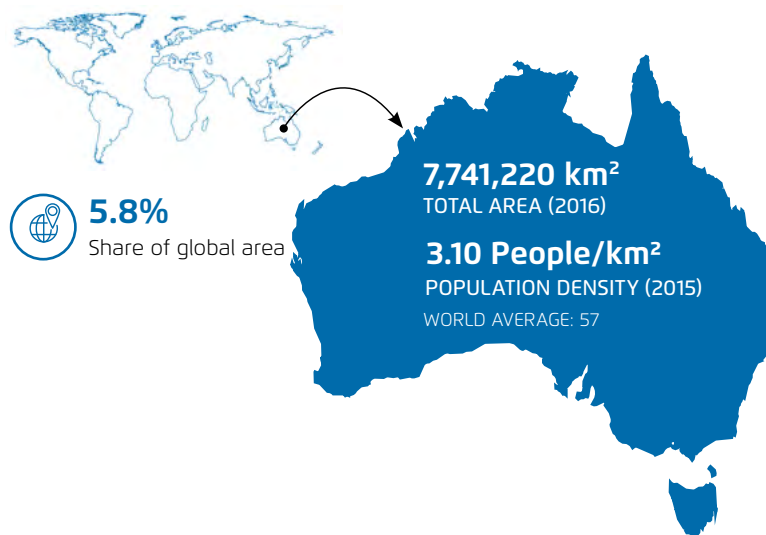
Source: See national sources Argentina

AUSTRALIA

Transport in Australia is characterised by long travel distances. The country's population is concentrated along the eastern and southeastern coastlines, leaving large swathes of the country sparsely populated. Given the size of Australia and the concentration of the population in selected areas, air travel plays a large and growing role in inter-city travel. Overall the majority of passenger travel is by road, followed by air (17%) and rail (7%). Extensive urban sprawl and low-density suburban development lead to long commuting times and heavy reliance on personal vehicle ownership. In freight, rail transport leads in terms of tonne-km travelled, but coastal freight also captures significant transport volumes.

Australia's goal of reducing emissions 26–28% below 2005 levels by 2030 does not include a specific transport sector target. Transport measures at the national level are scarce, although Australia's 40% energy productivity target for 2030 compared to 2015 includes the transport sector. Australia is one of the few G20 countries that does not yet have energy or CO₂ related emission standards for light duty vehicles.

Source: CIA World Factbook; Australian Government 2015



0.94 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



43,631 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

1,000 \$

1,000 \$



WORLD AVERAGE: 14,725



0.96%

SHARE IN GLOBAL GDP (2015)



POPULATION

23.8 mio people

POPULATION CURRENT IN 2015

0.3%

SHARE IN GLOBAL POPULATION IN 2015



URBANISATION

89.4% of total

URBAN POPULATION IN 2015

74.86%

G20 AVERAGE¹

53.86%

WORLD AVERAGE



14,027,311 people

POPULATION IN URBAN AREAS OF > 1 MIO (2015)

SHARE IN TOTAL POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

757 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE (2015)

100 Inhabitants

100 Motor Vehicles



311,876 mio passenger-km

PASSENGER TRANSPORT VOLUME* (2015)



586,497 mio tonne-km

FREIGHT TRANSPORT VOLUME** (2015)



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators

Passenger-km per mode



Road, Car: 88%
Road, Bus: 7%
Rail: 5%

Year: 2015

Tonne-km per mode



Road: 64%
Inland waterways: 0%
Rail: 36%
Pipeline: 0%

Year: 2015

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting



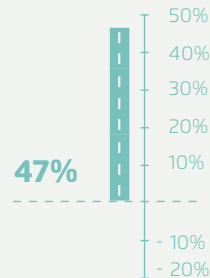
TOTAL EMISSIONS

Australia's total CO₂ emissions from fuel combustion have increased by 47% since 1990. The country has one of the highest per capita emissions globally, almost twice the G20 average and more than three times the global average. Transport sector emissions have outpaced overall growth and have increased almost 53% since 1990. While road transport plays the most important role in generating emissions from the sector, domestic aviation has been increasing in importance and now is responsible for 9.2% of transport sector emissions, the highest share in the G20. Emissions from the sector are projected to grow between 9% and 72% by 2030.

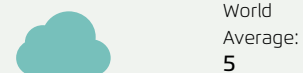
380.93 Mt CO₂



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2015)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2015)



t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990–2015)



SHARE IN GLOBAL EMISSIONS (2015)

1.18%

Sources: UNFCCC, UNDESA, IEA CO₂ emissions from fuel combustion

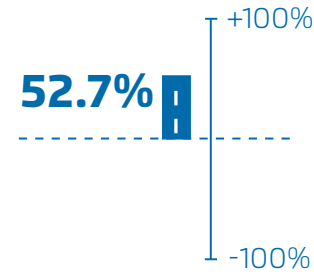


TRANSPORT SECTOR EMISSIONS

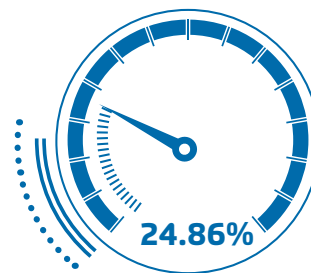
94.71 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2015)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015



G20 Average¹: 1.11

2030

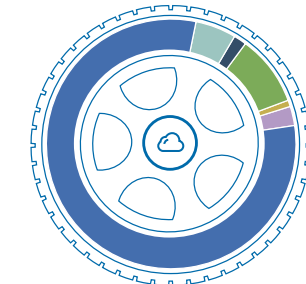


G20 Average¹: 2.33

t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

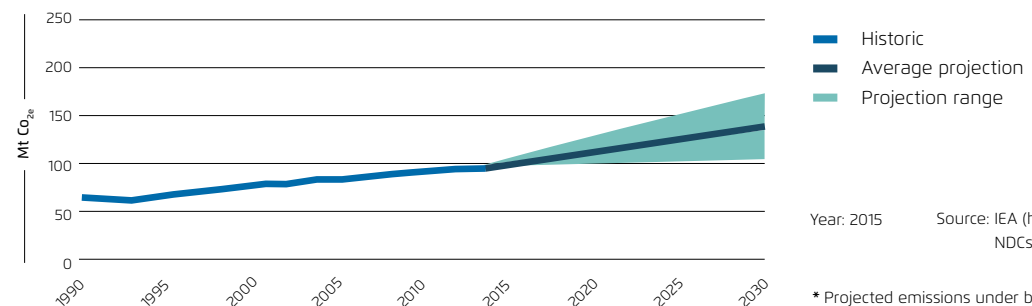
Transport emissions by subsector



Road: 80.6%
Rail: 5.4%
Domestic Navigation: 1.7%
Domestic Aviation: 9.2%
Pipeline: 0.6%
Non-specified: 2.5%

Year: 2015 Source: IEA

Historic and projected* emissions in the transport sector



Year: 2015 Source: IEA (historic), SloCaT (projections), NDCs, national sources (targets)

* Projected emissions under business-as-usual scenario

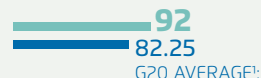


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

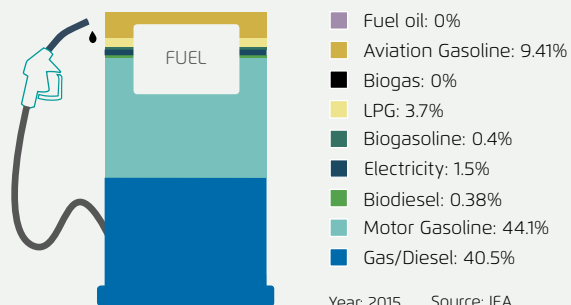


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



Year: 2015 Source: IEA

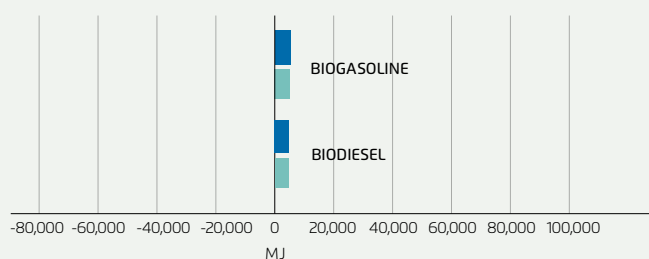
SHARE OF BIOFUELS IMPORTED (2015)

0%



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



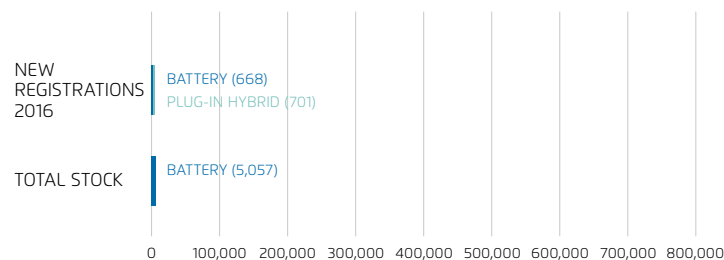
* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



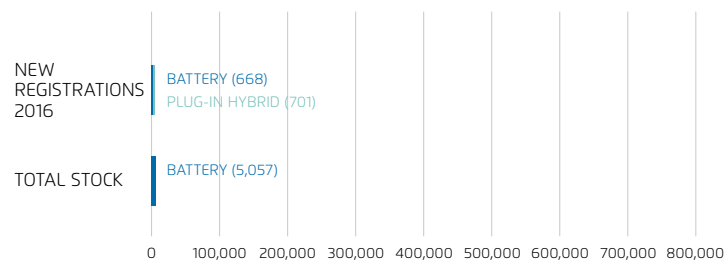
ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)



Year: 2016

NEW REGISTRATIONS OF ELECTRIC CARS (2016)



MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2016)

0.1%



SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2016)

27.1%

PUBLICLY ACCESS- SIBLE CHARGE INFRASTRUCTURE (2015)

■ 436 *
SLOW CHARGE

■ 40 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

SHARE OF ELECTRIC CARS IN TOTAL PASSENGER CAR STOCK (2016)

0.04%

Source: Electric Vehicle Council



LINKAGES TO THE ENERGY SECTOR

Coal is still the dominant fuel source for power generation in Australia, representing almost two-thirds to total generation (compared to a global average of 39%). The renewable energy target consists of two main schemes:

- the Large-scale Renewable Energy Target (LRET), which creates a financial incentive for large renewable energy power stations, and
- the Small-scale Renewable Energy Scheme (SRES), which encourages owners to install small-scale renewable energy systems such as rooftop solar, solar water heaters, heat pumps, and small-scale wind and hydro systems.

Existing targets for renewable electricity generation

The Renewable Energy Target (RET) was reviewed by the Government and reduced in June 2015 from the previously legislated 41,000 GWh to 33,000 GWh



754.8 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

14.9%

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

5,472 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

2.6%

SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators,
Clean Energy Council Australia



AMBITION

NDC target

Committed to a 26–28% reduction in GHG emissions in 2030 compared to 2005

Transport related target *No mention*

Transport related measures National Energy Productivity Target: 40% improvement between 2015–30 (including efficiency improvements in light and heavy vehicles)

Targets at national level

Australia does not have specific national targets for the transport sector

Source: NDC, The Sixth National Communication of Australia



TRADE-OFF'S

Sustainability of biofuels

There are no specific environmental or social/economic sustainability criteria for biofuels in Australia.

Source: USDA

Subsidies

2 Billion Australian USD

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Energy prices are generally deregulated in Australia. However, there are excise tax reductions for aviation fuels (which accounted for almost 80% of subsidies estimated by the OECD in 2014) and for „alternative fuels“ (LPG, natural gas).

Source: OECD



IMPLEMENTATION

Mobility

National programmes to support shift to public transport	<i>No measures at national level</i>
✓ Measures to support low-carbon freight logistics	Credit generation through mode shift under the Emission Reduction Fund
National-level measures to support new mobility services	<i>No measures at national level</i>
✓ National measures to support non-motorized transport	The Australian National Cycling Strategy 2011–16 was extended by one year and is to be replaced by a National Active Transport Strategy by 2018
Road charges	<i>No general charges at national level</i> <i>16 toll roads operational (mostly PPPs)</i>

Energy

Energy/carbon emission standards LDV	<i>Under discussion</i>
Energy/carbon emission standards HDV	<i>No standard</i>
Pricing instruments	<i>No CO₂ or energy consumption based taxes</i>
✓ Mandatory vehicle labelling	Fuel consumption labelling standard (ADR81/02)
✓ Support mechanism for electric vehicles & charging infrastructure	Discount on luxury car tax Information programmes
✓ Support for other low-carbon fuels and propulsion systems	Credit generation through reducing the emissions intensity of vehicles in the land and sea transport sectors under the Emission Reduction Fund
Mandatory biofuel targets	<i>No national requirements. However, there are state requirements in Queensland (E3 by July 2017, E4 by July 2018 and B0.5) and New South Wales (E6/B2)</i>

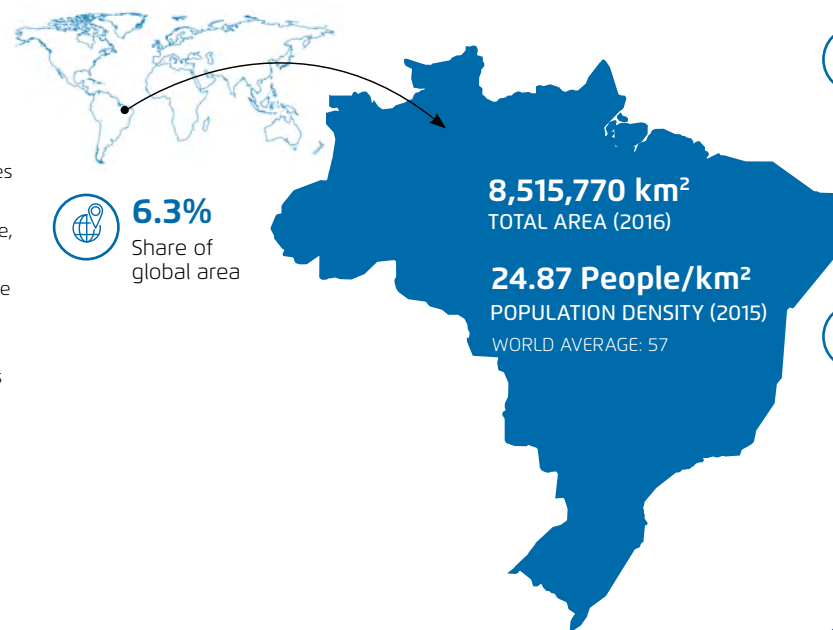
Source: See national sources Australia

BRASIL

Brazil is characterised by long travel distances, with most urban centres lying along its 7,500 km coastline. Inland areas, including the Amazon rainforest, are sparsely populated. Air transport plays an important role, with 4,000 airports in operation, the second largest number globally. While Brazil has a large highway network, it is relatively small given the country's size. The railway system however is rather fragmented with a regional focus in the São Paulo region. Rail is mostly used for freight transport, with a few exceptions on tourist routes. Although Brazil has an extensive network of navigable rivers, just 14% of cargo is transported using inland navigation.

The national target of reducing transport sector emissions by 48–60 Mt CO₂ by 2020 could see sector emissions return to 2011 levels. Although Brazil has enacted a range of other measures, particularly in the area of biofuels, there are still significant gaps in the promotion of new modes of transport and energy efficient technologies.

Source: U.S. Department of Commerce; CIA World Factbook



Sources: World Development Indicators



0.75 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



14,533 constant 2011 international \$ (PPP)

GDP PER CAPITA (2015)

1,000 \$



2.79%

SHARE IN GLOBAL GDP (2015)



POPULATION

207.8 mio people

POPULATION CURRENT IN 2015

2.8%

SHARE IN GLOBAL POPULATION IN 2015



URBANISATION

85.7% of total

URBAN POPULATION IN 2015

74.86%

G20 AVERAGE¹

53.86%

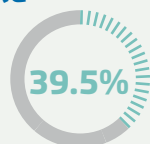
WORLD AVERAGE



82,193,463 people

POPULATION IN URBAN AREAS OF > 1 MIO (2015)

SHARE IN TOTAL POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

162 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE (2014)

1 = 100 Inhabitants
1 = 100 Motor Vehicles



No data (passenger-km)

PASSENGER TRANSPORT VOLUME*



No data (tonne-km)

FREIGHT TRANSPORT VOLUME**



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF Outlook 2017

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

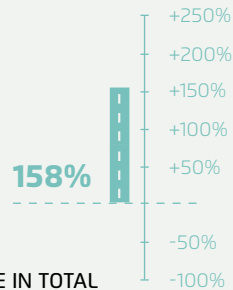


TOTAL EMISSIONS

Brazil's total CO₂ emissions from fuel combustion have increased by 158% since 1990, with the transport sector growing at almost the same rate. Per capita emissions are, nevertheless, still far below the G20 and world average. The transport sector is responsible for 45% of total emissions, the largest share within the G20. This high share is attributable to the extremely large percentage of electricity generation from renewables (73%). Road transport is responsible for 90% of the emissions within the transport sector, followed by domestic aviation with 5%.

476.02 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2014)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2014)

2.29

G20 Average¹: 8.4

World Average: 5

t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990-2014)



SHARE IN GLOBAL EMISSIONS (2014)

1.47%

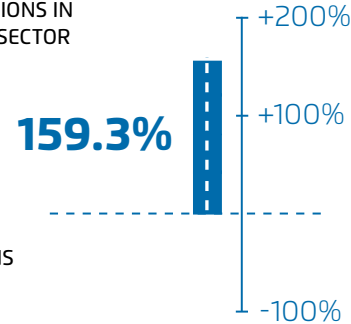
Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion



TRANSPORT SECTOR EMISSIONS

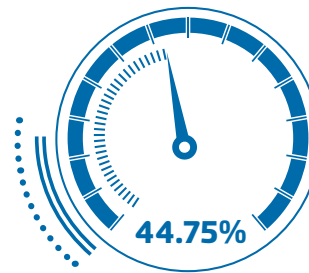
213.03 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2014)



CHANGE IN TRANSPORT SECTOR EMISSIONS (1990-2014)

SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015

1.02

G20 Average¹: 1.11

2030

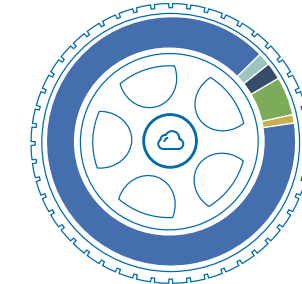
1.51

G20 Average¹: 2.33

t CO₂ per capita

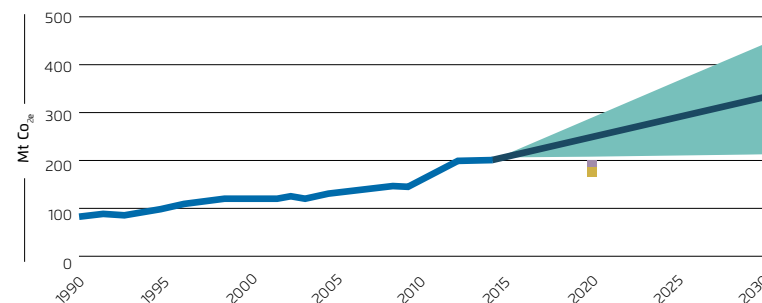
Sources: IEA, UNDESA, SloCaT

Transport emissions by subsector



Year: 2014 Source: IEA

Historic and projected* emissions in the transport sector



Historic
Average projection
Projection range
National target 2030 high value
National target 2030 low value

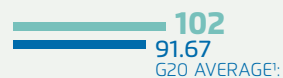
Year: 2015 Source: IEA (historic), SloCaT (projections), NDCs, national sources (targets)

* Projected emissions under business-as-usual scenario

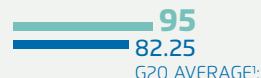


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

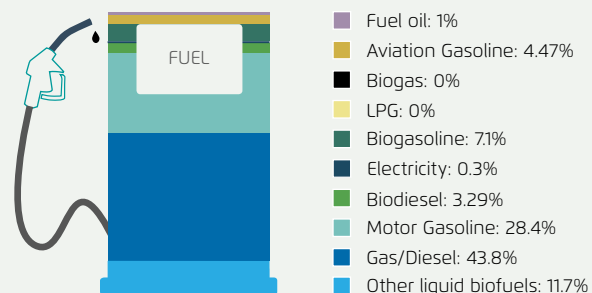


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



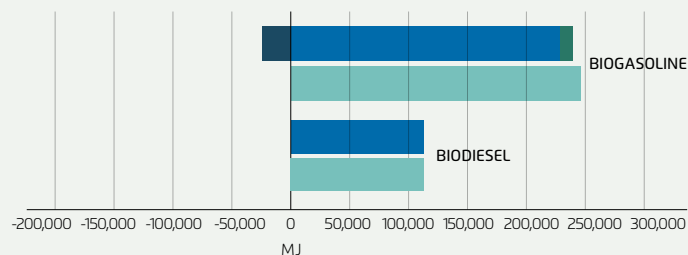
Year: 2015 Source: IEA

SHARE OF BIOFUELS IMPORTED (2015)



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



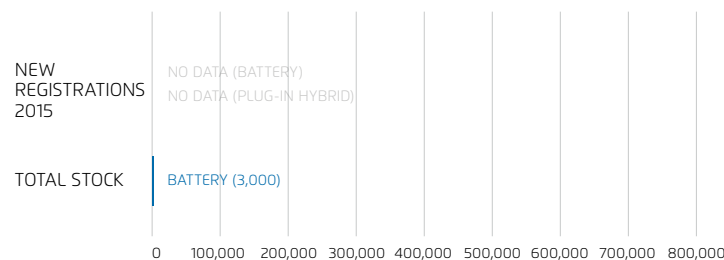
* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2015)



Year: 2016

NEW REGISTRATIONS OF ELECTRIC CARS (2015)

NO DATA (MARKET
SHARE OF ELECTRIC
CARS IN THE NATION-
AL MARKET)

%

NO DATA (SHARE OF
NEW REGISTRATIONS
IN TOTAL EV STOCK)

%

NO DATA (SHARE OF
ELECTRIC CARS IN
TOTAL PASSENGER
CAR STOCK)

%

PUBLICLY ACCE-
SSIBLE CHARGE
INFRASTRUCTURE
(2015)

■ 50 *
SLOW CHARGE

■ No Data
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: BMW Green Transportation Working Paper



LINKAGES TO THE ENERGY SECTOR

Brazil already has a high share of renewable electricity generation due to abundant hydropower, and most fossil fuel-based generation relies on natural gas. Since 2002 the PROFINA programme has encouraged renewable energy development by providing for 20-year power purchase agreements (PPAs) with the state-owned utility company Eletrobrás. Since 2005, concessions have been awarded using an auction model. Wind power sales and component imports are exempt from certain taxes and levies.

Since 2013, the Inova programme has been providing subsidies and other incentives to assist Brazilian companies and technology institutes to develop and commercialize innovative technologies for the power sector, including solar power, smart grids and energy-efficient vehicles.

Existing targets for renewable electricity generation

Share of electricity generation from renewable
sources (excluding all hydro)
2030: 23%

156.6 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

73.1%
SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

2,768 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

0.6%
SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators,
3rd National Communication; reegle



AMBITION

NDC target

Committed to a 37% reduction in GHG emissions in 2025, and a 43% reduction in GHG emissions in 2030 compared to 2005

Transport related target

By 2030 Brazil aims to increase the share of sustainable biofuels to approximately 18%

Transport related measures

Promote Energy Efficiency Measures
Improve Infrastructure
Improve Public Transport in Urban Area

Targets at national level

Brazil has set a 48–60 MtCO_{2e} reduction target for the transport sector by 2020 through increased use of biofuels.

Source: NDC, National Climate Change Plan (PNMC) 2008



TRADE-OFF'S

Sustainability of biofuels

There are no environmental sustainability criteria in Brazil's biofuel mandates. Greenhouse gas emission reduction levels are not considered, nor is indirect change in land use.

Source: TransportPolicy.net

Subsidies

57 Billion Brazilian reals

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Prices for natural gas and for petroleum products in Brazil were officially deregulated in January 2002 with the elimination of formal price controls. Oil and gas producers benefit from special tax incentives for infrastructure development as well as a special tax regime for equipment used in the exploration and development of hydrocarbon resources. There are also preferential loans to companies along the oil and gas supply chain.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	National Urban Mobility Policy (PNMU) Big Cities Mobility: upgrading public transportation systems Mobility law (2012) Sectoral Plan on Transportation and Urban Mobility for the Mitigation of Climate Change (PSTM)
✓ Measures to support low-carbon freight logistics	Despoluir: Programa Ambiental do Transporte
National-level measures to support new mobility services	<i>No measures at national level</i>
National measures to support non-motorized transport	<i>National Urban Mobility Policy (PNMU) Mobility law (2012)</i>
Road charges	<i>No general charges at national level The Urban Mobility Law (2012) authorizes municipalities to implement congestion pricing to reduce traffic flows</i>

Energy

✓ Energy/carbon emission standards LDV	Fuel efficiency target 2017: 1.82 MJ/km
Energy/carbon emission standards HDV	<i>No standard</i>
Pricing instruments	<i>No CO₂ or energy consumption based taxes</i>
Mandatory vehicle labelling	<i>Brazilian Vehicle Labeling Program (PBEV) voluntary labelling</i>
✓ Support mechanism for electric vehicles & charging infrastructure	Import tax exemption for EVs and for hybrid vehicles
✓ Support for other low-carbon fuels and propulsion systems	Proálcool programme: Gas stations obliged to sell ethanol, ethanol price lower than gasoline's, guaranteed remuneration of the producer; Reduction of taxes for vehicles using hydrous ethanol
✓ Mandatory biofuel targets	Brazil has a mandatory share of 27% for bioethanol and in 2017 introduced a mandatory share of 8% for biodiesel, increased from its previous level of 5%. This is scheduled to further increase to 9% in 2018 and 10% in 2019.

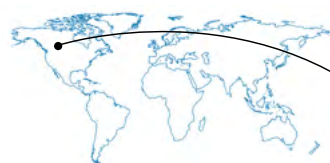
Source: See national sources Brazil

CANADA

Canada is the second largest country in the world by area. The vast majority of Canadians live within 300 km of the US border. The country features large forests and extensive areas covered by continuous permafrost. Despite having the world's fourth largest rail system, passengers are mainly transported by road and increasingly by air. With 35,000 civilian aircraft, Canada has the second largest civilian air fleet in the world. Nevertheless, railways are important for freight transport, and are interconnected with the US rail system. The Great Lakes are an important water route, both domestically and for freight transport to the US.

Canada has no specific targets for the transport sector. The Pan-Canadian Framework on Clean Growth and Climate Change, adopted at the end of 2016, aims to implement measures to further strengthen efficiency, low-carbon technology and a modal shift, including the introduction of carbon pricing by 2018.

Source: 6th National Communication; CIA World Factbook; The Canadian Encyclopedia



7.4%
Share of global area

9,984,670 km²
TOTAL AREA (2016)
3.94 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



0.92 HDI*
HUMAN DEVELOPMENT INDEX* IN 2015



WORLD AVERAGE: 0.72

Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



42,983 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

1,000 \$



G20 AVERAGE: 18,379



WORLD AVERAGE: 14,725



1.42%
SHARE IN GLOBAL GDP (2015)



POPULATION

35.8 mio people

POPULATION CURRENT IN 2015

0.5%

SHARE IN GLOBAL POPULATION IN 2015



URBANISATION

81.8% of total

URBAN POPULATION IN 2015

74.86%

G20 AVERAGE¹

53.86%

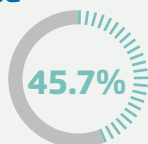
WORLD AVERAGE



16,393,641 people

POPULATION IN URBAN AREAS OF > 1 MIO (2015)

SHARE IN TOTAL POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

662 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE (2014)

1 = 100 Inhabitants

1 = 100 Motor Vehicles



509,992 mio passenger-km

PASSENGER TRANSPORT VOLUME* (2016)



665,066 mio tonne-km

FREIGHT TRANSPORT VOLUME** (2014)



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators, Transportation in Canada 2016

Passenger-km per mode



Year: 2016

Tonne-km per mode



Year: 2014

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

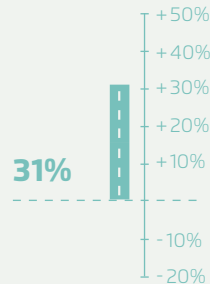


TOTAL EMISSIONS

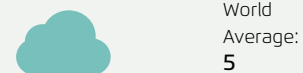
Canada's total CO₂ emissions from fuel combustion have increased by 31% since 1990, with transport sector emissions increasing by 39% over the same period. Transport sector emissions represent almost a third of total emissions, due to the high share of renewable electricity generation. Per capita emissions are among the highest globally, three times as high as the global average. Canada has an unusually high share of emissions from pipeline transport, which is the third largest contributor at 5%, after road transport and aviation.

549.23 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2015)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2015)



t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990–2015)



SHARE IN GLOBAL EMISSIONS (2015)

1.70%

Sources: UNDESA, IEA CO₂ emissions from fuel combustion

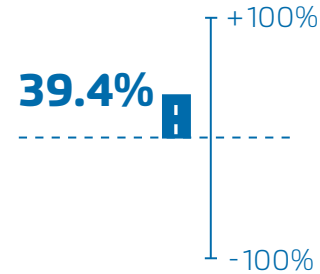


TRANSPORT SECTOR EMISSIONS

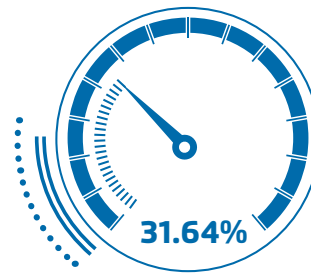
173.80 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2015)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015



G20 Average¹: 1.11

2030

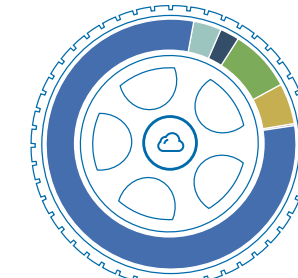


G20 Average¹: 2.33

t CO₂ per capita

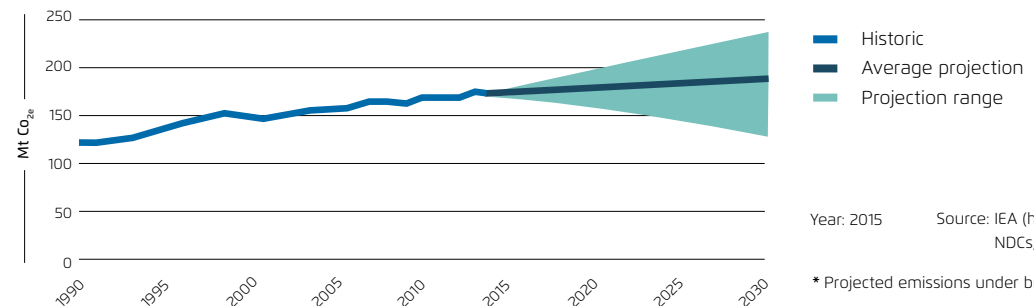
Sources: IEA, UNDESA, SloCaT

Transport emissions by subsector



Year: 2015 Source: IEA

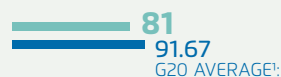
Historic and projected* emissions in the transport sector





ENERGY

US Cents/Litre GASOLINE PRICE (2016)

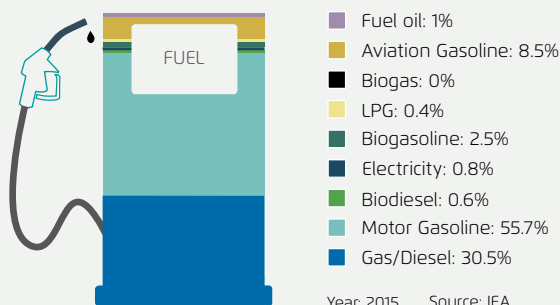


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel

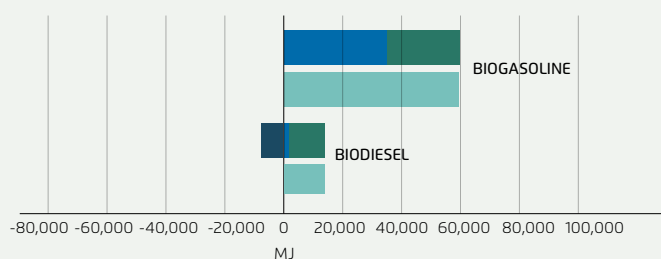


SHARE OF BIOFUELS IMPORTED (2015)



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



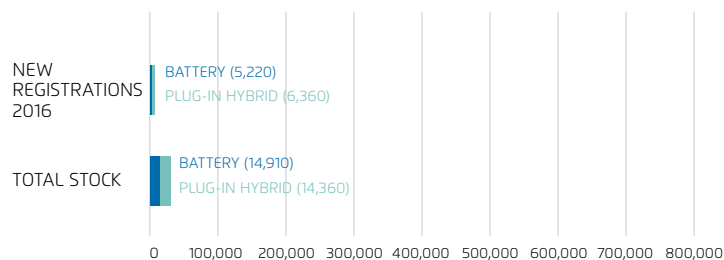
* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)



Year: 2016

NEW REGISTRATIONS OF ELECTRIC CARS (2016)

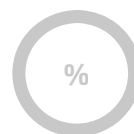
MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2016)

0.59%

SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2016)



NO DATA (SHARE OF ELECTRIC CARS IN TOTAL PASSENGER CAR STOCK)



PUBLICLY ACCESSIBLE CHARGE INFRASTRUCTURE (2016)

■ 3,900 *
SLOW CHARGE

■ 315 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: IEA EV Outlook 2017



LINKAGES TO THE ENERGY SECTOR

Canada already has a high share of renewable electricity generation due to abundant hydropower. Some 15% of power is generated using nuclear energy. Canada currently does not have an incentive scheme for renewable electricity generation at the national level. The ecoENERGY Innovation Initiative ended in 2011. There are a range of different support schemes operational at the provincial level.

Existing targets for renewable electricity generation

No national target, provincial targets in Ontario and Prince Edward Island

151.2 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

62.8%
SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

5,157 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

1.0%
SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators



AMBITION

NDC target

Committed to a 30% reduction in GHG emissions in 2030 compared to 2005

Transport related target

no mention

Transport related measures

Carbon price from 2018
Develop a clean fuel standard
Set increasingly stringent standards for LDV and HDV
Develop zero-emission strategy
Support fuel switching in the rail, aviation, marine, and off-road sectors
Invest in public transit and other infrastructure to support shifts from higher- to lower-emitting modes

Targets at national level

No transport specific national target

Source: NDC, Canada's Mid-Century Long-Term Low-Greenhouse Gas Development Strategy 2016



TRADE-OFF'S

Sustainability of biofuels

Canada has defined a set of non-mandatory principles for sustainable biofuels.

Source: OECD

Subsidies

1 Billion Canadian USD

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Several measures supporting the production and consumption of fossil fuels remain in place in Canada as of 2015, though total support has declined since 2008. Several provinces continue, however, to provide support for the extraction sector through targeted royalty concessions and R&D spending and there are provincial measures that subsidise transport fuels through tax concessions.

Source: OECD



IMPLEMENTATION

Mobility

National programmes to support shift to public transport	<i>No measures at national level</i>
✓ Measures to support low-carbon freight logistics	SmartWay Initiative (in coordination with the U.S.) FleetSmart programme ecoMOBILITY Program ecoTECHNOLOGY for Vehicles Program ecoFREIGHT Program
National-level measures to support new mobility services	<i>No measures at national level</i>
National measures to support non-motorized transport	<i>No measures at national level</i>
Road charges	<i>No general charges at national level</i> <i>Two toll highways and a number of toll bridges based on provincial initiatives</i>

Energy

✓ Energy/carbon emission standards LDV	Canada follows the U.S. standards in the proposal, but the final target value will be based on the projected fleet footprints
✓ Energy/carbon emission standards HDV	Phase 1
✓ Pricing instruments	Excise tax on high CO ₂ vehicles Nationwide carbon price under development
✓ Mandatory vehicle labelling	EnerGuide Label for Vehicles
Support mechanism for electric vehicles & charging infrastructure	<i>Only at provincial level</i>
✓ Support for other low-carbon fuels and propulsion systems	Renovabio programme ecoEnergy for Biofuels program
✓ Mandatory biofuel targets	Canada has a mandatory share of 5% for bioethanol and 2% for biodiesel. At the state level some requirements go beyond this (British Columbia: B4; Manitoba: E8.5; Ontario: B4; Saskatchewan: E7.5).

Source: See national sources Canada

CHINA

China is the world's most populous country and 4th largest by area. The overwhelming majority of the population lives in the eastern half of the country; the vast mountain and desert areas of the west are sparsely populated. Accordingly, transport infrastructure is most developed along the eastern seaboard. China has the second largest railway network globally, and rail plays an important role for both passenger and freight transport, although the majority of freight is carried by road. China has been rapidly motorising, moving from only 16 private cars per 1000 inhabitants in 2005 to 83 private cars per 1000 inhabitants in 2014. This has led to substantial congestion and pollution problems in urban areas. A similar growth can be seen in freight, where total cargo transport increased from 18.62 Gt in 2005 to 32.42 Gt in 2010, of which road transport accounted for 75%.

China has set a 60–65% carbon intensity improvement target, as well as a 30% public transport target for urban centres by 2020. These goals are backed by a limited number of measures at the national level. However, China has a wide range of policies in place to support energy-efficient and low-carbon vehicles.

Source: ITF 2011; CIA World Factbook



9,562,911 km²
TOTAL AREA (2016)

146.06 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



0.74 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



13,572 constant 2011 international \$ (PPP)

GDP PER CAPITA (2015)

1,000 \$



G20
AVERAGE:
18,379



WORLD
AVERAGE:
14,725



17.20%

SHARE IN GLOBAL GDP (2015)



POPULATION

1,371.2 mio people

POPULATION CURRENT
IN 2015

18.7%

SHARE IN GLOBAL
POPULATION IN 2015



URBANISATION

55.6% of total

URBAN POPULATION
IN 2015

74.86%

G20 AVERAGE¹

53.86%

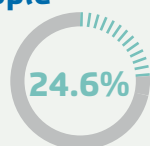
WORLD AVERAGE



336,966,377 people

POPULATION IN URBAN
AREAS OF > 1 MIO (2015)

SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

**83 Road motor
vehicles per 1,000
inhabitants**

MOTORISATION RATE
(2014)

100 Inhabitants

100 Motor Vehicles



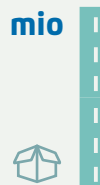
**2,368,890 mio
passenger-km**

PASSENGER TRANSPORT
VOLUME* (2014)



**12,989,262.581 mio
tonne-km**

FREIGHT TRANSPORT
VOLUME** (2014)



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF Outlook 2017, ITF/OECD, World Development Indicators

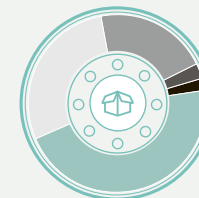
Passenger-km per mode



■ Road, Car: 51%
■ Road, Bus: 0%
■ Rail: 49%

Year: 2014

Tonne-km per mode



■ Road: 47%
■ Inland waterways: 29%
■ Rail: 21%
■ Pipeline: 3%
■ Domestic Air: 0%

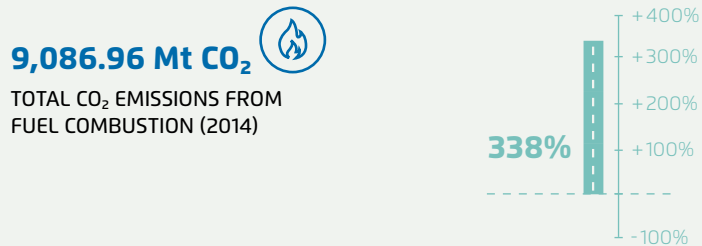
Year: 2014

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

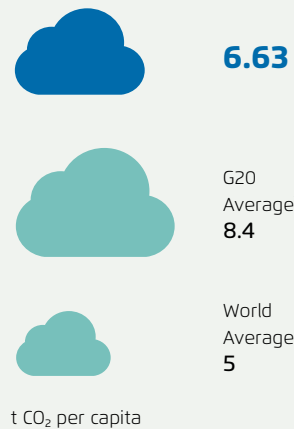


TOTAL EMISSIONS

China's total CO₂ emissions from fuel combustion have more than tripled since 1990, making it the largest global emitter by far. Transport sector emissions have grown by 680% over the same period due to rapid motorisation and greatly increased transport activity. Nevertheless, the sector only represents a little under 9% of total national emissions, the lowest share within the G20, mainly due to the high levels of coal use in electricity generation and industry. Emissions in the transport sector are projected to potentially more than double by 2030 compared to 2014 levels. China is the only country with notable electricity-related emissions from road transport. This is due to the massive surge of electric vehicles in many cities, combined with the high carbon intensity of electricity generation.



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2014)



28.06%

SHARE IN GLOBAL EMISSIONS (2014)

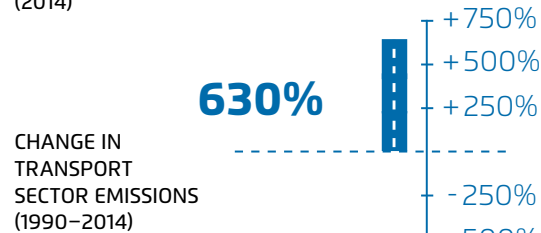
Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion



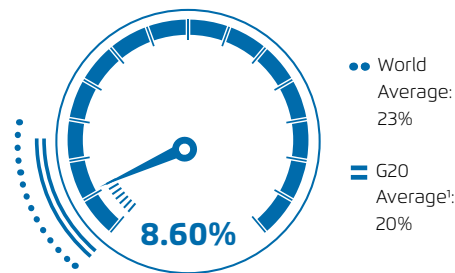
TRANSPORT SECTOR EMISSIONS

781.36 Mt CO₂

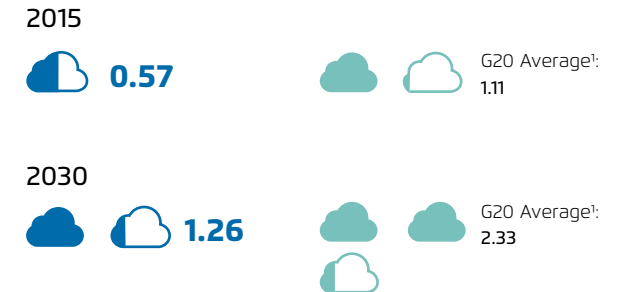
TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2014)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2014)

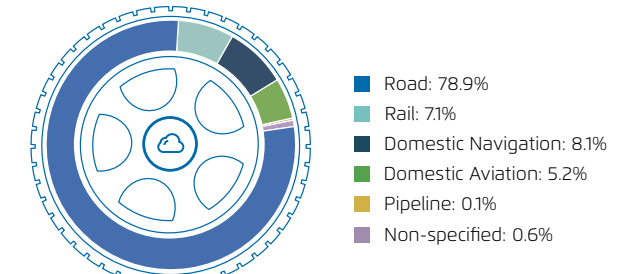


TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2014/2030)



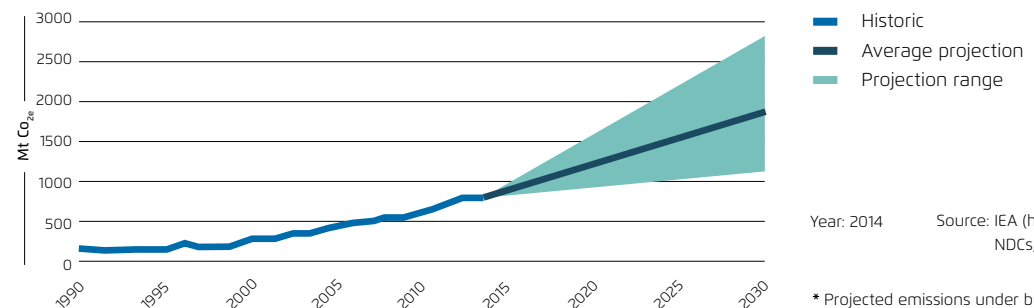
Sources: IEA, UNDESA, SloCaT

Transport emissions by subsector



Year: 2014 Source: IEA

Historic and projected* emissions in the transport sector

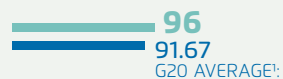


* Projected emissions under business-as-usual scenario

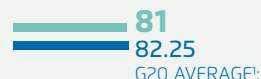


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

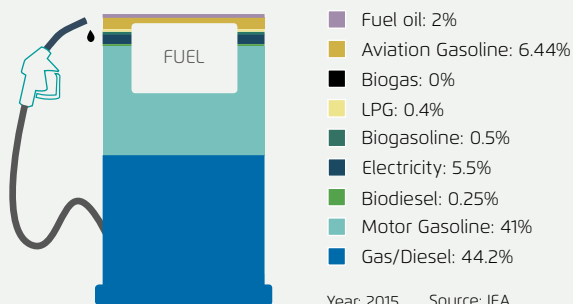


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



Year: 2015 Source: IEA

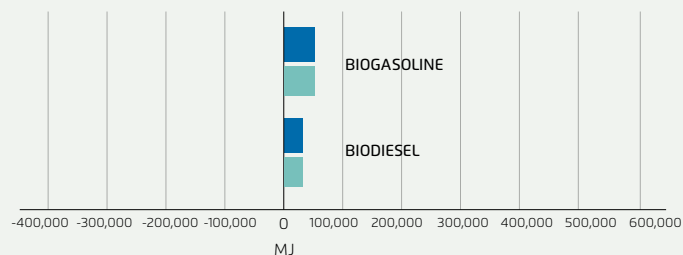
SHARE OF BIOFUELS IMPORTED (2015)

0%



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



* Excluding biogas, as this is mostly used in other sectors

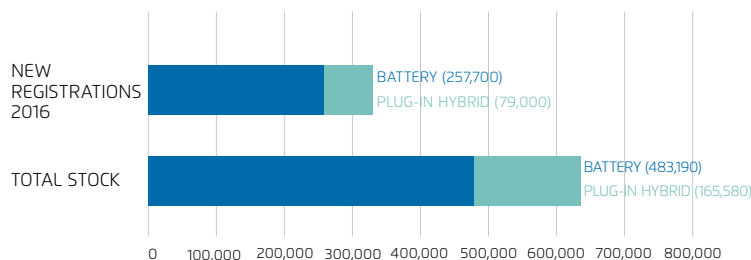
Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)

NEW REGISTRATIONS OF ELECTRIC CARS (2016)



Year: 2016

MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2016)

1.37%

SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2016)

51.8%

PUBLICLY ACCESSIBLE CHARGE INFRASTRUCTURE (2015)

■ 52,778 *
SLOW CHARGE

■ 88,476 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

NO DATA (SHARE OF ELECTRIC CARS IN TOTAL PASSENGER CAR STOCK)

%

Source: IEA EV Outlook 2017



LINKAGES TO THE ENERGY SECTOR

Coal is still the dominant fuel source for power generation in China, representing 70% of total generation (global average: 39%). In 2016, China launched a series of 5-year plans for RES, which set 2020 targets for individual technologies. The renewable power purchase guidelines for wind and solar, also published in 2016, mandate grid enterprises to buy renewable power at a nationally determined benchmark price. To promote PV industry sustainability, the National Energy Administration introduced a new mechanism for managing the scale of PV projects and for competitive bidding.

Existing targets for renewable electricity generation

680 GW non-fossil fuel generation capacity by 2020



656.7 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

179,638 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators



AMBITION

NDC target

Committed to lower carbon dioxide emissions per unit of GDP by 60–65% in 2030 compared to 2005

Transport related target

Promote the share of public transport in motorised travel in large- and medium-sized cities (30% share by 2020)

Transport related measures

Improve the quality of gasoline and promote new types of alternative fuels and new energy vehicles and vessels
Develop dedicated transport system for pedestrians and bicycles in cities and advocate green travel
Develop smart transport and green freight transport

Targets at national level

30% Public transport share in large and medium-sized cities
5% CO₂ emissions reduction per road revenue passenger kilometer
13% CO₂ emissions reduction per road freight tonne kilometer
15% CO₂ emissions reduction per unit of railway traffic volume
13% CO₂ emissions reduction per unit of waterway traffic volume
11% CO₂ emissions reduction per unit of civil aviation traffic volume
4.8 million electric vehicle charging points are to be built by 2020

Source: NDC



TRADE-OFF'S

Sustainability of biofuels

China promotes the development of ethanol production using non-food grain feedstocks. Policies and defined subsidy benefits have historically discouraged ethanol production using corn, wheat, and rice feedstocks. State policies prescribed that biofuel development (including fuel ethanol and biodiesel) should not compete for arable land with crops designated for human consumption.

Source: USDA

Subsidies

208 Billion yuan renminbi

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Prices of fossil fuels in China are regulated by national, regional, and local authorities. Subsidies for fossil fuels in China mainly come in the form of direct payments under the petroleum price-reform support programmes. Taxi drivers, public transport and fuel users in farming, forestry and fisheries have been the largest beneficiaries of the measure. Since 2009, aviation fuel for domestic flights is exempt from excise tax.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Transit Metropolis Programme 2011: encourages and supports cities in improving their public transport systems, inter-modal integration and transit-oriented developments.
✓ Measures to support low-carbon freight logistics	Pilot projects for logistics hubs
National-level measures to support new mobility services	<i>No direct support measures. Guidelines for bike-sharing and car-rental/car-sharing foresee development of measures and high flexibility to test new mobility concepts.</i>
National measures to support non-motorized transport	<i>No measures</i>
✓ Road charges	Charges for all types of vehicles on highways

Energy

✓ Energy/carbon emission standards LDV	Phase IV fuel efficiency target for 2020: 5l/100km Fuel efficiency standards for 2- and 3-wheelers
✓ Energy/carbon emission standards HDV	Phase 2
Pricing instruments	<i>No measures at national level</i>
✓ Mandatory vehicle labelling	Fuel economy labeling for vehicles under 3500 kg
✓ Support mechanism for electric vehicles & charging infrastructure	Government subsidies for public charging infrastructure Acquisition tax and excise tax exemption, circulation and ownership tax exemption Possibility of local subsidies within the limit of 50% of the amount granted via central subsidies From 2019: 'new energy vehicle score' under the ETS
✓ Support for other low-carbon fuels and propulsion systems	Subsidies for the purchase of energy-efficient vehicles (based on fuel consumption) U.S.-China Race to Zero Emissions (R2ZE) challenge (buses and heavy duty vehicles) Biofuels for air transport approved for usage From 2019: 'new energy vehicle score' under the ETS
Mandatory biofuel targets	<i>China does not have a national requirement for biofuels. However, the National Climate Change Plan (2014) sets a target of 130 billion cubic meters of biofuel consumption by 2020. A mandatory share of 10% for bioethanol applies in 9 provinces and a share of 1% for biodiesel in Taipei.</i>

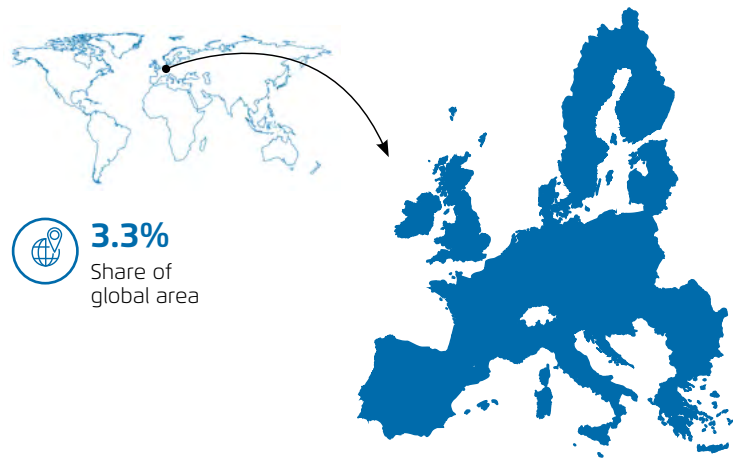
Source: See national sources China

EU

The EU comprises 28 member states on the European continent, each of which have divergent transport systems and challenges. Most EU member states have relatively high population densities, although there are numerous regions with low densities (e.g. in Sweden, Finland or the centre of Spain). Air transport has been growing in importance for passenger travel, particularly since the rise of budget airlines. Nevertheless, road transport remains the most important travel mode for passengers and to a lesser extent for freight. Approximately one-third of goods are transported by water.

The EU does not have specific emission targets for the transport sector, but does have a 10% renewables target. Many measures related to the efficiency of vehicles are governed by EU legislation, including CO₂ emission standards for passenger cars and light duty vehicles, and mandatory labeling requirements. The EU has limited measures to support a modal shift, and mainly uses guidelines and infrastructure funds to support member states in the area of climate policy.

Source: 6th National Communication



3.3%
Share of global area

4,383,564 km²
TOTAL AREA (2016)

120.23 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



No Data (HDI*)
HUMAN DEVELOPMENT INDEX* IN 2015



WORLD AVERAGE: 0.72

Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators

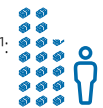


35,630 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

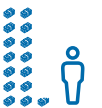
1,000 \$



G20 AVERAGE: 18,379



WORLD AVERAGE: 14,725



16.78%
SHARE IN GLOBAL GDP (2015)



POPULATION

509.6 mio people
POPULATION CURRENT IN 2015

6.9%
SHARE IN GLOBAL POPULATION IN 2015

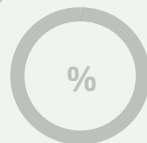


URBANISATION

74.8% of total
URBAN POPULATION IN 2015
74.86%
G20 AVERAGE¹
53.86%
WORLD AVERAGE



No Data (people)
POPULATION IN URBAN AREAS OF > 1 MIO (2015)
NO DATA (SHARE IN TOTAL POPULATION 2015)



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

573 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE (2015)

100 Inhabitants
100 Motor Vehicles



5,099,285 mio passenger-km

PASSENGER TRANSPORT VOLUME* (2015)



2,347,720 mio tonne-km

FREIGHT TRANSPORT VOLUME** (2015)



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ACEA, Eurostat

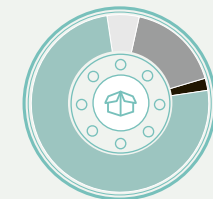
Passenger-km per mode



Road, Car: 83%
Road, Bus: 9%
Rail: 8%

Year: 2015

Tonne-km per mode



Road: 75%
Inland waterways: 6%
Rail: 17%
Pipeline: 0%
Domestic Air: 2%

Year: 2015

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

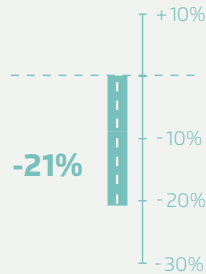


TOTAL EMISSIONS

Total CO₂ emissions from fuel combustion in the European Union have decreased by 24% since 1990. Transport sector emissions during the same period have increased by almost 16%, and could grow up to 66% by 2030. Road transport is responsible for 93% of transport sector emissions, with rail generating 2.5% of emissions.

3,160.02 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2014)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2014)



6.20



G20 Average¹:
8.4



t CO₂ per capita

World Average:
5



SHARE IN GLOBAL EMISSIONS (2014)

9.76%



Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

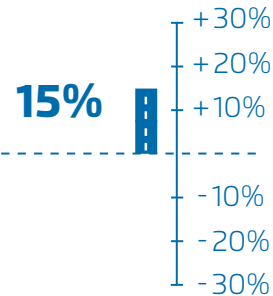


TRANSPORT SECTOR EMISSIONS

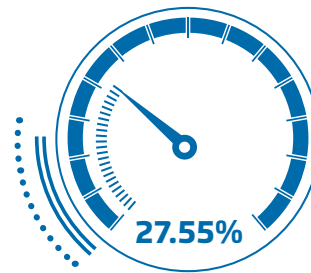
870.62 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2014)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2014)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2014)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2014/2030)



2015

1.71

G20 Average¹:
1.11

2030

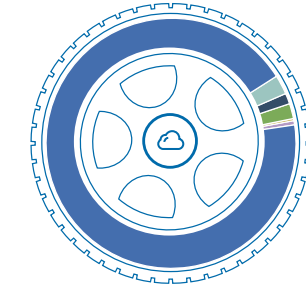
2.23

G20 Average¹:
2.33

t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

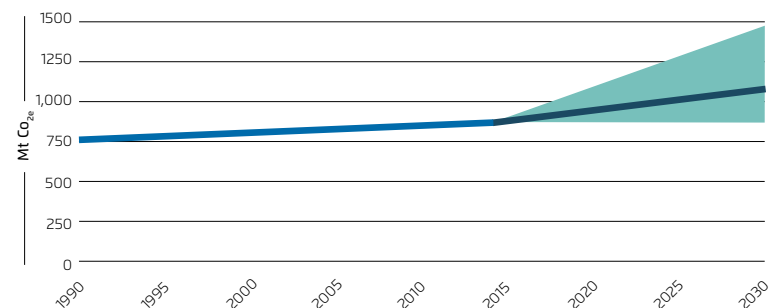
Transport emissions by subsector



Road: 93.4%
Rail: 2.5%
Domestic Navigation: 1.5%
Domestic Aviation: 1.8%
Pipeline: 0.4%
Non-specified: 0.4%

Year: 2014 Source: IEA

Historic and projected* emissions in the transport sector



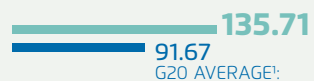
Year: 2014 Source: IEA (historic), SloCaT (projections), NDCs, national sources (targets)

* Projected emissions under business-as-usual scenario

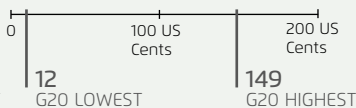


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

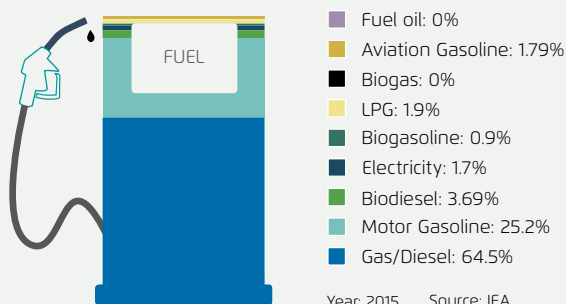


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



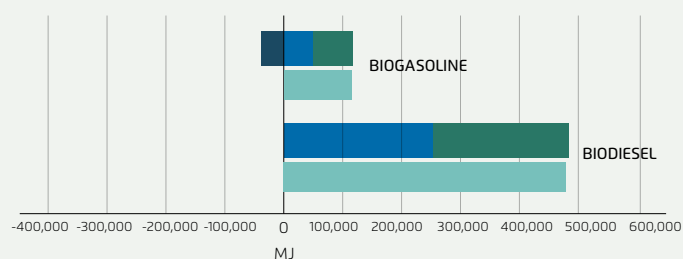
Year: 2015 Source: IEA

SHARE OF BIOFUELS IMPORTED (2015)



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



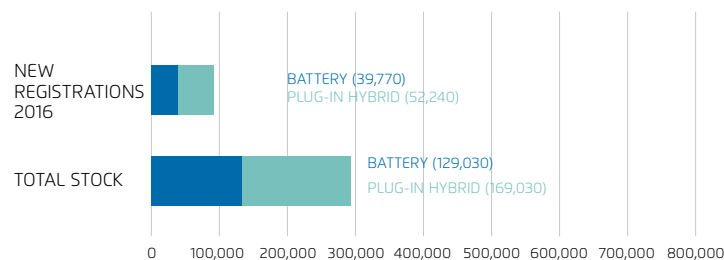
* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



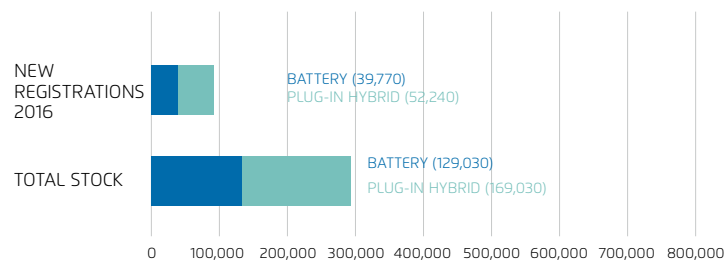
ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)



Year: 2016

NEW REGISTRATIONS OF ELECTRIC CARS (2016)



MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2016)

2.99%

SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2016)

23.6%

SHARE OF ELECTRIC CARS IN TOTAL PAS- SENGER CAR STOCK (2016)

0.16%

PUBLICLY ACCE- SSIBLE CHARGE INFRASTRUCTURE (2015)

■ 70,201 *
SLOW CHARGE

■ 5,381 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: IEA EV Outlook



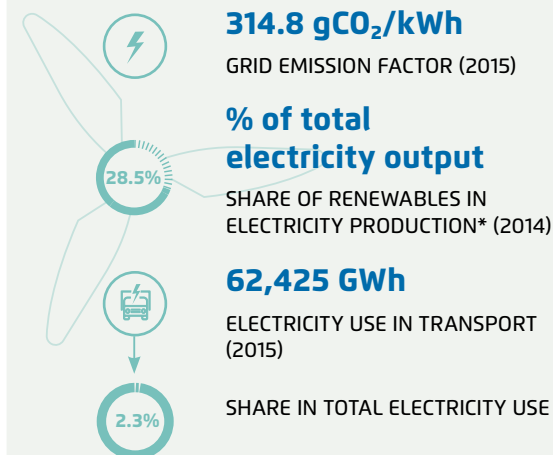
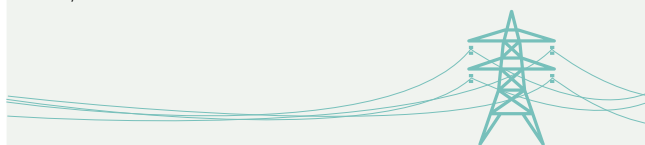
LINKAGES TO THE ENERGY SECTOR

The EU has set renewable energy targets and requires member states to define action plans for meeting their obligations. It does not have any EU-wide support mechanisms, but has issued guidance for the design of support schemes.

Existing targets for renewable electricity generation

No specific target for renewable electricity generation.

This is included in the overall renewable energy target of 20% renewable energy in gross final energy consumption by 2020.



* Including hydropower

Sources: IEA, World Development Indicators, European Commission



AMBITION

NDC target

Committed to at least 40% reduction in GHG emissions in 2030 compared to 1990

Transport related target *No mention*

Transport related measures *No mention*

Targets at national level

The EU does not have a specific emission target for the transport sector at the EU level, but the Renewable Energy Directive sets the following targets:

- Minimum 10% share of renewables in final energy consumption of the transportation sector by 2020
- Biofuels and bio-liquids should contribute to a reduction of at least 35% of GHG emissions in order to be recognised. On 1 January 2017, this emissions savings requirement was increased to 50%.

Source: NDC, Grantham Research Institute



TRADE-OFF'S

Sustainability of biofuels

The EU Renewable Energy Directive establishes two sets of criteria to promote the sustainability of biofuels production:

- GHG emissions savings and land use requirements must be at least 50% (60% for new installations in 2018), and (2) biodiesel may not be produced on land that was converted from high carbon density conditions such as rainforests.
- To demonstrate compliance with the EU sustainability criteria, biofuels need to be validated by national verification systems or by one of 20 voluntary schemes approved by the EC.

Source: European Commission

Subsidies

No Data

LEVEL OF FOSSIL FUEL
SUBSIDIES IN THE TRANS-
PORT SECTOR (2014)

The EU does not provide direct subsidies for fossil transport fuels. Subsidies in the sector are defined at the members state level.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Connecting Europe Facility (CEF) for Transport Action Plan on Urban Mobility
✓ Measures to support low-carbon freight logistics	Connecting Europe Facility (CEF) for Transport European Rail Network for Competitive Freight (Regulation EU 913/2010)
National-level measures to support new mobility services	<i>No measures at EU level</i>
✓ National measures to support non-motorized transport	Support for the development of cycle infrastructure in eligible regions under the European Structural and Investment funds
Road charges	<i>No EU-wide charges apply. Directives 1999/62/EC, 2006/38/EC, 2011/76/EC set common rules on distance-related (tolls) and time-based (vignettes) road user charges for heavy goods vehicles</i>

Energy

✓ Energy/carbon emission standards LDV	EU CO ₂ efficiency targets Passenger cars: 95 g/km (2021) Light commercial: 147 g/km (2020)
Energy/carbon emission standards HDV	<i>No standard</i>
✓ Pricing instruments	Inclusion of domestic and international aviation in EU-ETS
✓ Mandatory vehicle labelling	Car Labelling Directive 1999/94/EC
Support mechanism for electric vehicles & charging infrastructure	<i>Standards for interoperability of charging infrastructure</i> <i>No known direct incentives for EVs at the EU-level.</i> <i>From 2007 to 2013, the EU's TEN-T program invested more than 4 million euros funding in 155 fast charging stations along main motorways in northern Europe</i>
✓ Support for other low-carbon fuels and propulsion systems	Renewable energy targets 2020: 10% of transport fuels from renewable sources Fuel Quality Directive (2009/30/EC) requires member states to reduce the GHG intensity of fuel by 6% by 2020 Clean Vehicles Directive 2009/33/EC Directive 2014/94/EU on Deployment of Alternative Fuels Infrastructure
✓ Mandatory biofuel targets	The EU has a mandatory requirement of 10% renewable energy in transport by 2020, with a cap of 7% for first generation biofuels. The revised directive encourages member states to define mandatory requirements for advanced biofuels, providing a reference value of 0.5% by 2020. Fuel suppliers are also required to reduce the greenhouse gas intensity of the EU fuel mix by 6% by 2020 in comparison to 2010.

Source: See national sources EU

FRANCE

With 67 million inhabitants, France is the second most populous country in Europe. Nearly 20% of the population is clustered in the Paris region, and the transport system is similarly centralised, with many roads and railway lines leading to and from the French capital. Road transport is by far the leading mode of transport for passengers and freight, despite the country's extensive rail and waterway systems.

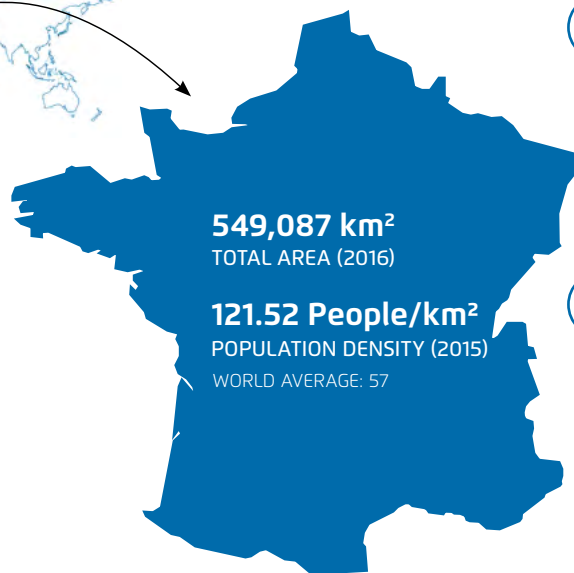
France has set ambitious targets for the transport sector. By 2020 it aims to reduce transport emissions back to 1990 levels. By 2050 emissions are to be reduced by 70% in relation to 2013 levels. France has implemented a wide range of measures to promote low-carbon transport and energy sectors, including the goal of removing GHG emitting cars from the market by 2040.

Source: BUR 2016 France; CIA World Factbook



0.4%

Share of global area



Sources: World Development Indicators



0.90 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



WORLD AVERAGE: 0.72

Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



37,775 constant 2011 international \$ (PPP)

GDP PER CAPITA (2015)

1,000 \$



G20 AVERAGE: 18,379



WORLD AVERAGE: 14,725



2.32%

SHARE IN GLOBAL GDP (2015)



POPULATION

66.5 mio people

POPULATION CURRENT IN 2015

0.9%

SHARE IN GLOBAL POPULATION IN 2015



URBANISATION

79.5% of total

URBAN POPULATION IN 2015

74.86%

G20 AVERAGE¹

53.86%

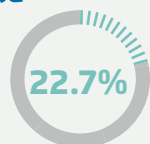
WORLD AVERAGE



15,084.221 people

POPULATION IN URBAN AREAS OF > 1 MIO (2015)

SHARE IN TOTAL POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

639 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE (2015)

100 Inhabitants

100 Motor Vehicles



970,536 mio passenger-km

PASSENGER TRANSPORT VOLUME* (2014)



214,765 mio tonne-km

FREIGHT TRANSPORT VOLUME** (2014)



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators

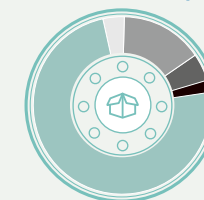
Passenger-km per mode



Road, Car: 85%
Road, Bus: 6%
Rail: 9%

Year: 2014

Tonne-km per mode



Road: 74%
Inland waterways: 4%
Rail: 15%
Pipeline: 5%
Domestic Air: 2%

Year: 2014

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

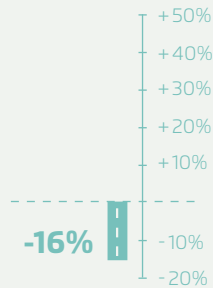


TOTAL EMISSIONS

Total CO₂ emissions from fuel combustion in France have decreased by 16% since 1990 and per capita emissions are just below the world average. Over the same period, however, transport sector emissions have increased by almost 8%, after falling from a peak in 2002. Under a business-as-usual scenario, sector emissions are projected to increase between 2% and 31% by 2030. As the French energy sector relies heavily on nuclear power, energy-sector CO₂ emissions are relatively low, causing transport to represent 42% of emissions in 2015.

290.49 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2015)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2015)

4.37

G20 Average¹:
8.4

World Average:
5

t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990-2015)



SHARE IN GLOBAL EMISSIONS (2015)

0.9%

Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

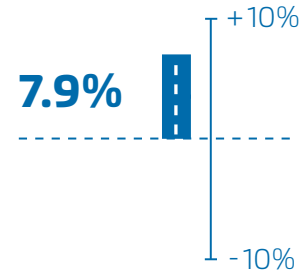


TRANSPORT SECTOR EMISSIONS

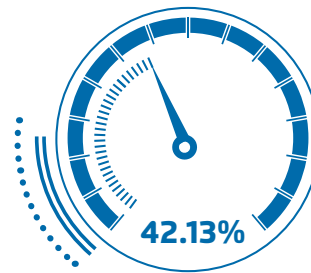
122.38 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990-2015)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015

1.84

2030

2.12

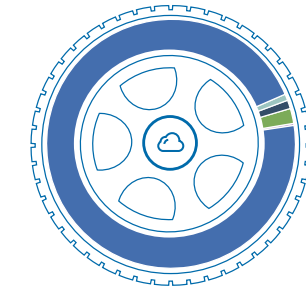
t CO₂ per capita

G20 Average¹:
1.11

G20 Average¹:
2.33

Sources: IEA, UNDESA, SloCaT

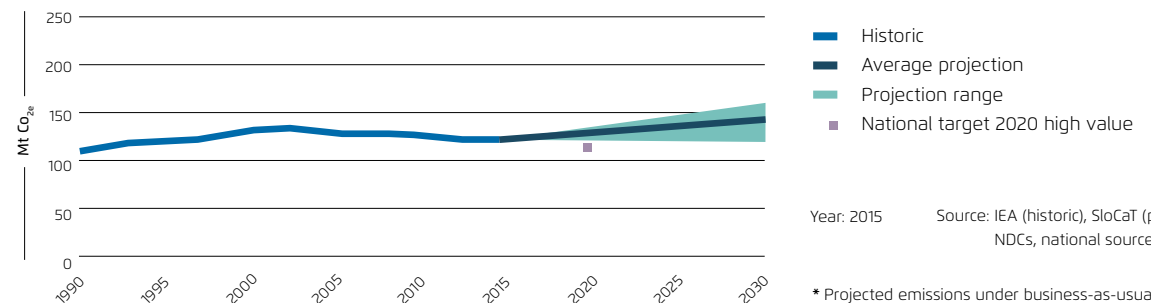
Transport emissions by subsector



Road: 96%
Rail: 0.8%
Domestic Navigation: 1.1%
Domestic Aviation: 2%
Pipeline: 0%
Other: 0.1%

Year: 2015 Source: IEA

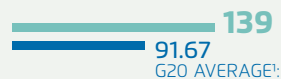
Historic and projected* emissions in the transport sector



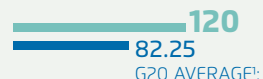


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

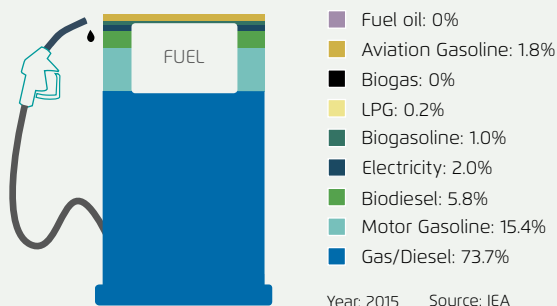


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel

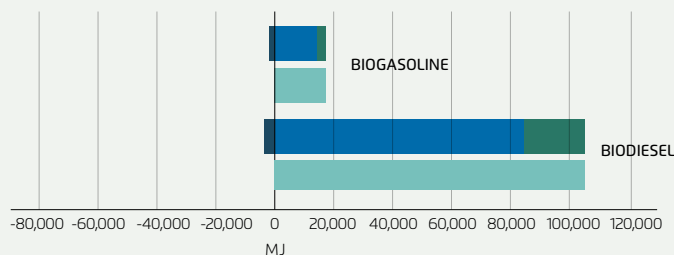


SHARE OF BIOFUELS IMPORTED (2015)



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



* Excluding biogas, as this is mostly used in other sectors

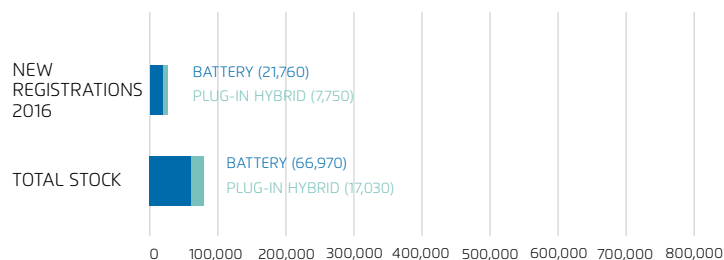
Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)

NEW REGISTRATIONS OF ELECTRIC CARS (2016)

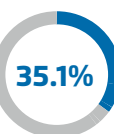


Year: 2016

MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2016)

1.46%

SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2016)



NO DATA (SHARE OF ELECTRIC CARS IN TOTAL PASSENGER CAR STOCK)



PUBLICLY ACCESSIBLE CHARGE INFRASTRUCTURE (2016)

■ 14,612 *
SLOW CHARGE

■ 1,231 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: IEA EV Outlook 2017

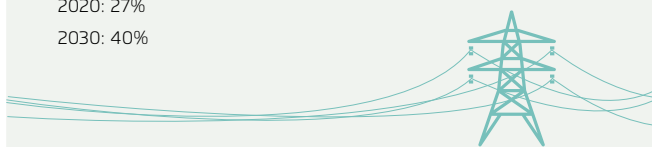


LINKAGES TO THE ENERGY SECTOR

France has the lowest grid emission factor within the G20, thanks to power generation predominantly from nuclear, followed by renewables. Various policies promote RES development in France, including a feed-in and premium tariff system, tax incentives, training programmes, certification schemes and R&D support.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources
2020: 27%
2030: 40%



46.3 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total electricity output

16.4%
SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

10,178 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

2.4%
SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators, RES LEGAL Europe



AMBITION

NDC target

See EU: committed to a 40% reduction in GHG emissions in 2030 compared to 1990

Transport related target *no mention*

Transport related measures *no mention*

Targets at national level

- In 2009 France set the target of reducing greenhouse gas emissions from transport to their 1990 level by 2020.
- The Low Carbon Strategy submitted to the UNFCCC sets a target to reduce transport emissions by 29% compared to 2013 levels by the third carbon budget, and by at least 70% by 2050.
- In July 2017, France set the goal of taking greenhouse gas emitting cars off the market by 2040.

Source: NDC, Law no 2009-967; National Low Carbon Strategy 2016; Climate Plan 2017



TRADE-OFF'S

Sustainability of biofuels

The EU Renewable Energy Directive establishes two sets of criteria to promote the sustainability of biofuels production:

- GHG emissions savings and land use requirements must be at least 50% (60% for new installations in 2018), and (2) biodiesel may not be produced on land that was converted from high carbon density conditions such as rainforests.
- To demonstrate compliance with the EU sustainability criteria, biofuels need to be validated by national verification systems or by one of 20 voluntary schemes approved by the EC.

Source: European Commission

Subsidies

3 Billion euro

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Fossil fuel subsidies in France mainly take the form of partial or full exemptions and VAT and excise duty refunds on oil products. Users in the farming, forestry and construction sectors as well as road freight above 7.5t benefit from lower rates of excise tax. Petroleum products sold in Corsica benefit from a reduced VAT rate. Domestic aviation and domestic freight on waterways are exempt from excise tax.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Development of High Speed Railway Lines (HSL) and dedicated-lane public transport (1800 km outside the Ile-de-France by 2020)
✓ Measures to support low-carbon freight logistics	Objectif CO ₂
National-level measures to support new mobility services	<i>No measures at national level</i>
✓ National measures to support non-motorized transport	Action Plan for Soft Mobility - Walking and Cycling
✓ Road charges	Heavy vehicle eco-tax per km for using the national private road network

Energy

✓ Energy/carbon emission standards LDV	EU CO ₂ efficiency targets Passenger cars: 95 g/km (2021) Light commercial: 147 g/km (2020)
Energy/carbon emission standards HDV	<i>No standard</i>
✓ Pricing instruments	Bonus-malus system based on CO ₂ Tax on high CO ₂ cars Carbon tax on fossil fuels not covered by the EU-ETS
✓ Mandatory vehicle labelling	National implementation of the EU Car Labelling Directive 1999/94/EC
✓ Support mechanism for electric vehicles & charging infrastructure	CO ₂ /km-based eco bonus-malus scheme Tax credit or subsidies for the installation of residential or workplace chargers Mandated share of 'installation ready' charging infrastructure for new buildings Company car tax credits
✓ Support for other low-carbon fuels and propulsion systems	Energy Transition for Green Growth Law 2015: 15% of transport fuels from renewable sources EU Fuel Quality Directive (2009/30/EC) requires member states to reduce the GHG intensity of fuel by 6% by 2020 Clean Vehicles Directive 2009/33/EC
✓ Mandatory biofuel targets	The EU has a mandatory requirement of 10% renewable energy in transport by 2020, with a cap of 7% for first generation biofuels. This also applies to France, which has set mandatory shares of 7.5% for bioethanol and 7.7% for biodiesel, with limited shares for the double counting of advanced biofuels.

Source: See national sources France

GERMANY

Germany is the most populous country in Europe, with particularly dense urban clusters on its western borders. Germany lies on Baltic and North Seas, and has a well established network of navigable waterways. Despite its comparatively small size, the country has the 12th largest railway network and the 18th largest waterway system worldwide. Nevertheless, road transport is by far the most important mode of transport for passengers and freight, and its importance has increased in recent decades. High levels of local congestion and air pollution are an issue, particularly in select urban centres. Numerous cities have continuously failed to meet EU caps on airborne particulates.

Germany has set an absolute target for domestic transport sector emissions in 2030 of 95–98 Mt CO₂. Germany has implemented a number of measures to enhance energy efficiency and reduce the carbon content of fuels, but has done less to promote alternative modes of transport.

Source: 6th National Communication; CIA World Factbook



0.3%
Share of global area



Sources: World Development Indicators, OECD



0.93 HDI*
HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



43,788 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

1,000 \$



G20
AVERAGE:
18,379



WORLD
AVERAGE:
14,725



3.31%
SHARE IN GLOBAL GDP (2015)



POPULATION

81.7 mio people
POPULATION CURRENT
IN 2015

1.1%
SHARE IN GLOBAL
POPULATION IN 2015

Source: World Development Indicators



URBANISATION

75.3% of total
URBAN POPULATION
IN 2015

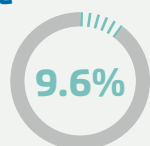
74.86%
G20 AVERAGE¹

53.86%
WORLD AVERAGE



7,868,538 people
POPULATION IN URBAN
AREAS OF > 1 MIO (2015)

9.6%
SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators



MOBILITY

685 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE
(2015)

1 = 100 Inhabitants
1 = 100 Motor Vehicles



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators

1,090,566 mio passenger-km

PASSENGER TRANSPORT
VOLUME* (2014)



506,589 mio tonne-km

FREIGHT TRANSPORT
VOLUME** (2014)



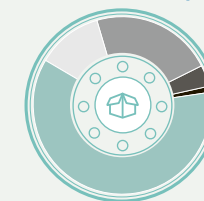
Passenger-km per mode



■ Road, Car: 85%
■ Road, Bus: 9%
■ Rail: 8%

Year: 2014

Tonne-km per mode



■ Road: 61%
■ Inland waterways: 12%
■ Rail: 22%
■ Pipeline: 4%
■ Domestic Air: 1%

Year: 2014

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting



TOTAL EMISSIONS

Germany's total CO₂ emissions from fuel combustion have decreased by 22% since 1990. Emissions in the transport sector increased up to 1999, decreased until 2009 and have been slowly growing since then. In 2015, emissions from transport were just below 1990 levels. Per capita emissions of the transport sector are almost exactly at the G20 average. Given current trends, transport sector emissions are projected to grow by as much as 44% by 2030 while also capturing a larger share of overall emissions. Road transport is by far the largest source of German transport-sector emissions, with a 94% share, followed by rail, representing just 4% of emissions.

729.77 Mt CO₂



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2015)

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2013)



8.93



G20 Average¹:
8.4



World Average:
5

t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990–2015)



SHARE IN GLOBAL EMISSIONS (2015)

2.25%

Sources: UNFCCC, UNDESA, ITF/OECD

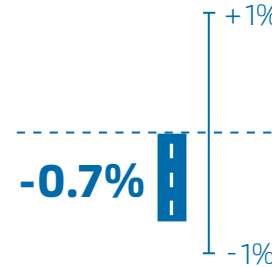


TRANSPORT SECTOR EMISSIONS

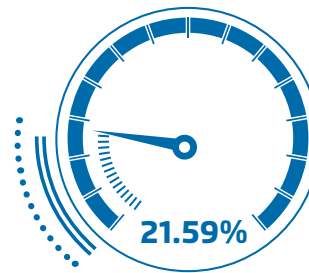
157.54 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2015)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015



1.93

2030



2.15

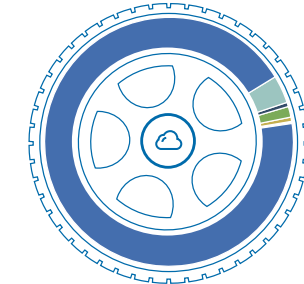
G20 Average¹:
1.11

G20 Average¹:
2.33

t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

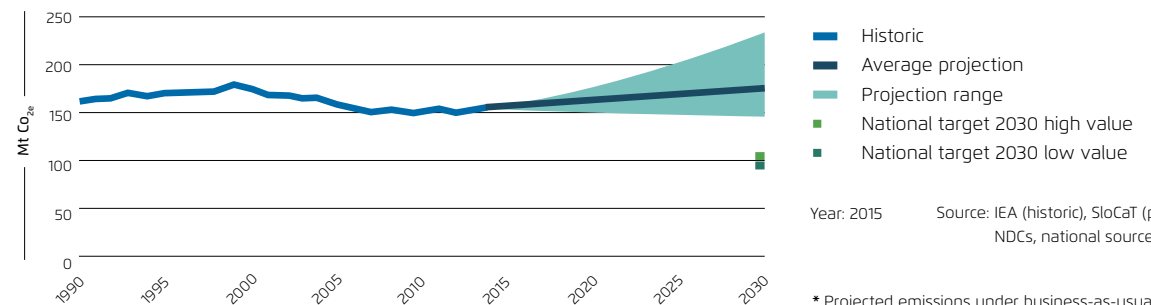
Transport emissions by subsector



Road: 93.8%
Rail: 3.7%
Domestic Navigation: 0.6%
Domestic Aviation: 1.4%
Pipeline: 0.4%
Non-specified: 0.2%

Year: 2015 Source: IEA

Historic and projected* emissions in the transport sector

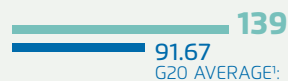


* Projected emissions under business-as-usual scenario

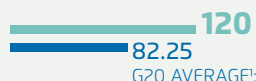


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

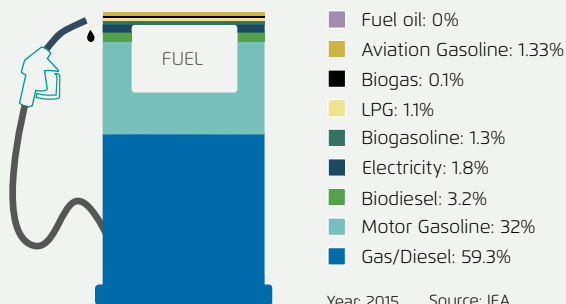


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



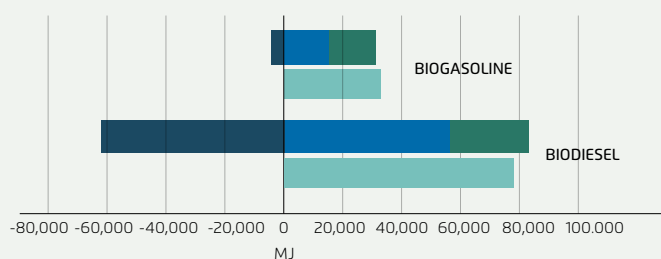
Year: 2015 Source: IEA

SHARE OF BIOFUELS IMPORTED (2015)



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



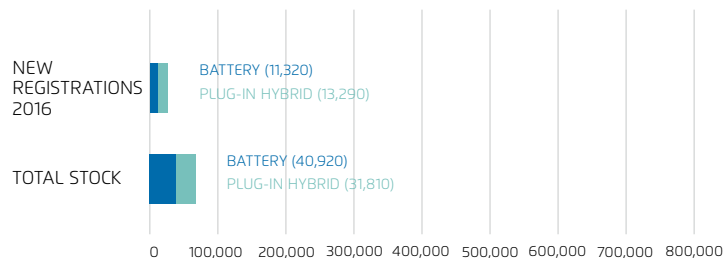
* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



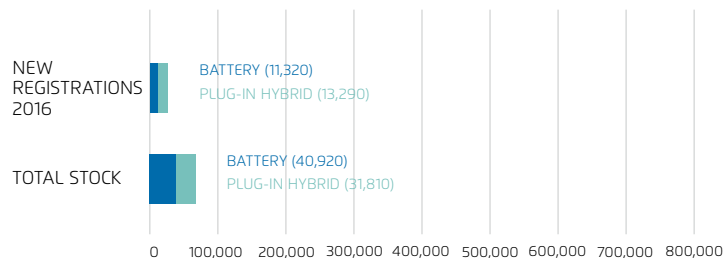
ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)



Year: 2016

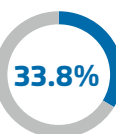
NEW REGISTRATIONS OF ELECTRIC CARS (2016)



MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2016)

0.73%

SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2016)



SHARE OF ELECTRIC CARS IN TOTAL PASSENGER CAR STOCK (2016)



PUBLICLY ACCESSIBLE CHARGE INFRASTRUCTURE (2016)

■ 16,550 *
SLOW CHARGE

■ 1,403 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: IEA EV Outlook 2017



LINKAGES TO THE ENERGY SECTOR

Coal is still the dominant fuel source for power generation in Germany, representing 44% of the power mix (global average: 39%). Germany has a renewable energy law (EEG) that regulates access for renewables and provides incentives. The law used to set fixed feed-in tariffs for individual technologies over a 20-year period. In 2017 an auction system was rolled out for wind and biomass. Rooftop PV installations below 750 kW still receive a fixed feed-in tariff.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources

- 2025: 40–45%
- 2035: 55–60%
- 2050: 80%

450.1 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

11,279 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, Covenant of Mayors,
World Development Indicators, RES LEGAL Europe



AMBITION

NDC target

See EU: committed to a 40% reduction in GHG emissions in 2030 compared to 1990.

Transport related target *no mention*

Transport related measures *no mention*

Targets at national level

- The National Climate Plan 2050 sets an absolute target for 2030 at 95–98 MtCO_{2e}.
- The Energy Strategy from 2010 sets the target to reduce primary energy consumption in the transport sector by 10% by 2020 and 40% by 2050.
- The National Sustainability Strategy 2016 set targets to reduce primary energy consumption for passenger transport and freight by 15-20% by 2030 compared to 2005.
- The German government has also set the target of 1 million electric vehicles by 2020.

Source: NDC, National Climate Plan 2050; Energy Strategy 2010; National Sustainability Strategy 2016



TRADE-OFF'S

Sustainability of biofuels

The EU Renewable Energy Directive establishes two sets of criteria to promote the sustainability of biofuels production:

- GHG emissions savings and land use requirements must be at least 50% (60% for new installations in 2018), and
- biodiesel may not be produced on land that was converted from high carbon density conditions such as rainforests.

To demonstrate compliance with the EU sustainability criteria, biofuels need to be validated by national verification systems or by one of 20 voluntary schemes approved by the EC.

Source: OECD

Subsidies

1 Billion euros

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Kerosene for aviation and fuel used for domestic navigation are exempt from fuel tax and international flights are additionally exempt from VAT. Tax deductions for commuting and for company fleets incentivise the use of cars at the expense of more climate friendly modes of transport.

Source: OECD



IMPLEMENTATION

Mobility

National programmes to support shift to public transport	<i>No measures at national level</i>
✓ Measures to support low-carbon freight logistics	Public grants for transport hubs to support modal shift from road to rail and waterways Subsidies for the expansion and re-activation of unused rail infrastructure
National-level measures to support new mobility services	<i>No measures at national level</i>
✓ National measures to support non-motorized transport	National Cycling Plan 2020 National competition for measures to increase cycling, including delivery services
✓ Road charges	Toll for heavy goods vehicles (Federal Trunk Road Toll Act), depending on the pollutant class

Energy

✓ Energy/carbon emission standards LDV	EU CO ₂ efficiency targets Passenger cars: 95 g/km (2021) Light commercial: 147 g/km (2020)
Energy/carbon emission standards HDV	<i>No standard</i>
✓ Pricing instruments	Circulation tax partly based on CO ₂ . VAT discount for public transport
✓ Mandatory vehicle labelling	National implementation of the EU Car Labelling Directive 1999/94/EC
✓ Support mechanism for electric vehicles & charging infrastructure	Purchase rebates for EVs at the limit of 400,000 cars until 2020 or EUR 600 million. Ten-year circulation tax exemption, reduced to five years from 2021. Tax deduction for company cars. Differentiated plates for EVs, allowing for differentiated measures. 300 mio Euro Investment subsidy programme for charging infrastructure
✓ Support for other low-carbon fuels and propulsion systems	Renewable energy targets 2020: 10% of transport fuels from renewable sources. Fuel Quality Directive (2009/30/EC) requires member states to reduce the GHG intensity of fuel by 6% by 2020. Clean aVehicles Directive 2009/33/EC. Subsidies for LNG use in shipping
✓ Mandatory biofuel targets	The EU has a mandatory requirement of 10% renewable energy in transport by 2020, with a cap of 7% for first generation biofuels. This also applies to Germany, which moved from mandated shares of biofuels to a mandatory reduction in GHG emissions of 4%, compared to the fossil fuel equivalent, which is scheduled to increase to 6% by 2020

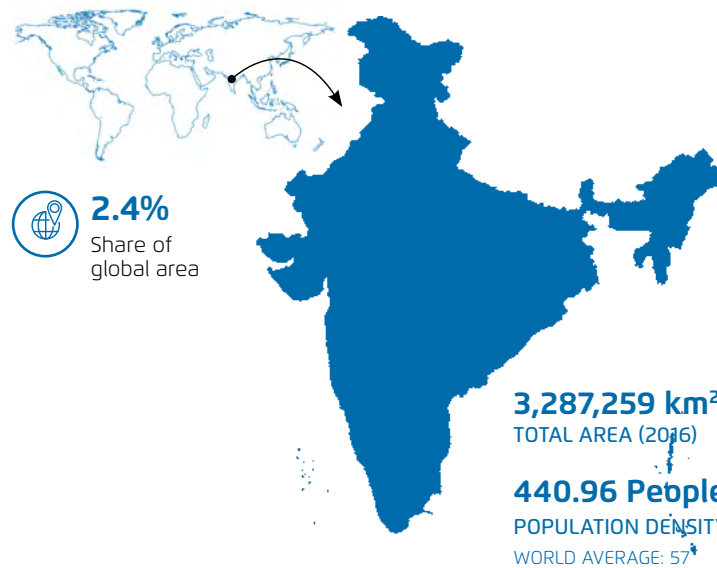
Source: See national sources Germany

INDIA

India is very densely populated, with the exception of the deserts in the northwest and mountains in the north. The country's road network is the second largest in the world after the US. The total number of road vehicles grew at an average of 10% per year between 2005 and 2012, which, together with increasing urbanisation, has led to greater traffic congestion and air pollution problems. Indian Railways (IR) is an important transport provider, serving a large share of freight and passenger traffic demand. Some 48% of the rail network is electrified. India has an extensive network of inland waterways, with a navigable length of 14,500 km.

India is committed to further increasing the share of rail in land transport to 45%, but does not have overall emissions or energy targets for the transport sector. India has measures in place to support public transport and low-carbon freight, as well as policies to enhance the energy and carbon efficiency of vehicles.

Source: BUR 2015 India; CIA World Factbook



0.62 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



5,733 constant 2011 international \$ (PPP)

GDP PER CAPITA (2015)

1,000 \$



6.95%

SHARE IN GLOBAL GDP (2015)



POPULATION

1,311.1 mio people

POPULATION CURRENT
IN 2015

17.8%

SHARE IN GLOBAL
POPULATION IN 2015



URBANISATION

32.7% of total

URBAN POPULATION
IN 2015

74.86%

G20 AVERAGE¹

53.86%

WORLD AVERAGE



192,221,499 people

POPULATION IN URBAN
AREAS OF > 1 MIO (2015)

SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

**17 road motor
vehicles per 1,000
inhabitants**

MOTORISATION RATE
(2014)

1 = 100 Inhabitants
1 = 100 Motor Vehicles



**9,807,013 mio
passenger-km**

PASSENGER TRANSPORT
VOLUME* (2015)



**2,237,991 mio
tonne-km**

FREIGHT TRANSPORT
VOLUME** (2014)



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF Outlook 2017, ITF/OECD, World Development Indicators

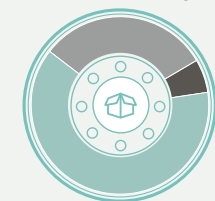
Passenger-km per mode



Road, Car: 88%
Road, Bus: 0%
Rail: 12%

Year: 2015

Tonne-km per mode



Road: 63%
Inland waterways: 0%
Rail: 31%
Pipeline: 6%
Domestic Air: 0%

Year: 2014

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting



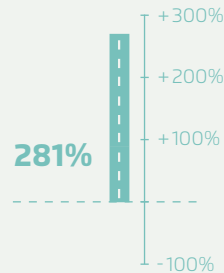
TOTAL EMISSIONS

India's total CO₂ emissions from fuel combustion have almost tripled since 1990. Transport sector emissions grew at a slightly lower rate, increasing almost 260% over the same period and represent an uncharacteristically low share of just over 11%. With 1.5 t CO₂ for total emissions and 0.18 t CO₂ for the transport sector, per capita emissions are the lowest in the G20. Nevertheless, transport sector emissions could almost quadruple until 2030. Road transport is the main contributor to sector emissions, followed by rail transport with almost 9%.

2,019.67 Mt CO₂



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2014)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2014)

1.54

G20 Average¹: 8.4

World Average: 5



t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990–2014)



SHARE IN GLOBAL EMISSIONS (2014)

6.24%



Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

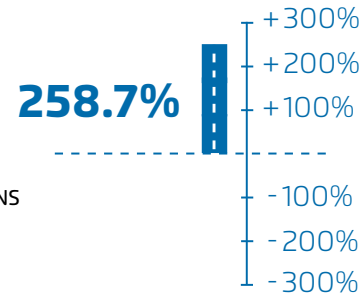


TRANSPORT SECTOR EMISSIONS

231.83 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2014)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2014)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2014)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2014/2030)



2015

0.18

G20 Average¹: 1.11

2030

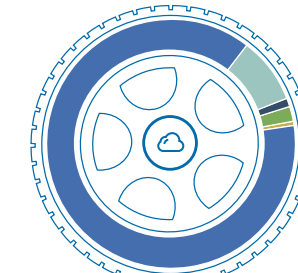
0.42

G20 Average¹: 2.33

t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

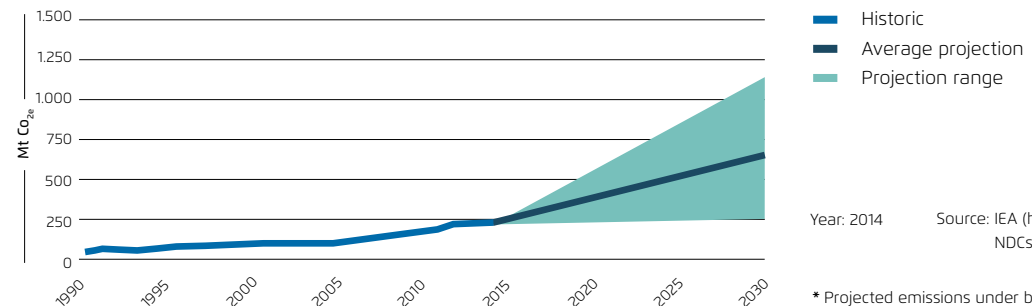
Transport emissions by subsector



Road: 87.8%
Rail: 8.8%
Domestic Navigation: 0.9%
Domestic Aviation: 2.2%
Pipeline: 0.3%
Other: 0%

Year: 2014 Source: IEA

Historic and projected* emissions in the transport sector

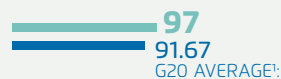


* Projected emissions under business-as-usual scenario

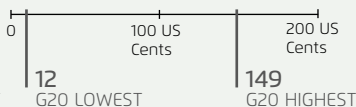
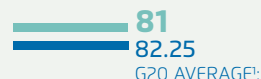


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

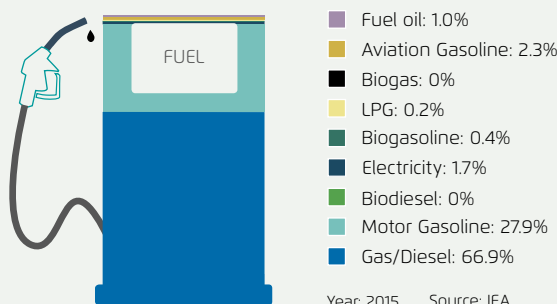


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



Year: 2015 Source: IEA

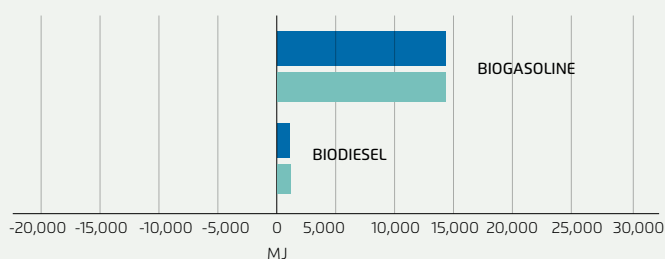
SHARE OF BIOFUELS IMPORTED (2015)

0%



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



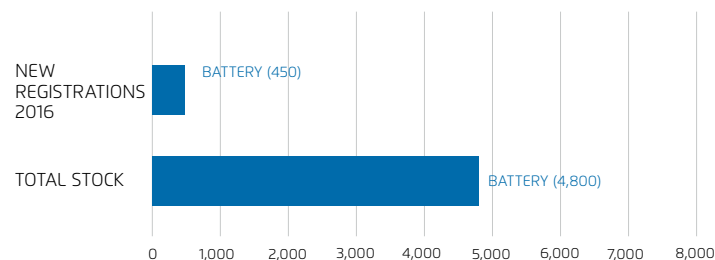
* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)



Year: 2016

NEW REGISTRATIONS OF ELECTRIC CARS (2016)

MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2016)

0.02%



SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2016)

9.4%

PUBLICLY ACCESSIBLE CHARGE INFRASTRUCTURE (2016)

■ 328 *
SLOW CHARGE

■ 25 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

NO DATA (SHARE OF ELECTRIC CARS IN TOTAL PASSENGER CAR STOCK)

%

Source: IEA EV Outlook



LINKAGES TO THE ENERGY SECTOR

Coal is still the dominant fuel source for power generation in India, representing 75% of total generation (global average: 39%). The development of renewable energy in India is supported under the Electricity Act of 2003 and the National Electricity Policy of 2005. The Electricity Act of 2003 stipulates that utilities must procure a certain percentage of power from renewable energy sources. The National Electricity Policy of 2005 mandates a progressive increase in the share of electricity from non-conventional sources. Several other incentives have been introduced, including generation based incentives (GBI), feed-in tariffs (FIT), depreciation benefits and tax incentives.

In 2011, India launched the Renewable Energy Certificates (REC) programme, a market-based mechanism for driving renewable energy development and investment.

The Indian Renewable Energy Development Agency (IREDA) provides loans and channels funds for renewable energy development.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources
(excluding hydro >25 MW)

2030: 40%

2022: 145 GW installed capacity target



771.3 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total electricity output

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

16,824 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators, reegle;
IRENA REmap India 2017



AMBITION

NDC target

Committed to reduce the emissions intensity of GDP by 33–35% in 2030 compared to 2005

Transport related target

Increase the share of railways in total land transport from 36% to 45%

Transport related measures

Promotion of hybrid and electric vehicles
National policy on biofuels
Passenger car fuel-efficiency standards
Construction of metro lines, urban transport and mass rapid transport projects
Promote growth of coastal shipping and inland water transport

Targets at national level

India does not have a specific national emission target for the transport sector, but the National Electric Mobility Mission Plan 2020 sets a target of 30–35% share of CNG vehicles in new vehicle sales by 2020 and foresees 5–7 million electric vehicles by 2020.

Source: NDC, National Electric Mobility Mission Plan 2020



TRADE-OFF'S

Sustainability of biofuels

Biofuel are only to be derived from non-feed stock that is grown on degraded soils or wastelands not otherwise suited for agriculture, thus avoiding a possible conflict between fuel and food security. No biofuels may be produced from sugarcane or sugarcane juice.

Source: Government of India, Biofuel Policy

Subsidies

332 Billion rupees

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Price subsidies for petrol were completely discontinued in 2014. Support for other fuel types remains, mainly in the form of a compensation scheme for under-recoveries incurred by downstream oil companies for diesel fuel, although diesel prices are also being increased with the aim of eliminating the subsidy.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Expansion of metro rail systems Smart Cities Mission Atal Mission for Rejuvenation and Urban ransformation
✓ Measures to support low-carbon freight logistics	Dedicated Freight Corridors (DFCs) for rail freight Various initiatives to support Coastal Shipping and Inland Water Transport Electrification of Indian Railways
National-level measures to support new mobility services	<i>No measures at national level</i>
✓ National measures to support non-motorized transport	National Bicycle Sharing Scheme incl. various guidelines and toolkits
Road charges	<i>No general charges at national level</i> <i>Some toll highways operational by concessionaries on Build Operate and Transfer (BOT) basis</i>

Energy

✓ Energy/carbon emission standards LDV	CO ₂ efficiency target 2020: 113 g/km
Energy/carbon emission standards HDV	<i>No standard</i>
✓ Pricing instruments	Carbon tax (Clean Energy Cess) Performance, Achieve and Trade Scheme (PAT) for heavy industry
✓ Mandatory vehicle labelling	BEE Fuel Savings Guide label
✓ Support mechanism for electric vehicles & charging infrastructure	FAME Scheme (includes several omponents, such as demand incentives and pilot projects) as part of the National Electric Mobility Mission Plan 2020 (NEMMP)
✓ Support for other low-carbon fuels and propulsion systems	Hydrogen Corpus Fund National bio-diesel mission National policy on biofuels
✓ Mandatory biofuel targets	India has a mandated share of 22.5% for bioethanol (up from 10%), and 5% for biodiesel.

Source: See national sources India

INDONESIA

Indonesia, an archipelago with more than 17,000 islands, relies heavily on inter-island transport links. While the larger islands of Java, Sumatra, and Sulawesi have extensive road-dominated transport systems, many of the smaller, less developed islands rely on incomplete, fragmented, and poorly maintained road networks for internal travel and underdeveloped infrastructure for inter-island shipping. Java and Sumatra both have rail networks, but they offer limited freight service. The air sector is evolving rapidly, with strong growth driven by discount airlines.

Indonesia does not have formally expressed CO₂ targets for the transport sector, although an energy efficiency target for transport is under discussion. Measures implemented to date concentrate on the expansion of public transport and non-motorised transport systems in urban areas. Few measures are in place to support the energy/CO₂ efficiency of vehicles.

Source: Asian Development Bank



1,910,931 km²
TOTAL AREA (2016)

142.18 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57

Sources: World Development Indicators



0.69 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



10,385 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

1,000 \$

1,000 \$



G20
AVERAGE:
18,379



WORLD
AVERAGE:
14,725



2.47%

SHARE IN GLOBAL GDP (2015)



POPULATION

257.6 mio people

POPULATION CURRENT
IN 2015

3.5%

SHARE IN GLOBAL
POPULATION IN 2015

Source: World Development Indicators



URBANISATION

53.7% of total

URBAN POPULATION
IN 2015

74.86%

G20 AVERAGE¹

53.86%

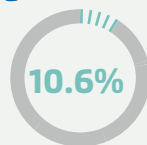
WORLD AVERAGE



27,191,206 people

POPULATION IN URBAN
AREAS OF > 1 MIO (2015)

SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators



MOBILITY

**50 road motor
vehicles per 1,000
inhabitants**

MOTORISATION RATE
(2014)

1 = 100 Inhabitants

1 = 100 Motor Vehicles



**No data
(passenger-km)**

PASSENGER TRANSPORT
VOLUME*

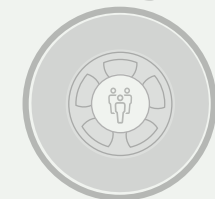


**No data
(tonne-km)**

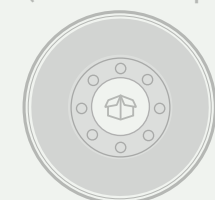
FREIGHT TRANSPORT
VOLUME**



**No data
(Passenger-km per mode)**



**No data
(Tonne-km per mode)**



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting



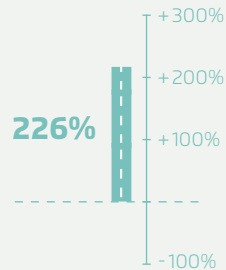
TOTAL EMISSIONS

Indonesia's total CO₂ emissions from fuel combustion have more than doubled since 1990, while transport sector emissions have more than tripled over the same period and could more than double up to 2030. Per capita emissions are among the lowest within the G20. Also, due to the geography of Indonesia, rail plays a very limited role. Road transport dominates sector emissions, although navigation and air transport do play an important role in connecting the country's islands.

436.53 Mt CO₂



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2014)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2014)

1.69

G20 Average¹:
8.4

World Average:
5

t CO₂ per capita



SHARE IN GLOBAL EMISSIONS (2015)

1.35%

Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

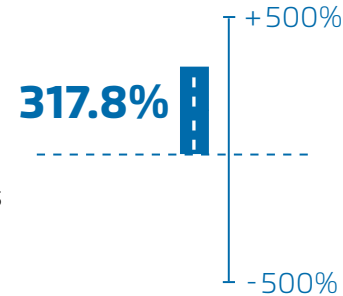


TRANSPORT SECTOR EMISSIONS

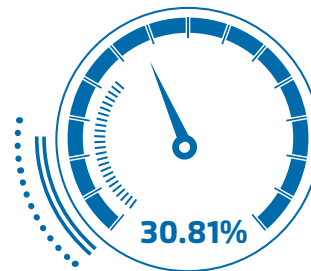
134.48 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2014)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2014)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2014)



TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2014/2030)



2015

0.52

G20 Average¹:
1.11

2030

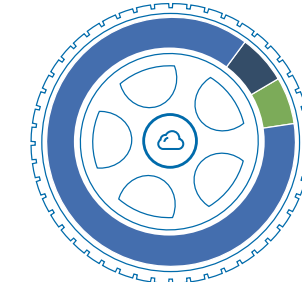
0.91

G20 Average¹:
2.33

t CO₂ per capita

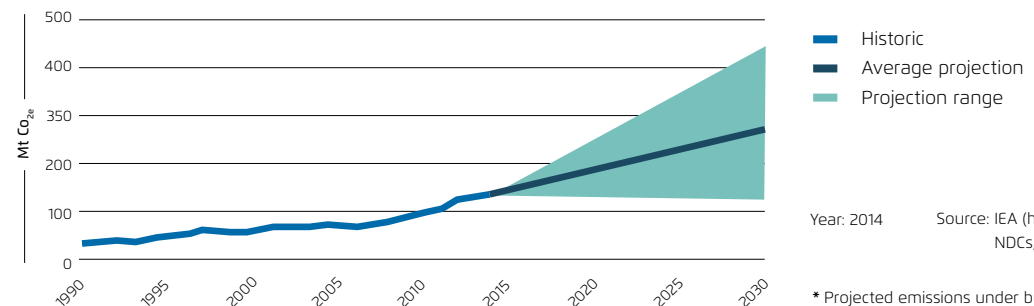
Sources: IEA, UNDESA, SloCaT

Transport emissions by subsector



Year: 2014 Source: IEA

Historic and projected* emissions in the transport sector



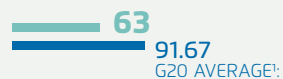
Year: 2014 Source: IEA (historic), SloCaT (projections), NDCs, national sources (targets)

* Projected emissions under business-as-usual scenario



ENERGY

US Cents/Litre GASOLINE PRICE (2016)

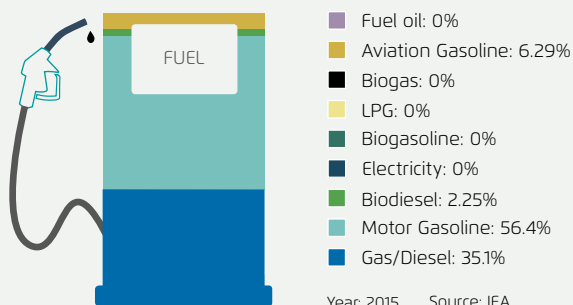


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



Year: 2015 Source: IEA

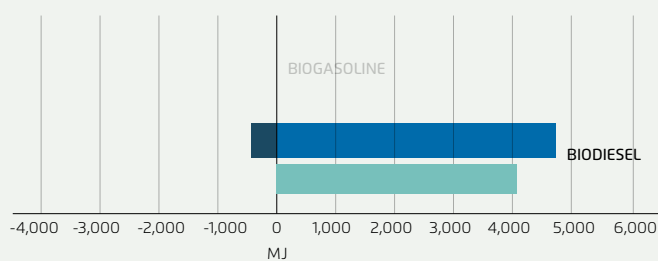
SHARE OF BIOFUELS IMPORTED (2015)

0%



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



ELECTRIC VEHICLES

NO DATA
(TOTAL STOCK OF
ELECTRIC CARS)

NO DATA
(NEW REGISTRATIONS OF
ELECTRIC CARS)

NEW
REGISTRATIONS
2016

NO DATA (BATTERY)
NO DATA (PLUG-IN HYBRID)

TOTAL STOCK

NO DATA (BATTERY)
NO DATA (PLUG-IN HYBRID)

0 100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000

Year: 2016

NO DATA (MARKET
SHARE OF ELECTRIC
CARS IN THE NATION-
AL MARKET)

%

NO DATA
(SHARE OF NEW
REGISTRATIONS IN
TOTAL EV STOCK)

%

NO DATA (SHARE OF
ELECTRIC CARS IN
TOTAL PASSENGER
CAR STOCK)

%

NO DATA (PUBLICLY
ACCESSIBLE
CHARGE INFRA-
STRUCTURE)

SLOW CHARGE

FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

20,000 units

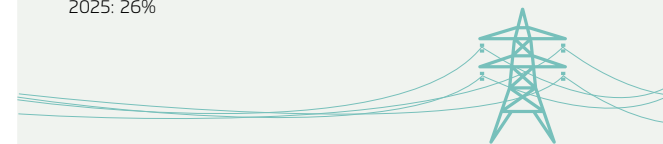


LINKAGES TO THE ENERGY SECTOR

Coal is still the dominant fuel source for power generation in Indonesia, representing 56% of total generation (global average: 39%). In February 2017 Indonesia issued its latest feed-in-Tariff regime, which holds that the national electricity company PLN must purchase all types of renewable energy. Besides energy derived from waste and geothermal energy, the maximum feed-in-tariff amounts to 85% of "Generating BPP", the average costs of generating electricity in a local area during the previous year. This encourages deployment of renewable energies in remote areas, where costly diesel generators dominate.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources
2025: 26%



732.6 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

11.4%
SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

No Data (GWh)

ELECTRICITY USE IN TRANSPORT
(2015)

NO DATA (SHARE IN TOTAL
ELECTRICITY USE)

* Including hydropower

Sources: IEA, World Development Indicators,
IRENA REmap Indonesia 2017



AMBITION

NDC target

Committed to a 29% unconditional, 41% conditional reduction in GHG emissions in 2030 compared to BAU

Transport related target

no mention

Transport related measures

Implementation of biofuel in the transportation sector (Mandatory B30)
Additional CNG fuel stations

Targets at national level

Indonesia does not have a specific national emission target for the transport sector, but the National Energy Plan (RUEN), which was enacted in 2017, sets a target scenario for fuel consumption as well as GHG evolution of the energy sector. This scenario should provide for GHG emissions reductions of 34.8% in 2025, 41.3% in 2030 and 58.3% in 2050.

Source: IEA Policy Database, NDC



TRADE-OFF'S

Sustainability of biofuels

Indonesia has no specific regulations for biofuel sustainability. However, there are several sustainability certification schemes available for biodiesel feedstocks and palm plantations. Programmes cover a range of common sustainability criteria, including greenhouse gas emissions, land use, biodiversity and labor.

Source: USDA

Subsidies

17,100 Billion rupiah

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

The Indonesian Government compensates state-owned Pertamina for selling Premium RON 88 gasoline, Solar diesel, and kerosene fuels below market-level prices. Following the reform of 2015, gasoline is now sold at market price. Support for this measure has therefore decreased dramatically in 2015.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Development of Intelligent Transport System (ITS), including bus priority system and shift to mass transportation Introduction of BRT systems in 12 cities Enhancing rail infrastructure, incl. electrification Sustainable Urban Transport Programme (SUTRI NAMA)
Measures to support low-carbon freight logistics	<i>No measures at national level</i>
National-level measures to support new mobility services	<i>No measures at national level</i>
✓ National measures to support non-motorized transport	Building of nonmotorized transport infrastructure in 12 cities
✓ Road charges	No general charges, but some toll roads Expansion of toll roads under development

Energy

Energy/carbon emission standards LDV	<i>No standard</i>
Energy/carbon emission standards HDV	<i>No standard</i>
✓ Pricing instruments	Luxury tax reduction for efficiency vehicles (based on fuel efficiency)
Mandatory vehicle labelling	<i>No mandatory labelling</i>
Support mechanism for electric vehicles & charging infrastructure	<i>Covered under pricing instruments</i> <i>Import duty cuts for spare parts announced</i>
✓ Support for other low-carbon fuels and propulsion systems	Pilot project to improve the use of natural gas as city transportation fuel in 9 cities Subsidy for biodiesel, covering difference to conventional diesel
✓ Mandatory biofuel targets	Indonesia has a mandatory share of 3% for bioethanol and 20% for biodiesel (up from 5%), which is scheduled to increase to 30% by 2020.

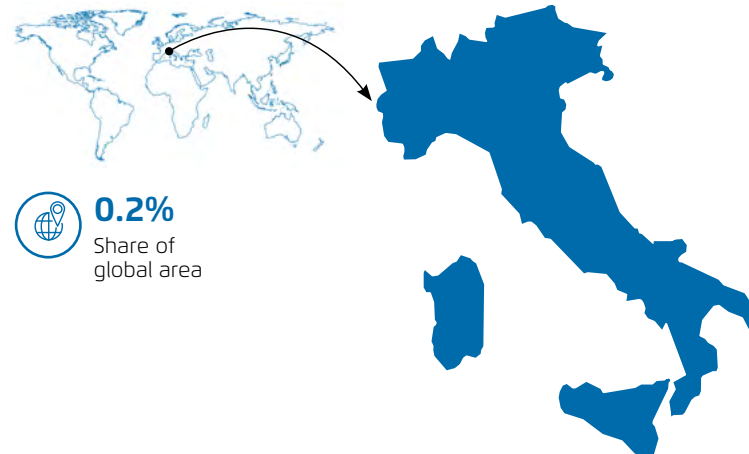
Source: See national sources Indonesia

ITALY

Italy is located on a peninsula in the Mediterranean Sea. Its population is fairly evenly distributed throughout the country, although some coastal areas and urban centers have high density levels. The country has well-developed road and railway systems. Both transport demand and the importance of road transport have increased since 1990. After peaking in 2007, transport sector emissions have been on the decline, falling more than 20% between 2007 and 2013, mainly due to the economic crisis in combination with greater penetration of energy efficient vehicles. Atypical for Europe, Italy has a very large fleet of motorbikes and mopeds (about 9.6 million vehicles in 2015).

Italy does not have a specific transport-related targets. It has implemented all EU directives at the national level, but has limited additional measures to support a modal shift or vehicle efficiency.

Source: BUR 2015 Italy; CIA World Factbook



301,340 km²
TOTAL AREA (2016)

206.47 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



0.89 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



34,220 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

1,000 \$

1,000 \$



WORLD AVERAGE: 14,725



WORLD AVERAGE: 14,725



1.92%

SHARE IN GLOBAL GDP (2015)



POPULATION

60.7 mio people

POPULATION CURRENT IN 2015

0.8%

SHARE IN GLOBAL POPULATION IN 2015



URBANISATION

69.0% of total

URBAN POPULATION IN 2015

74.86%

G20 AVERAGE¹

53.86%

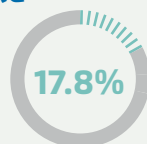
WORLD AVERAGE



10,783,587 people

POPULATION IN URBAN AREAS OF > 1 MIO (2015)

SHARE IN TOTAL POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

854 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE (2015)

1 = 100 Inhabitants

1 = 100 Motor Vehicles



833,638 mio passenger-km

PASSENGER TRANSPORT VOLUME* (2015)



141,091 mio tonne-km

FREIGHT TRANSPORT VOLUME** (2014)

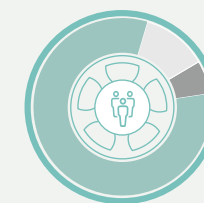


* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators

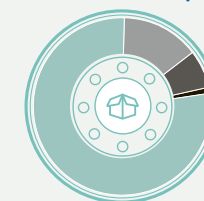
Passenger-km per mode



■ Road, Car: 82%
■ Road, Bus: 12%
■ Rail: 6%

Year: 2015

Tonne-km per mode



■ Road: 78%
■ Inland waterways: 0%
■ Rail: 14%
■ Pipeline: 7%
■ Domestic Air: 1%

Year: 2014

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

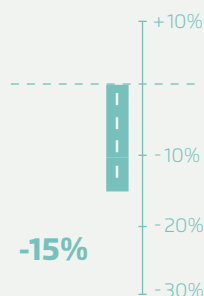


TOTAL EMISSIONS

Italy's total CO₂ emissions from fuel combustion have decreased by 15% since 1990 and per capita emissions are just above the world average. Transport emissions have grown by 7% over the same period. After peaking in 2007, they decreased until 2013, and have increased slightly since then. At 31%, the share of transport sector emissions is above world and G20 averages. Road transport is by far the main contributor to Italian emissions, with a 91% share, followed by domestic navigation and aviation.

330.75 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2015)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2015)

5.45



G20 Average¹:
8.4



World Average:
5



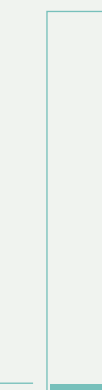
t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990-2015)



SHARE IN GLOBAL EMISSIONS (2015)

1.02%



Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

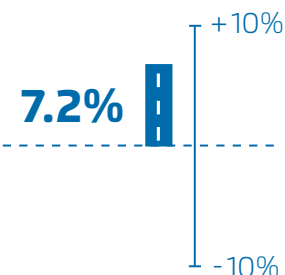


TRANSPORT SECTOR EMISSIONS

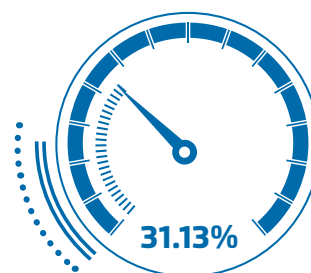
102.97 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990-2015)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015

1.70

G20 Average¹:
1.11

2030

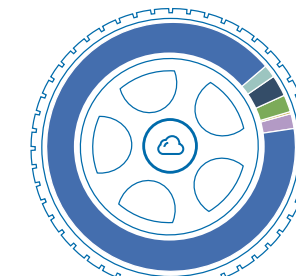
1.79

G20 Average¹:
2.33

t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

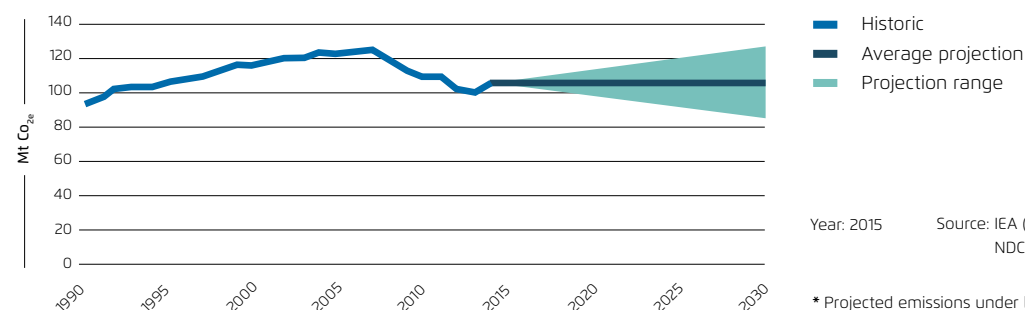
Transport emissions by subsector



Road: 91.3%
Rail: 1.7%
Domestic Navigation: 2.8%
Domestic Aviation: 2%
Pipeline: 0.5%
Non-specified: 1.7%

Year: 2015 Source: IEA

Historic and projected* emissions in the transport sector

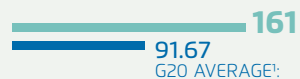


* Projected emissions under business-as-usual scenario

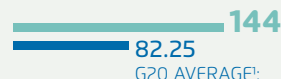


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

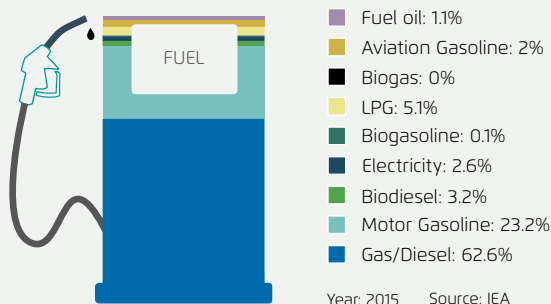


US Cents/Litre DIESEL PRICE (2016)

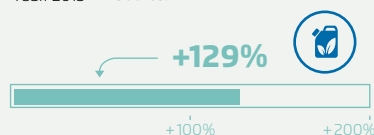


Source: GIZ SUTP

Energy use in transport by fuel

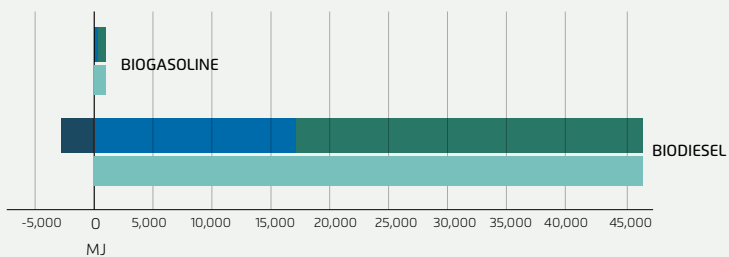


SHARE OF BIOFUELS IMPORTED (2015)



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



* Excluding biogas, as this is mostly used in other sectors

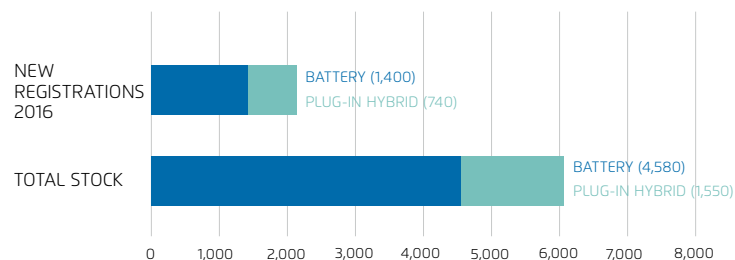
Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)

NEW REGISTRATIONS OF ELECTRIC CARS (2016)



Year: 2016

MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2015)

0.1%

SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2015)

34.9%

SHARE OF ELECTRIC CARS IN TOTAL PAS- SENGER CAR STOCK (2015)

0.02%

PUBLICLY ACCE- SSIBLE CHARGE INFRASTRUCTURE (2015)

■ 1,679 *
SLOW CHARGE

■ 70 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: IEA EV Outlook 2017



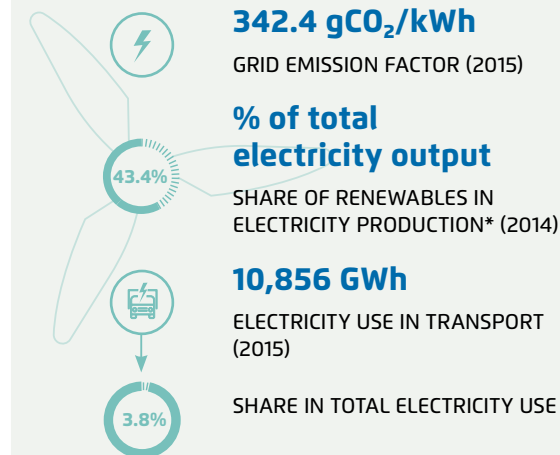
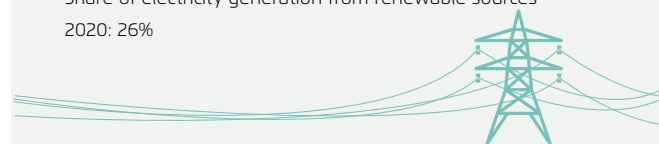
LINKAGES TO THE ENERGY SECTOR

Non-renewable electricity in Italy is mostly generated using natural gas, with a small share coming from coal. Electricity from renewable sources is mostly promoted through a combination of premium tariffs, feed-in tariffs and tender schemes. Tax regulation mechanisms are also in place for investment in RES-E plants. Interested parties can make use of net metering.

Grid operators are obliged to give priority access to renewable energy plants. They are also obliged to give priority dispatch to electricity from renewable sources. Plant operators can request the grid operator to expand the grid if the connection of a plant requires this expansion.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources
2020: 26%



* Including hydropower

Sources: IEA, World Development Indicators, RES LEGAL Europe



AMBITION

NDC target

See EU: committed to a 40% reduction in GHG emissions in 2030 compared to 1990

Transport related target *No mention*

Transport related measures *No mention*

Targets at national level

No national targets for the transport sector

Source: NDC



TRADE-OFF'S

Sustainability of biofuels

The EU Renewable Energy Directive establishes two sets of criteria to promote the sustainability of biofuels production:

- GHG emissions savings and land use requirements must be at least 50% (60% for new installations in 2018), and biodiesel may not be produced on land that was converted from high carbon density conditions such as rainforests.
- To demonstrate compliance with the EU sustainability criteria, biofuels need to be validated by national verification systems or by one of 20 voluntary schemes approved by the EC.

Source: European Commission

Subsidies

3 Billion euro

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Fuel used in domestic and EU-wide shipping is exempt from excise tax. Rail transport, public transport, taxis, and agricultural and military use benefit from varying rates of reduced excise tax. Trucking companies can obtain partial refunds for excise tax paid on diesel fuel.

Source: OECD



IMPLEMENTATION

Mobility

National programmes to support shift to public transport	<i>No specific measures</i>
Measures to support low-carbon freight logistics	<i>No specific measures</i>
National-level measures to support new mobility services	<i>No current measures, but incentive programme in the early 2000s</i>
National measures to support non-motorized transport	<i>No specific measures</i>
✓ Road charges	Tolls apply to most highways in Italy

Energy

✓ Energy/carbon emission standards LDV	EU CO ₂ efficiency targets Passenger cars: 95 g/km (2021) Light commercial: 147 g/km (2020)
Energy/carbon emission standards HDV	<i>No standard</i>
Pricing instruments	<i>No CO₂ or energy consumption based taxes</i>
✓ Mandatory vehicle labelling	National implementation of the EU Car Labelling Directive 1999/94/EC
✓ Support mechanism for electric vehicles & charging infrastructure	National Infrastructure Plan for Recharging Electric Vehicles defines an annual plan to guarantee the minimum level of service in main cities, defining standards and inter-operability among energy utilities and providers, with incentives to petrol network to install charging point within their local distributors.
✓ Support for other low-carbon fuels and propulsion systems	Renewable energy targets 2020: 10% of transport fuels from renewable sources Fuel Quality Directive (2009/30/EC) requires member states to reduce the GHG intensity of fuel by 6% by 2020 Clean Vehicles Directive 2009/33/EC
✓ Mandatory biofuel targets	The EU has a mandatory requirement of 10% renewable energy in transport by 2020, with a cap of 7% for first generation biofuels. This target also applies to Italy. Additionally, Italy is the first member to introduce a mandatory share of 0.6% for advanced biofuels by 2018, scheduled to increase to 1% in 2022.

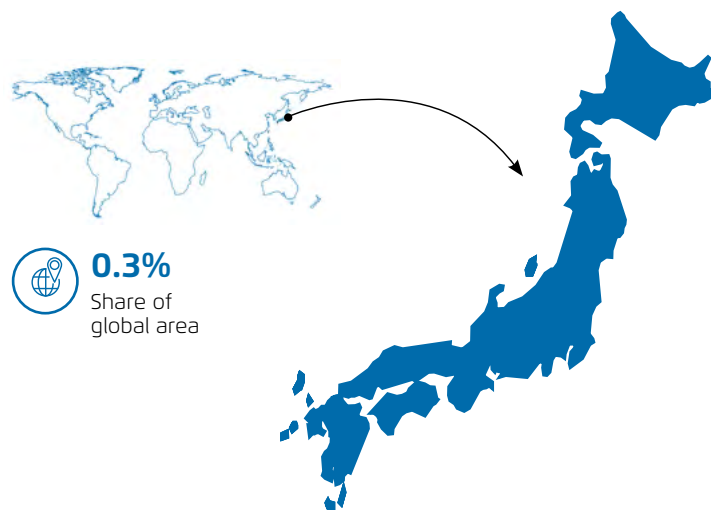
Source: See national sources Italy

JAPAN

Japan is composed of four main islands and 6,848 smaller islands and islets. All regions of high population density lie on the coast, with one-third of the population residing in and around Tokyo. Despite its comparatively small size, the country has the 11th largest railway network and the 6th largest road network globally. From the 1990s onward, passenger transport volume, along with the share of each transportation mode, has remained almost constant. Changes in the number of motor vehicles have been flat in recent years and began to decline in 2004. Nevertheless, Japan still has the third highest motorisation rate in the world. The share of air traffic is still small, but its transport volume grew significantly due to its time-saving features and the introduction of jet aircraft by domestic airlines, which resulted in an increase in the size and speed of air transport service. With the shift from coal to oil as an energy source and the development of heavy industry in coastal areas, domestic sea freight traffic grew. In contrast, the growth of freight traffic by rail barely increased and is relatively small, while the share of passenger transport by rail is around 31%.

Japan specifies the contribution of sectors to its NDC, requiring the transport sector to reduce GHG emissions by 27% below 2013 by 2030. The 2016 Plan for Global Warming Countermeasures defines the goal to achieve a 50–70% market share for new sales of next-generation low-carbon vehicles by 2030. This is supported by a wide range of measures, including the 'Top-Runner' efficiency standards for vehicles.

Source: 6th National Communication 2013 Japan; CIA World Factbook



377,962 km²
TOTAL AREA (2016)

348.25 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



0.90 HDI*
HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



37,872 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

1,000 \$



WORLD AVERAGE: 14,725



4.44%
SHARE IN GLOBAL GDP (2015)



Sources: World Development Indicators



POPULATION

127 mio people
POPULATION CURRENT IN 2015

1.7%
SHARE IN GLOBAL POPULATION IN 2015

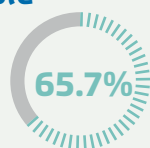


URBANISATION

93% of total
URBAN POPULATION IN 2015
74.86%
G20 AVERAGE¹
53.86%
WORLD AVERAGE



83,359,995 people
POPULATION IN URBAN AREAS OF > 1 MIO (2015)
65.7%
SHARE IN TOTAL POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

719 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE (2015)

1 = 100 Inhabitants
1 = 100 Motor Vehicles



1,292,485 mio passenger-km

PASSENGER TRANSPORT VOLUME* (2009)



239,699 mio tonne-km

FREIGHT TRANSPORT VOLUME** (2014)



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

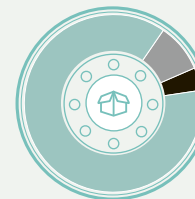
Sources: ITF/OECD, World Development Indicators

Passenger-km per mode



Year: 2009

Tonne-km per mode



Year: 2014

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

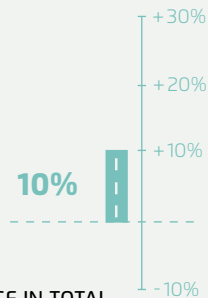


TOTAL EMISSIONS

Japan's total CO₂ emissions from fuel combustion have increased by 10% since 1990, with transport sector emissions increasing by 4% over the same period. After peaking around 2000, emissions in the transport sector have decreased relatively constantly, supported by a variety of measures to enhance vehicle efficiency. Road transport is responsible for 86% of sector emissions, with rail, domestic navigation and aviation capturing almost equal shares of remaining emissions.

1,141.58 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2015)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2015)



8.99

G20 Average¹:
8.4

World Average:
5



t CO₂ per capita



SHARE IN GLOBAL EMISSIONS (2015)

3.53%

Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

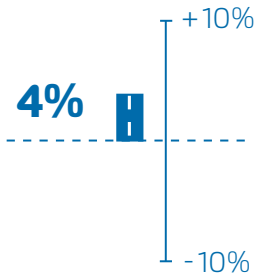


TRANSPORT SECTOR EMISSIONS

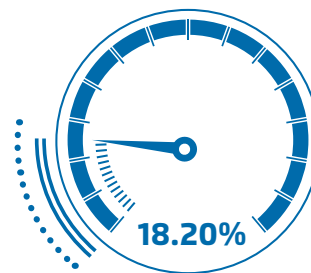
207.81 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990-2015)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015

1.64

G20 Average¹:
1.11

2030

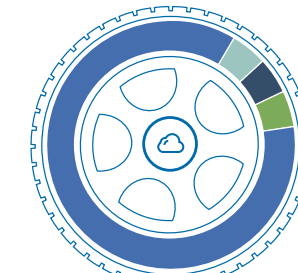
1.79

G20 Average¹:
2.33

t CO₂ per capita

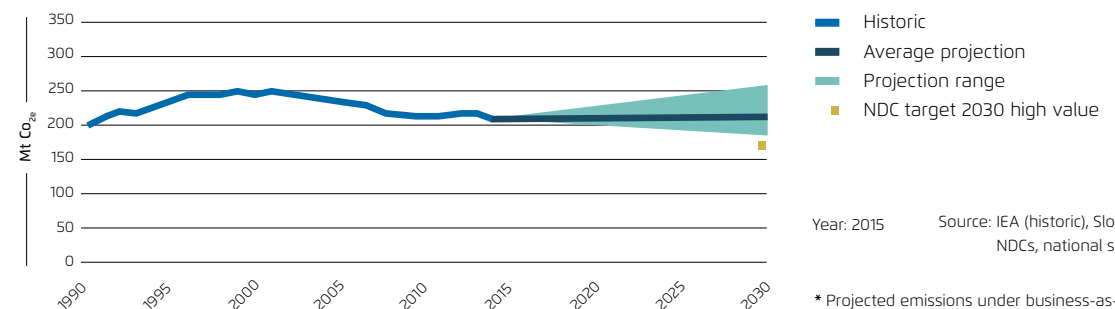
Sources: IEA, UNDESA, SloCaT

Transport emissions by subsector



Year: 2015 Source: IEA

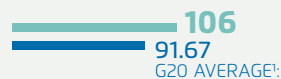
Historic and projected* emissions in the transport sector



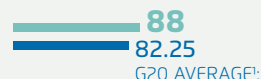


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

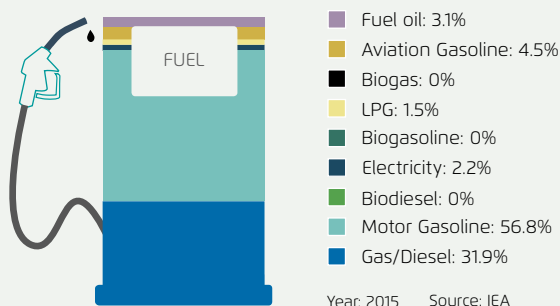


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



Year: 2015 Source: IEA

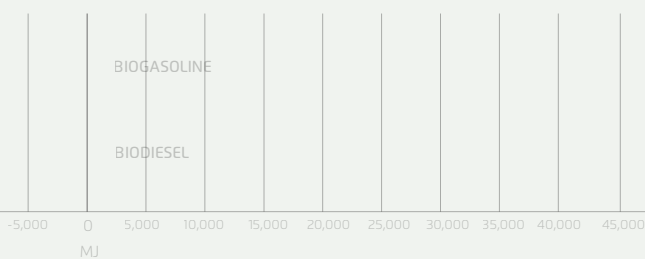
SHARE OF BIOFUELS IMPORTED (2015)

0%



No Data (Biofuel supply and use*)

■ Production ■ Exports ■ Imports ■ Use in Transport



* Excluding biogas, as this is mostly used in other sectors

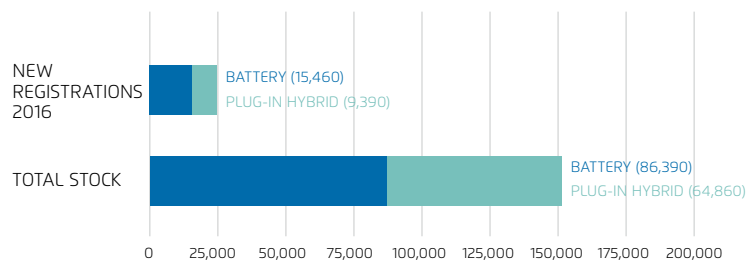
Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)

NEW REGISTRATIONS OF ELECTRIC CARS (2016)



Year: 2016

MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2015)

0.59%

SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2015)

16.4%

NO DATA (SHARE OF ELECTRIC CARS IN TOTAL PASSENGER CAR STOCK)

%

PUBLICLY ACCESS- IBLE CHARGE INFRASTRUCTURE (2015)

■ 17,260 *
SLOW CHARGE

■ 5,990 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: IEA EV Outlook 2017

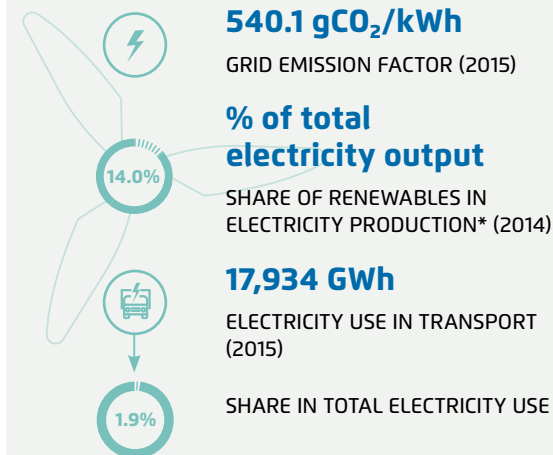
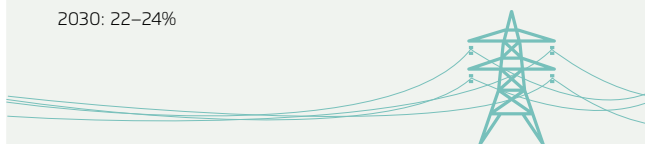


LINKAGES TO THE ENERGY SECTOR

Non-renewable electricity in Japan is mostly generated using natural gas (40%), coal (33%) and oil (10%). Nuclear power generation is negligible since the shut-down of plants following Fukushima. Japan has operated a feed-in tariff (FIT) since 2012 that is differentiated by technology. Guaranteed price levels have decreased over time. In April 2017 Japan introduced a reverse auction system for large-scale PV projects.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources
2030: 22–24%



* Including hydropower

Sources: IEA, World Development Indicators



AMBITION

NDC target

Committed to a 26% reduction in GHG emissions in 2030 compared to 2013

Transport related target

Transport sector emissions 27% below 2013 (163 Mt CO₂) by 2030

Transport related measures

Improvement in fuel efficiency of cars
Next-generation automobiles
Eco-friendly ship transport
Improve energy consumption efficiency of aviation and railways
Intelligent Transport Systems (ITS)
Automatic driving, eco-driving, car sharing
Optimization of truck transport
Promotion of public transport
Modal shift to rail

Targets at national level

Japan does not have a specific national emission target for the transport sector, but the 2016 Plan for Global Warming Countermeasures introduces a target of 50% to 70% for the market share of next-generation low-emission vehicles in new automobile sales in 2030.

Source: NDC, Energy Policies of IEA Countries. Japan. 2016 Review



TRADE-OFF'S

Sustainability of biofuels

In the "Act on Sophisticated Methods of Energy Supply Structures" of 2010, the GOJ established an environmental sustainability standard for biofuels that required that bioethanol not compete with the food supply, and that biofuels reduce greenhouse gas (GHG) emissions by at least 50 percent from the emissions of gasoline, based on a life cycle assessment (LCA).

Source: USDA

Subsidies

66 Billion yen

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Energy prices are not regulated in Japan, and there are no direct consumer subsidies. There are, however, a number of schemes to support the exploration, extraction and refining of oil products, aiming to ensure power system reliability. As oil is also used in electricity generation, not all of these subsidies can be directly allocated to the transport sector.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Low Carbon City Act (Eco-City Act) requires local governments to develop Low-Carbon Development Plans plans and promote the use of public transportation
✓ Measures to support low-carbon freight logistics	Green Logistics Partnership Improving the user-friendliness of railways and coastal shipping Improving distribution system efficiency through improved truck transport and improved port terminal facilities Promoting voluntary measures to improve truck transport and undertake modal shifts (from trucks to railways)
National-level measures to support new mobility services	<i>No measures at national level</i>
National measures to support non-motorized transport	<i>No specific measures</i>
✓ Road charges	Tolls apply to most expressways in Japan

Energy

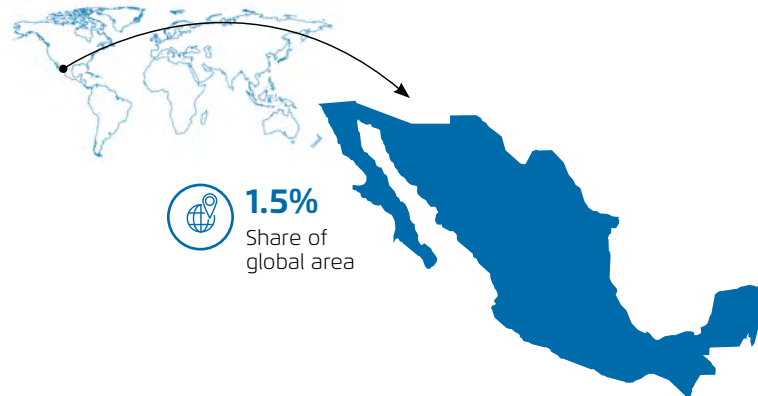
✓ Energy/carbon emission standards LDV	Fuel efficiency target 2020: 20.3 km/L
✓ Energy/carbon emission standards HDV	Top runner
✓ Pricing instruments	Eco-Car Tax Break and Subsidies for taxes on tonnage, acquisition, and ownership, based on fuel efficiency and type of vehicle. Hybrids, plug-in hybrid electric, electric, fuel cell, clean diesel, and natural gas vehicles qualify for tax breaks. Carbon tax from 2012–2016
✓ Mandatory vehicle labelling	Fuel Efficiency Labelling System
✓ Support mechanism for electric vehicles & charging infrastructure	Battery capacity and electric range-based purchase subsidy
✓ Support for other low-carbon fuels and propulsion systems	Incentives for fuel cell vehicle buyers and HRS infrastructure Government purchase of Hydrogen Fuelled vehicles
Mandatory biofuel targets	<i>No national mandate. Japan has set a target of 800 Mt per year by 2018.</i>

Source: See national sources Japan

MEXICO

Most of the population of Mexico lives in the centre of the country, with a quarter of inhabitants living in the metropolitan area of Mexico City. Large parts of the country, particularly in the south, are mountainous and hard to access. Railways connect only major centres, and except for one touristic line are only used for freight transport. For passenger transport, buses are the main mode for intercity travel. Mexico has the third largest number of airports globally and air transport accounts for 1.7% of passengers transported (more than rail or navigation), with the rest falling to road transport. The focus on road transport is less pronounced in freight: just over half of freight tonnage is transported by road, followed by navigation, which accounts for almost one-third. Mexico faces a particular challenge related to its vehicle fleet, due to both an aging vehicle fleet and lagging vehicle efficiency and pollutant standards.

Mexico has no national or international target for the transport sector. Existing policy measures focus on expanding public transport infrastructure and vehicle efficiency, and there is limited support for low-carbon vehicles and fuels.



0.76 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



16,490 constant 2011 international \$ (PPP)

GDP PER CAPITA (2015)

1,000 \$



G20
AVERAGE:
18,379



WORLD
AVERAGE:
14,725



Source: 5th National Communication 2012 Mexico; BUR 2015 Mexico; CIA World Factbook; IEA Mexico Energy Outlook 2016

Sources: World Development Indicators



1.94%

SHARE IN GLOBAL GDP (2015)



POPULATION

127 mio people

POPULATION CURRENT
IN 2015

1.7%

SHARE IN GLOBAL
POPULATION IN 2015



URBANISATION

79.2% of total

URBAN POPULATION
IN 2015

74.86%

G20 AVERAGE¹

53.86%

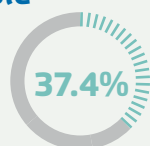
WORLD AVERAGE



47,566,382 people

POPULATION IN URBAN
AREAS OF > 1 MIO (2015)

SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

**195 Road motor
vehicles per 1,000
inhabitants**

MOTORISATION RATE
(2011)

1 = 100 Inhabitants

1 = 100 Motor Vehicles



No data
(passenger-km)

PASSENGER TRANSPORT
VOLUME*



**313,821 mio
tonne-km**

FREIGHT TRANSPORT
VOLUME** (2013)

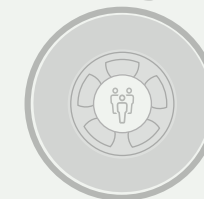


* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: Data for bus from 2013, ITF/OECD, World Development Indicators

No data
(Passenger-km per mode)



Tonne-km per mode



■ Road: 75%
■ Inland waterways: 0%
■ Rail: 25%
■ Pipeline: 0%
■ Domestic Air: 0%

Year: 2013

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

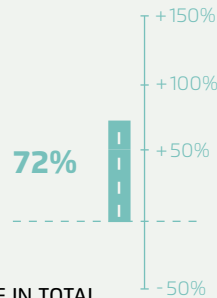


TOTAL EMISSIONS

Mexico's total CO₂ emissions from fuel combustion have increased by 72% since 1990, with transport sector emissions increasing by 80% over the same period and projected to increase between 27% and 112% by 2030 under business-as-usual. Transport is responsible for over a third of total emissions, 10% more than G20 average. Rail and domestic navigation play a minor role in sector emissions, with road causing almost 97% of emissions.

442.31 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2015)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2015)

3.48



G20 Average¹:
8.4



World Average:
5



t CO₂ per capita



SHARE IN GLOBAL EMISSIONS (2015)

1.37%

Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

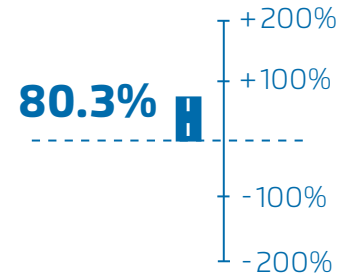


TRANSPORT SECTOR EMISSIONS

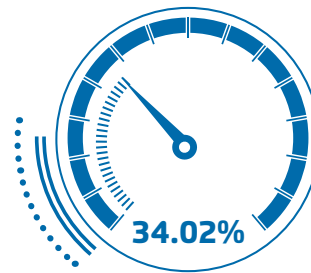
150.48 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2015)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015

1.18

G20 Average¹:
1.11

2030

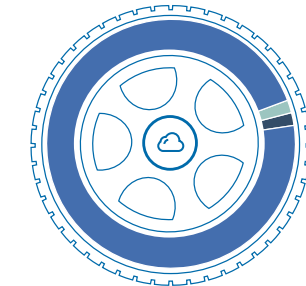
1.56

G20 Average¹:
2.33

t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

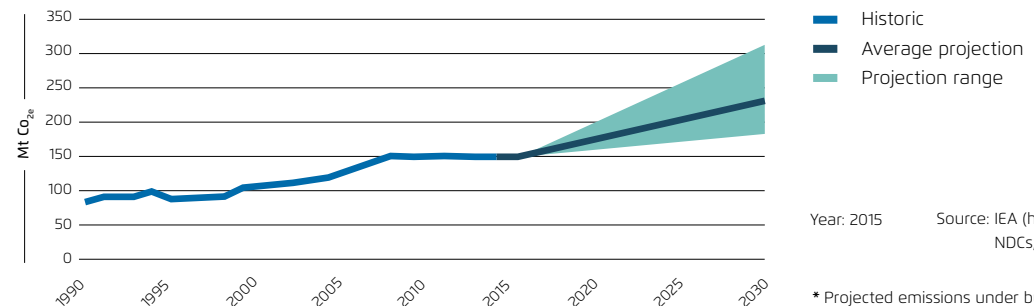
Transport emissions by subsector



Road: 96.6%
Rail: 1.7%
Domestic Navigation: 1.6%
Domestic Aviation: 0%
Pipeline: 0%
Non-specified: 0%

Year: 2015 Source: IEA

Historic and projected* emissions in the transport sector

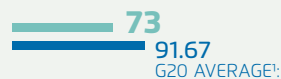


* Projected emissions under business-as-usual scenario

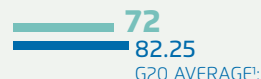


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

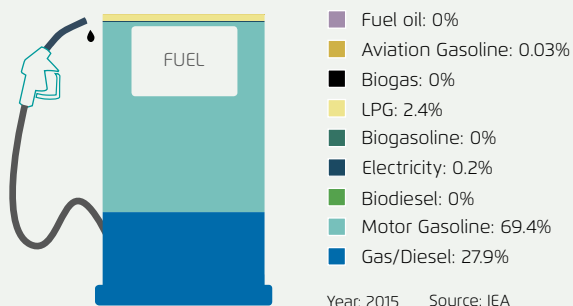


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



Year: 2015 Source: IEA

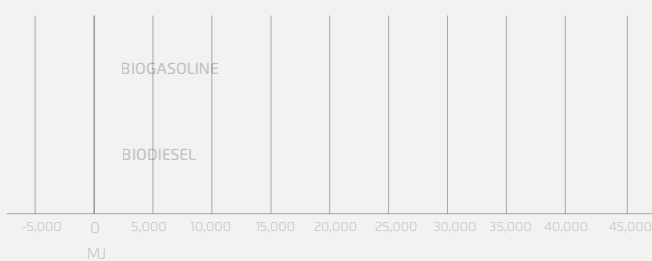
SHARE OF BIOFUELS IMPORTED (2015)

0%



No Data (Biofuel supply and use*)

■ Production ■ Exports ■ Imports ■ Use in Transport



* Excluding biogas, as this is mostly used in other sectors

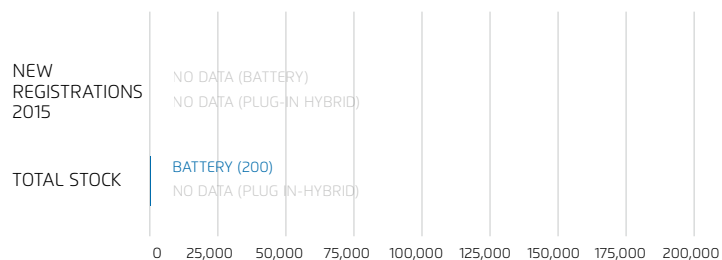
Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2015)

NEW REGISTRATIONS OF ELECTRIC CARS (2015)



Year: 2015

NO DATA (MARKET
SHARE OF ELECTRIC
CARS IN THE NATION-
AL MARKET)

%

NO DATA
(SHARE OF NEW
REGISTRATIONS IN
TOTAL EV STOCK)

%

NO DATA (SHARE OF
ELECTRIC CARS IN
TOTAL PASSENGER
CAR STOCK)

%

PUBLICLY ACCE-
SSIBLE CHARGE
INFRASTRUCTURE
(2015)

■ 150*
SLOW CHARGE

■ No data
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: BMW Green Transportation Working Paper



LINKAGES TO THE ENERGY SECTOR

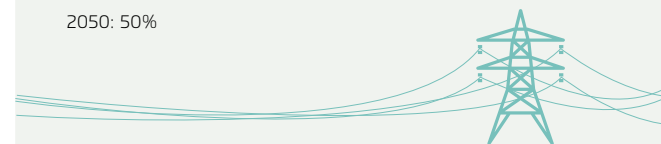
Mexico's targets for 2024 are to be met through a quota and a clean energy certificate (CEC) system. Starting in 2018, retail suppliers will be required to have a given share of their electricity from clean sources. In practice, they must buy CECs to demonstrate that they have complied with the quota obligation. This obligation is set on an annual base, and increases every year.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources

2024: 35%

2050: 50%



459.6 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

1,134 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators,
IEA Energy Policy Review Mexico 2017



AMBITION

NDC target

Committed to a 25% reduction in GHG emissions in 2030 compared to BAU, including 22% reduction in GHG emissions and a 51% reduction in Black Carbon by 2030. Conditional to international support, GHG emissions could be reduced by 36% and Black Carbon emissions by 70% by 2030.

Transport related target *No mention*

Transport related measures *No mention*

Targets at national level

18% of non-conditioned reduction of CO₂ and 83% reduction in black carbon should come from transport. A long term strategy outlines a qualitative vision for the next 10, 20 and 40 years.

Source: NDC, Mexico's Climate Change Mid-Century Strategy 2016, SEMARNAT 2015



TRADE-OFF'S

Sustainability of biofuels

According to the Bio-Fuels Promotion & Development Law (LPDP), biofuel production needs to respect food safety and sovereignty. The legislation also sets up a bio-fuel regulatory inter-agency mechanism, the Inter-Agency Bio-fuel Development Commission, which assign permits based on the amount of surplus corn production.

Source: USDA

Subsidies

63 Billion Mexican pesos

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Source: OECD

The federal government sets domestic prices for gasoline and diesel using excise taxes. There are also fuel-tax credits available for the agriculture and fishery sectors, for commercial vessels, passenger and cargo transportation, and for diesel used for purposes other than fuelling vehicles. In late 2014, Mexico eliminated the direct support it provided for the consumption of gasoline and diesel fuel through the IEPS, the country's floating excise tax, so total subsidies for the sector are expected to be substantially lower from 2015 onward.



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Federal Support Programme for Mass Transit (PROTRAM), with a focus on mass transit, specifically BRTs, LRTs, metros and suburban rail systems
✓ Measures to support low-carbon freight logistics	Transporte Limpio
National-level measures to support new mobility services	<i>No measures at national level</i>
National measures to support non-motorized transport	<i>No measures at national level</i>
✓ Road charges	Tolls apply on major highways and for many inner-city highways

Energy

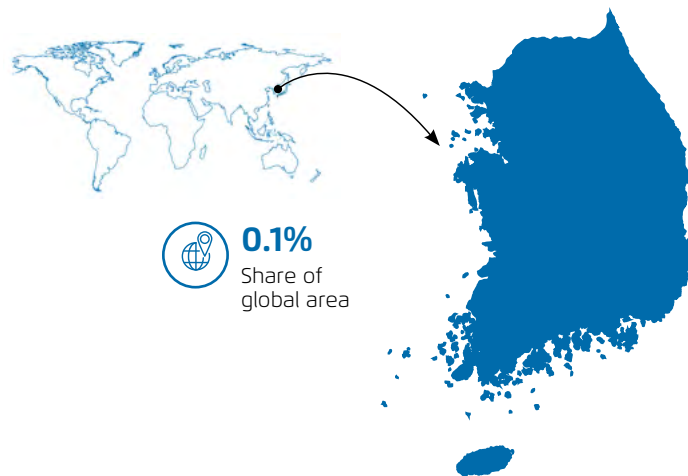
✓ Energy/carbon emission standards LDV	Target 2016: 34.4 mpg or 160 g/km
Energy/carbon emission standards HDV	<i>No standard</i>
✓ Pricing instruments	Carbon tax on fossil fuels (except natural gas) of USD 3.5 per tCO ₂
Mandatory vehicle labelling	<i>No mandatory labelling</i>
✓ Support mechanism for electric vehicles & charging infrastructure	Government-led electric taxi programs in Mexico City and Aguascalientes Program to develop charging infrastructure in several large cities
✓ Support for other low-carbon fuels and propulsion systems	Bio-Fuels Promotion & Development Law
✓ Mandatory biofuel targets	Mexico recently introduced a mandatory share of 5.8% for bioethanol.

Source: See national sources Mexico

REPUBLIC OF KOREA

South Korea lies on the southern half of the Korean Peninsula, bordering both the Sea of Japan and the Yellow Sea. Seventy per cent of the country is mountainous, and the population is primarily concentrated in lowland areas, where urban density is quite high. Gyeonggi Province in the northwest, which surrounds the capital of Seoul and contains the port of Incheon, is the most densely populated province. With some 82% of the population living in urban areas, subway transport captures an unusually large share of passenger transport (8%). South Korea boasts a well-developed railway system, including a number of high-speed trains that have diverted travel from air to rail (while also inducing additional travel demand). The high-speed rail system is undergoing expansion and should cover 82% of the country by 2020.

As part of its Low Carbon, Green Growth vision, the transport sector is expected to slash GHG emissions by 34.3% below BAU by 2020, making transport the sector to provide the greatest emission reductions. This goal is supported by measures in nearly all relevant areas, with the exception of road pricing or energy/CO₂ efficiency standards for heavy-duty vehicles.



0.1%
Share of
global area

100,280 km²
TOTAL AREA (2016)

519.26 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



0.90 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



WORLD AVERAGE: 0.72

Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



34,387 constant 2011 international \$ (PPP)

GDP PER CAPITA (2015)

1,000 \$



G20
AVERAGE:
18,379



WORLD
AVERAGE:
14,725



1.61%

SHARE IN GLOBAL GDP (2015)



Source: BUR 2014 Korea; CIA World Factbook; KOTI 2015

Sources: World Development Indicators



POPULATION

50.6 mio people

POPULATION CURRENT
IN 2015

0.7%

SHARE IN GLOBAL
POPULATION IN 2015



URBANISATION

82% of total

URBAN POPULATION
IN 2015

74.86%

G20 AVERAGE¹

53.86%

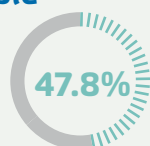
WORLD AVERAGE



24,204,894 people

POPULATION IN URBAN
AREAS OF > 1 MIO (2015)

SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

**284 road motor
vehicles per 1000
inhabitants**

MOTORISATION RATE
(2011)

1 = 100 Inhabitants

1 = 100 Motor Vehicles



**No data
(passenger-km)**

PASSENGER TRANSPORT
VOLUME*

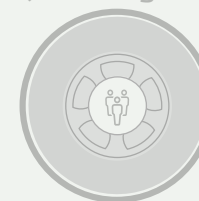


**No data
(tonne-km)**

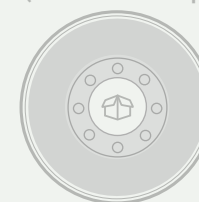
FREIGHT TRANSPORT
VOLUME**



**No data
(Passenger-km per mode)**



**No data
(Tonne-km per mode)**



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: Federal Bureau of Statistics, Germany

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

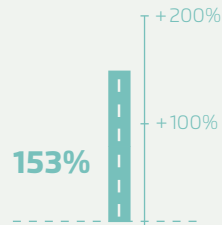


TOTAL EMISSIONS

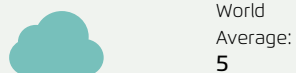
Total CO₂ emissions from fuel combustion in the Republic of Korea have increased by 153% since 1990, with the transport sector growing a bit more slowly, registering a 122% increase over the same period. Per capita emissions from the transport sector are almost at the G20 average, while total per capita emissions are almost 40% above the G20 average. Road transport is by far the main contributor, with a 94% share, followed by aviation (4.7%) and rail (1.5%), the majority of which is from electricity use.

585.99 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2015)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2015)



t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990–2015)



SHARE IN GLOBAL EMISSIONS (2015)

1.81%

Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

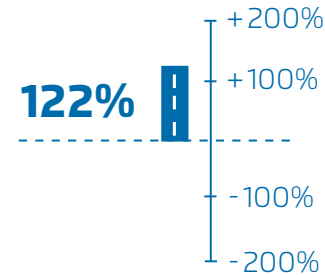


TRANSPORT SECTOR EMISSIONS

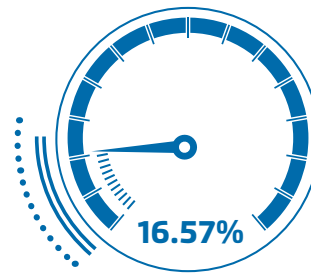
97.07 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2015)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015



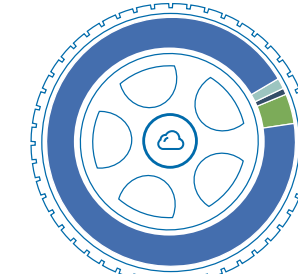
2030



t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

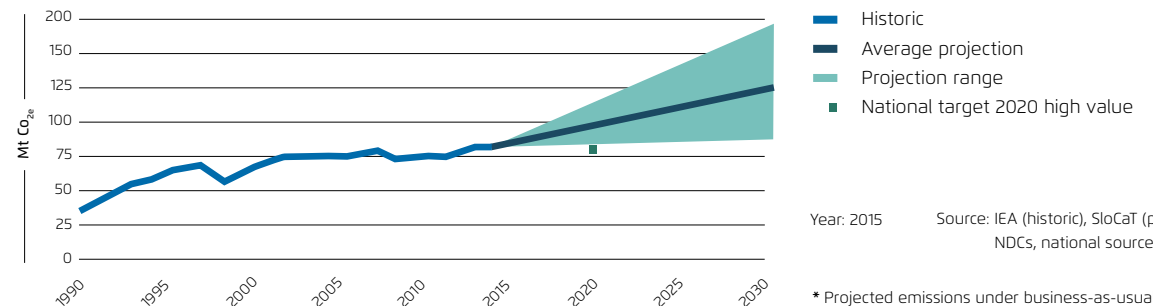
Transport emissions by subsector



Road: 94%
Rail: 1.5%
Domestic Navigation: 0.7%
Domestic Aviation: 3.7%
Pipeline: 0%
Non-specified: 0%

Year: 2015 Source: IEA

Historic and projected* emissions in the transport sector

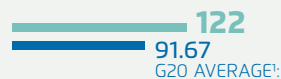


* Projected emissions under business-as-usual scenario

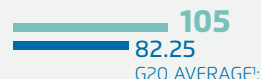


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

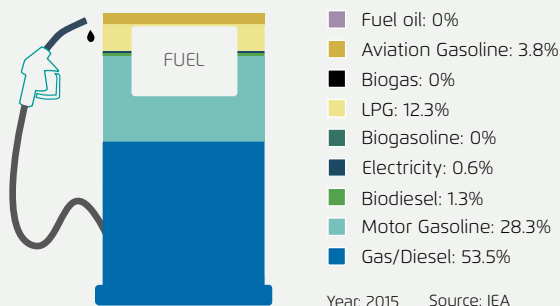


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



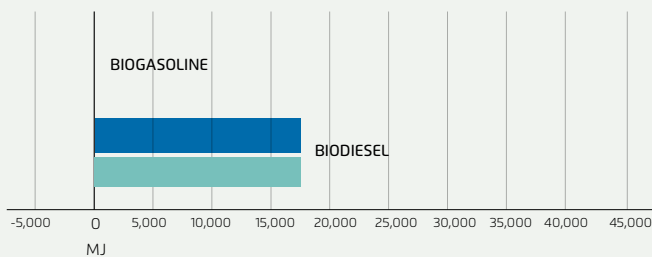
Year: 2015 Source: IEA

SHARE OF BIOFUELS IMPORTED (2015)



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



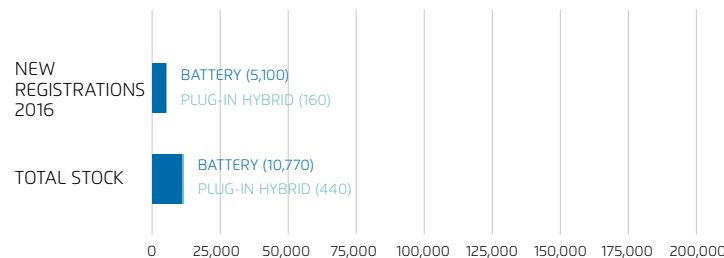
* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



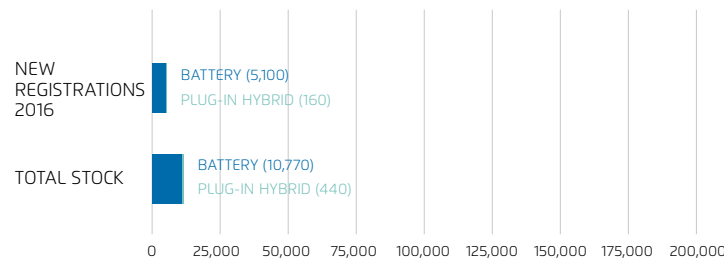
ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)



Year: 2016

NEW REGISTRATIONS OF ELECTRIC CARS (2016)



MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2016)

0.34%

SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2016)

46.9%

PUBLICLY ACCESSIBLE CHARGE INFRASTRUCTURE (2016)

1,075*
SLOW CHARGE

750*
FAST CHARGE

13,969*
SLOW CHARGE
G20 AVERAGE¹

13,295*
FAST CHARGE
G20 AVERAGE¹

* number of units

NO DATA (SHARE OF ELECTRIC CARS IN TOTAL PASSENGER CAR STOCK)

%

Source: IEA EV Outlook 2017



LINKAGES TO THE ENERGY SECTOR

The main energy sources for power generation in South Korea are coal (43%), nuclear power (30%) and natural gas (22%). In January 2012 the Renewable Portfolio Standard (RPS) replaced the existing feed-in tariff system in order to accelerate Korea's renewable energy deployment and create a competitive market environment for the sector. The RPS programme requires the 13 largest power companies to steadily increase the share of power generation from renewables up to 2024.

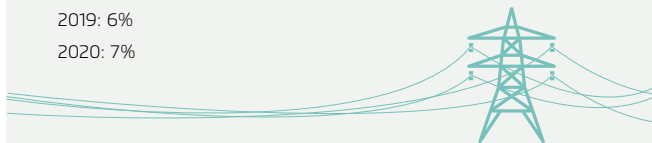
Existing targets for renewable electricity generation

Share of electricity generation from renewable sources

2018: 5%

2019: 6%

2020: 7%



526.4 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

1.6%

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

2,217 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

0.4%

SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators



AMBITION

NDC target

Committed to a 37% reduction in GHG emissions in 2030 compared to BAU

Transport related target

No mention

Transport related measures

Strengthen the average emission standard from 140g/km in 2015 to 97g/km in 2020
Create incentives, including tax reductions, for electric and hybrid vehicles
Expand infrastructure for environmentally friendly public transport

Targets at national level

As part of its Low Carbon, Green Growth vision, the transport sector is expected to reduce GHG emissions by 34.3% below BAU by 2020, providing the largest sectoral reduction to contribute to the overall national target.

Additionally, the government announced to take steps to make clean vehicles account for 30% of all vehicles by 2020.

Source: NDC, BUR 2014; Asian NGV Communications



TRADE-OFF'S

Sustainability of biofuels

No measures to ensure the sustainability of biofuels could be identified.

Subsidies

1.197 Billion won

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Source: OECD

The bulk of support for the consumption of fossil fuels in South Korea can be attributed to the tax exemptions for fuels used in the agriculture and fishery sectors.



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Public Transportation Master Plan Expansion of high-speed rail system Nation-wide unified fare-collection system
✓ Measures to support low-carbon freight logistics	Green and Smart Transport Partnership Multi-Modal Transit Center Development Master Plan Intelligent Transportation System Master Plan Sustainable National Transport and Logistics Master Plan Testing and a certification system for green ship technology
✓ National-level measures to support new mobility services	Bike-share mostly introduced and operated with budgetary support from the government
✓ National measures to support non-motorized transport	Korean Bicycle Master Plan Master Plan for the National Bike roads Network New Town Bicycle Project
Road charges	<i>No national road charging schemes only Area charging schemes (traffic congestion pricing in Seoul)</i>

Energy

✓ Energy/carbon emission standards LDV	Target 2020: 24 km/L or 97 gCO ₂ /km
Energy/carbon emission standards HDV	<i>No standard</i>
✓ Pricing instruments	Traffic/Energy/Environment Tax on gasoline and fuels
✓ Mandatory vehicle labelling	Rational Energy Utilization Act
✓ Support mechanism for electric vehicles & charging infrastructure	Central purchase subsidies for EVs Tax reductions
✓ Support for other low-carbon fuels and propulsion systems	Promotion of natural gas for buses (subsidies and low priced natural gas)
✓ Mandatory biofuel targets	South Korea has a mandatory share of 2.5% for biofuels, scheduled to increase to 3% in 2018.

Source: See national sources Korea

RUSSIAN FEDERATION

Russia is the world's largest country by area. Its population is heavily concentrated to the west of the Urals. Large parts of Siberia are permanently covered in permafrost. The density of transport infrastructure varies significantly by region. It is densest in the European part of Russia, while some parts of Siberia and the Far East lack good transport access, which is an important barrier to economic development. One-third of all rural settlements are still not connected to the paved road network. While Russia has inherited an extensive state-owned railway system, investment has not kept up with maintenance needs or increasing freight transport demand. The majority of roads are not suitable for heavy vehicles: less than 30% of federal and regional roads are designed to handle standard modern axle loads of 10 tonnes or more. As a result, the road transport share is relatively low, with the majority of freight being transported by rail. Buses, including in particular private minibuses, are the main mode of transport, with rail capturing most of the remaining share.

Russia does not have a specific targets for the transport sector. Measures to promote efficiency are very limited in all areas.

Source: OECD Economic Department 2015; ITF/OECD



12.7%
Share of
global area

17,098,250 km²
TOTAL AREA (2016)

8.80 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



0.80 HDI*
HUMAN DEVELOPMENT INDEX* IN 2015



WORLD AVERAGE: 0.72

Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



24,124 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

1,000 \$



G20
AVERAGE:
18,379



WORLD
AVERAGE:
14,725



3.26%
SHARE IN GLOBAL GDP (2015)



POPULATION

144.1 mio people
POPULATION CURRENT
IN 2015

2.0%
SHARE IN GLOBAL
POPULATION IN 2015

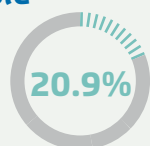


URBANISATION

74.0% of total
URBAN POPULATION
IN 2015
74.86%
G20 AVERAGE¹
53.86%
WORLD AVERAGE



30,090,188 people
POPULATION IN URBAN
AREAS OF > 1 MIO (2015)
20.9%
SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

233 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE
(2009)

100 Inhabitants
100 Motor Vehicles



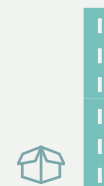
247,267 mio passenger-km

PASSENGER TRANSPORT
VOLUME* (2015)



3,875,415 mio tonne-km

FREIGHT TRANSPORT
VOLUME** (2015)



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators, Federal Bureau of Statistics - Germany

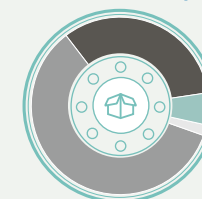
Passenger-km per mode



Road, Car: 0%
Road, Bus: 51%
Rail: 49%

Year: 2015

Tonne-km per mode



Road: 6%
Inland waterways: 2%
Rail: 59%
Pipeline: 33%
Domestic Air: 0%

Year: 2015

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting



TOTAL EMISSIONS

Total CO₂ emissions from fuel combustion in the Russian Federation have decreased by 32% since 1990, with the transport sector only decreasing by 20% over the same period. The share of transport emissions in total emissions is low compared to G20 average, although total per capita emissions are well above G20 average. Transport sector emissions are characterised by large emissions from pipeline operations, representing a quarter of the sector's emissions, and rail plays an important role, generating 9% of total sector emissions, the highest share in the G20. With just under 56%, road transport has the lowest share in total sector emissions within the G20.

1,467.55 Mt CO₂



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2014)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2014)



10.18



G20 Average¹:
8.4



World Average:
5

t CO₂ per capita



SHARE IN GLOBAL EMISSIONS (2014)

4.53%

Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

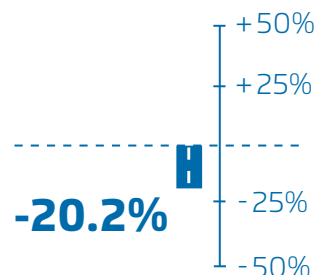


TRANSPORT SECTOR EMISSIONS

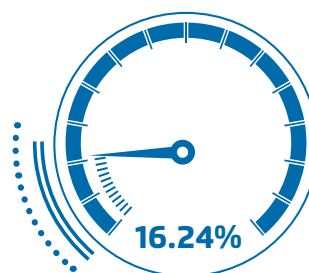
238.40 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2014)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2014)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2014)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2014/2030)



2015



1.65



G20 Average¹:
1.11

2030



2.17

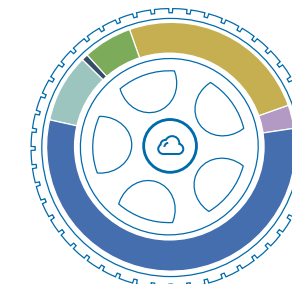


G20 Average¹:
2.33

t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

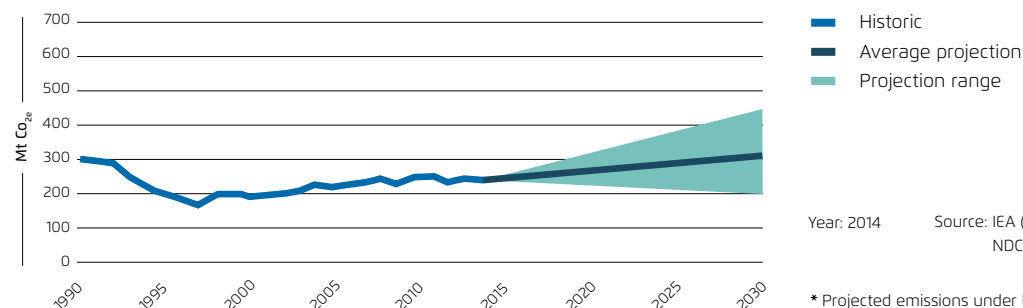
Transport emissions by subsector



Road: 55.9%
Rail: 9.1%
Domestic Navigation: 0.8%
Domestic Aviation: 6.3%
Pipeline: 25.2%
Non-specified: 2.8%

Year: 2014 Source: IEA

Historic and projected* emissions in the transport sector





ENERGY

US Cents/Litre GASOLINE PRICE (2016)

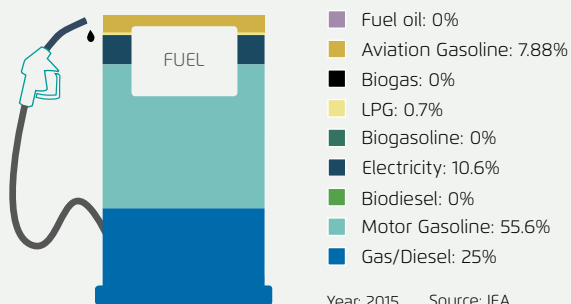


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



Year: 2015 Source: IEA

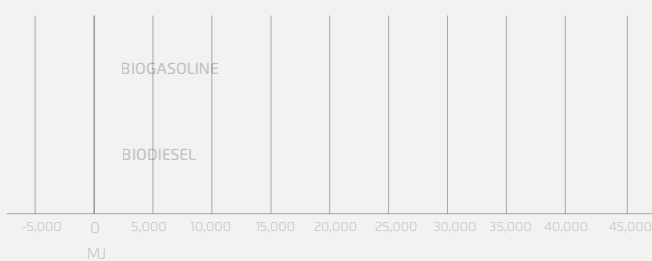
SHARE OF BIOFUELS IMPORTED (2015)

0%



No Data (Biofuel supply and use*)

■ Production ■ Exports ■ Imports ■ Use in Transport



* Excluding biogas, as this is mostly used in other sectors

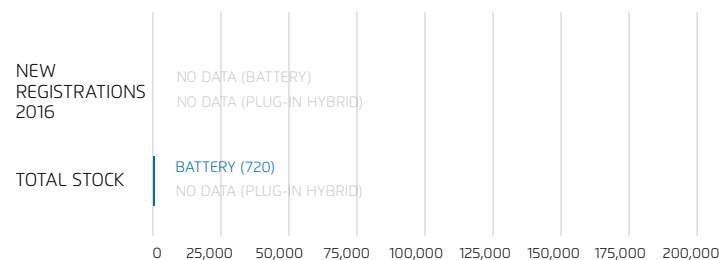
Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)

NEW REGISTRATIONS OF ELECTRIC CARS (2016)



Year: 2016

NO DATA (MARKET
SHARE OF ELECTRIC
CARS IN THE NATION-
AL MARKET)

%

NO DATA
(SHARE OF NEW
REGISTRATIONS IN
TOTAL EV STOCK)

%

NO DATA (SHARE OF
ELECTRIC CARS IN
TOTAL PASSENGER
CAR STOCK)

%

PUBLICLY ACCE-
SSIBLE CHARGE
INFRASTRUCTURE
(2016)

■ 120*
SLOW CHARGE

■ No data
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: Euroasia Network



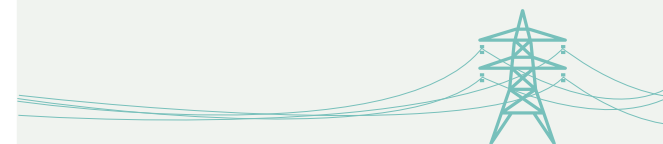
LINKAGES TO THE ENERGY SECTOR

Around half of Russia's electricity is generated using natural gas, with nuclear and coal providing the majority of the remaining generation. The main support mechanism for renewable energy is a capacity auction system that guarantees capacity payments over 15 years. Various other measures were adopted in 2009 to promote renewables, including a 5% renewables quota for power loss compensation, and coverage of grid connection costs.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources
(excluding hydro >25 MW)

2020: 4.5% (excluding hydro >25 MW); 20% (including hydro)



395.0 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

16,6%

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

82,120 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

11,3%

SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators,
IRENA REmap Russia 2017



AMBITION

NDC target

Committed to a 25–30% reduction in GHG emissions in 2030 compared to 1990, provided maximum estimate of absorbing capacity of forests is taken into account

Transport related target *No mention*

Transport related measures *No mention*

Targets at national level

The Transport Strategy of the Russian Federation does not set mandatory targets, but the measures aim to reduce specific carbon dioxide emissions in road transport by 20–22% by 2030, and by 50–51% in rail transport compared to 1990 levels.

Source: NDC, BR 2016



TRADE-OFF'S

Sustainability of biofuels

No focus on supporting biofuels, subsequently no measures to ensure sustainability.

Source: USDA

Subsidies

179 billion Russian rubles

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Source: OECD

Prices for petroleum products are deregulated and set by the market, although in practice the government often intervenes to limit price increases, most notably through the use of export taxes. The producers of oil and natural gas such as Rosneft, Gazprom and LUKOIL attract the largest share of all support for fossil fuels, primarily through partial or full exemptions from the federal extraction tax, only part of which applies to the transport sector.



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Transport Strategy (2014) includes expansion of public transport infrastructure and services including high speed rail
✓ Measures to support low-carbon freight logistics	Transport Strategy (2014) includes expansion of transport hubs, upgrade and expansion of railway cargo fleet, among others
National-level measures to support new mobility services	<i>No measures at national level</i>
National measures to support non-motorized transport	<i>No measures at national level</i>
✓ Road charges	„Platon“, a road charging system for trucks introduced in 2015, charges all trucks over 12 tonnes when driven on federal highways

Energy

Energy/carbon emission standards LDV	<i>No standard</i>
Energy/carbon emission standards HDV	<i>No standard</i>
✓ Pricing instruments	The vehicle registration tax increases with vehicle and engine size, as well as CO ₂ emissions.
Mandatory vehicle labelling	<i>No mandatory labelling</i>
Support mechanism for electric vehicles & charging infrastructure	<i>No measures at national level</i>
✓ Support for other low-carbon fuels and propulsion systems	Incentives for the development of CNG and LNG refuelling infrastructure and pilots with natural gas vehicles
Mandatory biofuel targets	<i>No requirements or targets are in place. The transport strategy assumes that the share of all alternative fuels will increase from 4% in 2011 to 17–20% by 2020.</i>

Source: See national sources Russian Federation

SAUDI ARABIA

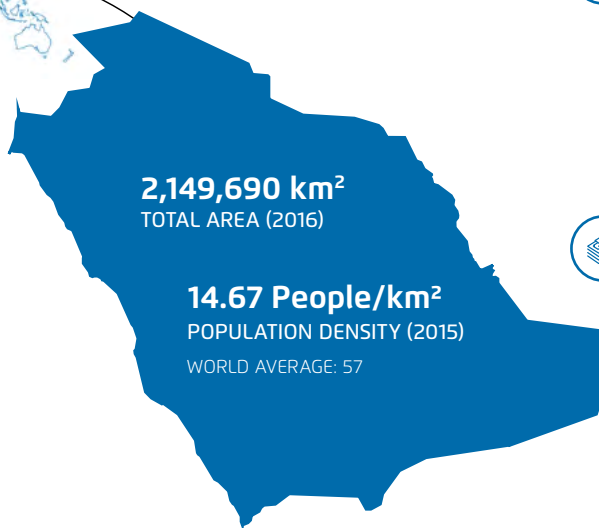
Most of Saudi Arabia's population is concentrated in a wide band across the middle of the peninsula. Saudi Arabia does not have any rivers, but does have good access to maritime shipping, with extensive coastlines in the Persian Gulf and Red Sea. Road transport is the most important mode of transport, and the country is rapidly motorising, with 760,000 vehicles imported annually.

The Kingdom does not have specific targets for the transport sector, but in recent years it has started to expand public transport and rail infrastructure, and has also implemented a fuel efficiency standard for light duty vehicles. Few measures have been enacted to support a modal shift or low-carbon vehicles.

Source: 3rd National Communication; CIA World Factbook



1.6%
Share of
global area



Sources: World Development Indicators



0.85 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



50,284 constant 2011 international \$ (PPP)

GDP PER CAPITA (2015)

1,000 \$



G20
AVERAGE:
18,379



WORLD
AVERAGE:
14,725



1.47%

SHARE IN GLOBAL GDP (2015)



POPULATION

31.5 mio people

POPULATION CURRENT
IN 2015

0.4%

SHARE IN GLOBAL
POPULATION IN 2015

Source: World Development Indicators



URBANISATION

83.1% of total

URBAN POPULATION
IN 2015

74.86%

G20 AVERAGE¹

53.86%

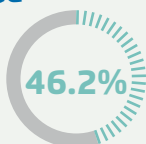
WORLD AVERAGE



14,560,779 people

POPULATION IN URBAN
AREAS OF > 1 MIO (2015)

SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators



MOBILITY

**133 road motor
vehicles per 1,000
inhabitants**

MOTORISATION RATE
(2005)

1 = 100 Inhabitants

1 = 100 Motor Vehicles



No data
(passenger-km)

PASSENGER TRANSPORT
VOLUME*



No data
(tonne-km)

FREIGHT TRANSPORT
VOLUME**



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

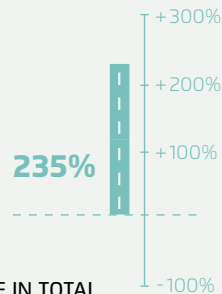


TOTAL EMISSIONS

Total CO₂ emissions from fuel combustion in Saudi Arabia have increased by 235% since 1990, with the transport sector growing a bit more slowly with an increase of 166% over the same period. Per capita emissions are the highest in the G20 for total emissions and the third highest for transport emissions. The emission profile in the transport sector is unusual, with no reported emissions for rail, aviation or navigation and road transport generating 98% of sector emissions.

506.59 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2014)



TOTAL CO₂ EMISSIONS PER CAPITA (2014)



G20 Average¹: 8.4

World Average: 5

t CO₂ per capita



SHARE IN GLOBAL EMISSIONS (2014)

1.56%

Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

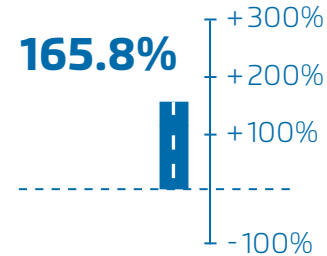


TRANSPORT SECTOR EMISSIONS

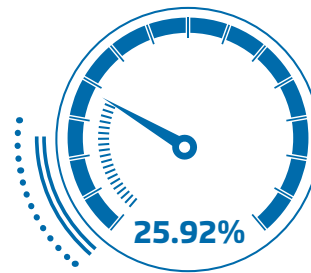
131.30 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2014)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2014)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2014)



World Average: 23%

G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015

4.16

2030

3.55

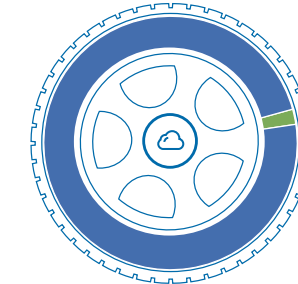
t CO₂ per capita

G20 Average¹: 1.11

G20 Average¹: 2.33

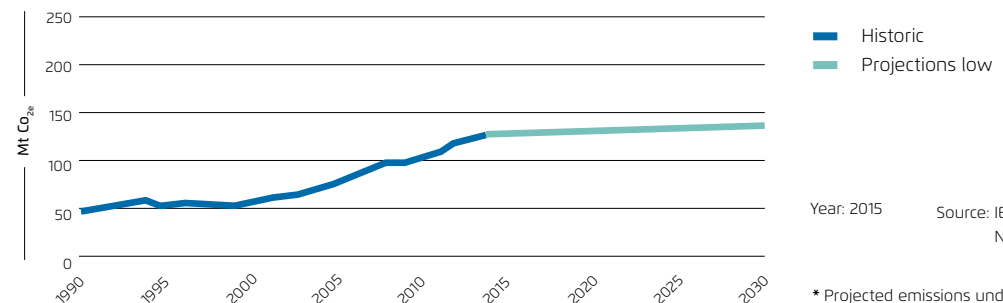
Sources: IEA, UNDESA, SloCaT

Transport emissions by subsector



Year: 2014 Source: IEA

Historic and projected* emissions in the transport sector



* Projected emissions under business-as-usual scenario



ENERGY

US Cents/Litre

GASOLINE PRICE (2016)



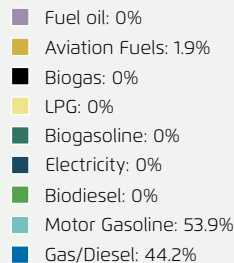
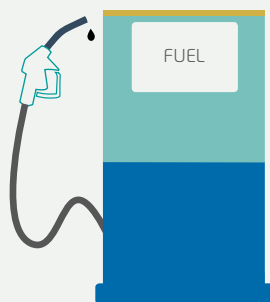
US Cents/Litre

DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



Year: 2015 Source: IEA

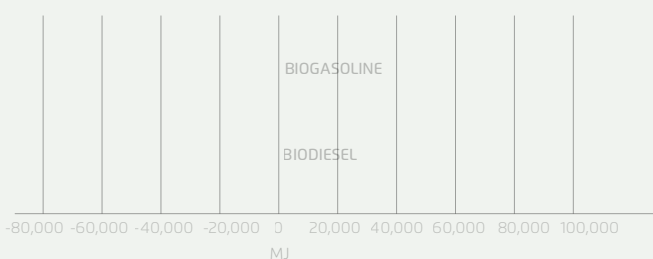
%



NO DATA
(SHARE OF BIOFUELS IMPORTED)

No Data (Biofuel supply and use)*

■ Production ■ Exports ■ Imports ■ Use in Transport



* Excluding biogas, as this is mostly used in other sectors



ELECTRIC VEHICLES

NO DATA
(TOTAL STOCK OF
ELECTRIC CARS)

NO DATA
(NEW REGISTRATIONS OF
ELECTRIC CARS)

NEW
REGISTRATIONS
2016

NO DATA (BATTERY)
NO DATA (PLUG-IN HYBRID)

TOTAL STOCK

NO DATA (BATTERY)
NO DATA (PLUG-IN HYBRID)

0 100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000

Year: 2016

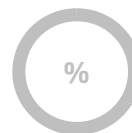
NO DATA (MARKET
SHARE OF ELECTRIC
CARS IN THE NATION-
AL MARKET)

%



NO DATA
(SHARE OF NEW
REGISTRATIONS IN
TOTAL EV STOCK)

%



NO DATA (PUBLICLY
ACCESSIBLE
CHARGE INFRA-
STRUCTURE)

SLOW CHARGE

FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

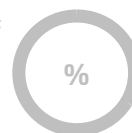
-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

20,000 units



NO DATA (SHARE OF
ELECTRIC CARS IN
TOTAL PASSENGER
CAR STOCK)

%



LINKAGES TO THE ENERGY SECTOR

Saudi Arabia mostly relies on natural gas and oil to generate electricity. However, the country aims to expand its renewables base with an initial target of 3.45 GW by 2020 that will involve three rounds of tendering for wind, solar PV, concentrated solar power (CSP) and waste-to-energy technology. Development of a further 6.05 GW is targeted by 2023.

Existing targets for renewable electricity generation

By 2032:

- 25 GW of CSP
- 16 GW of solar PV
- 9 GW of wind
- 3 GW of waste-to-energy
- 1 GW of geothermal



726.2 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

NO DATA (ELECTRICITY USE IN
TRANSPORT)

NO DATA (SHARE IN TOTAL
ELECTRICITY USE)

* Including hydropower

Sources: IEA, World Development Indicators,
Kingdom of Saudi Arabia



AMBITION

NDC target

Committed to an annual reduction of 130 MtCO_{2e} in 2030 compared to BAU

Transport related target

No mention

Transport related measures

Introduction of efficiency standards in the transport sector
Promotion of development and use of mass transport systems in urban areas

Targets at national level

Saudi Arabia does not have transport specific national targets, although the „Vision 2030“ sets out qualitative objectives to increase usage of public transportation and improve efficiency of railways.

Source: NDC, 3rd National Communication; Vision 2030



TRADE-OFF'S

Sustainability of biofuels

No mandates or support mechanisms in place and very limited use of biofuels. No sustainability regulation in place.

Source: reegle

Subsidies

49.3 Billion real 2013 USD

LEVEL OF FOSSIL FUEL
SUBSIDIES IN THE TRANS-
PORT SECTOR (2014)

No further information is available.

Source: IEA Consumption subsidies



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	The Kingdom established the Public Transport Authority (PTA) in 2012 and allocated 200 Billion Saudi Riyals for public transport projects and for regulating the public transport services within and between cities. Saudi Railway Master Plan Public transport projects in all major cities
✓ Measures to support low-carbon freight logistics	North-South Railway (NSR) project Saudi Railway Master Plan
National-level measures to support new mobility services	<i>No measures at national level</i>
National measures to support non-motorized transport	<i>No measures at national level</i>
Road charges	<i>No toll system</i>

Energy

✓ Energy/carbon emission standards LDV	2016–2020 Passenger cars: 10.3 km/liter Light commercial: 9.0 km/liter
Energy/carbon emission standards HDV	<i>No standard</i>
Pricing instruments	<i>No CO₂ or energy consumption based taxes</i>
✓ Mandatory vehicle labelling	Fuel Economy Labelling Requirements
Support mechanism for electric vehicles & charging infrastructure	<i>No measures at national level</i>
Support for other low-carbon fuels and propulsion systems	<i>No measures at national level</i>
Mandatory biofuel targets	<i>No requirements or targets are in place.</i>

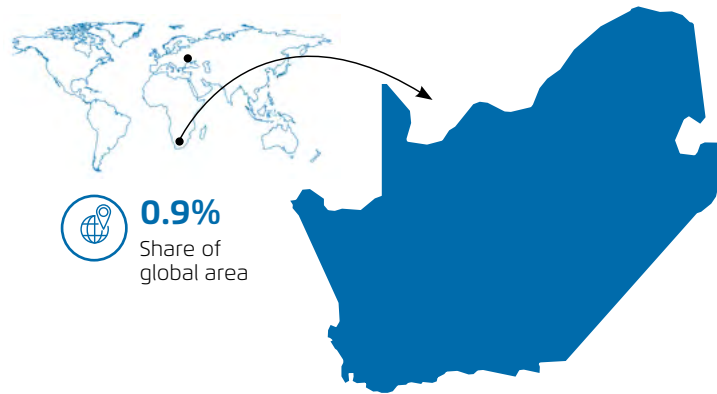
Source: See national sources Saudi Arabia

SOUTH AFRICA

South Africa's transport sector is dominated by road travel, but the country has good port and rail infrastructure and a growing airline industry. The country is the most urbanised in Africa, with nearly two-thirds of the population living in urban areas. Domestic travel patterns are characterised by large distances between places of residence and employment, and low-density urban development. South Africa has a higher than world average car ownership ratio, which can be attributed partly to the historical legacy of low-density spatial planning. Nonetheless, 60% of all human transport is by foot or bicycle, with remaining shares of 37% for road and 2.5% for rail. Some major metropolitan areas are adopting Bus Rapid Transport (BRT) systems along the most centralised and congested routes, and the state-subsidised Metrorail system transports an average of 1.7 million passengers each working day.

The National Energy Efficiency Strategy 2005 set a national energy intensity target of 12% by 2015, with the transport sector slated to account for a 9% improvement in intensity relative to a 2000 baseline. The draft post-2015 revision of the strategy includes a 20% reduction in average vehicle energy intensity (MJ/km) by 2030, relative to a 2015 baseline, but has not yet been approved.

Source: 2nd National Communication 2011 South Africa; BUR 2014; CIA World Factbook



0.9%
Share of
global area

1,219,090 km²
TOTAL AREA (2016)

45.35 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



0.67 HDI*
HUMAN DEVELOPMENT INDEX* IN 2015



WORLD AVERAGE: 0.72

Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



12,393 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

1,000 \$



G20
AVERAGE:
18,379



WORLD
AVERAGE:
14,725



0.63%
SHARE IN GLOBAL GDP (2015)



POPULATION

55 mio people
POPULATION CURRENT
IN 2015

0.8%
SHARE IN GLOBAL
POPULATION IN 2015

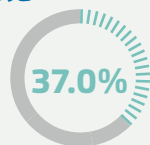


URBANISATION

64.8% of total
URBAN POPULATION
IN 2015
74.86%
G20 AVERAGE¹
53.86%
WORLD AVERAGE



20,352,730 people
POPULATION IN URBAN
AREAS OF > 1 MIO (2015)
37.0%
SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

**120 road motor
vehicles per 1,000
inhabitants**

MOTORISATION RATE
(2014)

1 person = 100 Inhabitants
1 car = 100 Motor Vehicles



**266,389 mio
passenger-km**

PASSENGER TRANSPORT
VOLUME* (2014)



No Data
(mio tonne-km)
FREIGHT TRANSPORT
VOLUME**



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF Outlook 2017, World Development Indicators; ERC 2012

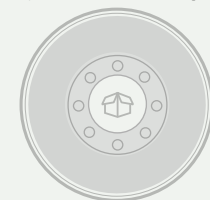
Passenger-km per mode



■ Road, Car: 45%
■ Road, Bus: 50%
■ Rail: 5%

Year: 2014

No data
(Tonne-km per mode)



¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

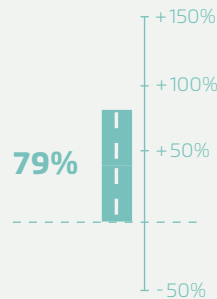


TOTAL EMISSIONS

South Africa's total CO₂ emissions from fuel combustion have increased by 79% since 1990, with transport sector emissions increasing at the same rate. Emissions from the sector are projected grow between 47% and 148% by 2030. Some 5.6% of sector emissions are from rail transport and aviation has grown in importance in recent years, now representing just over 5% of sector emissions. Transport sector emissions represent only 12% of national emissions, which is only half the G20 average. This can be explained by the high carbon intensity of the power sector, which dominates South Africa's emissions profile.

437.37 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2014)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2014)

7.95



G20 Average¹:
8.4



World Average:
5



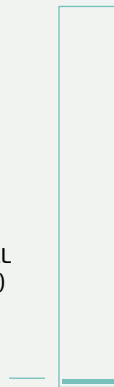
t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990-2014)



SHARE IN GLOBAL EMISSIONS (2014)

1.35%



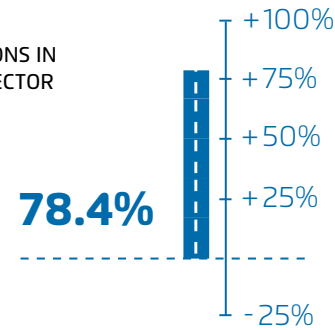
Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion



TRANSPORT SECTOR EMISSIONS

52.70 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2014)



CHANGE IN TRANSPORT SECTOR EMISSIONS (1990-2014)

SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2014)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2014/2030)



2015

0.96



G20 Average¹:
1.11

2030

1.70

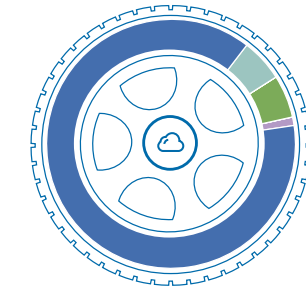


G20 Average¹:
2.33

t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

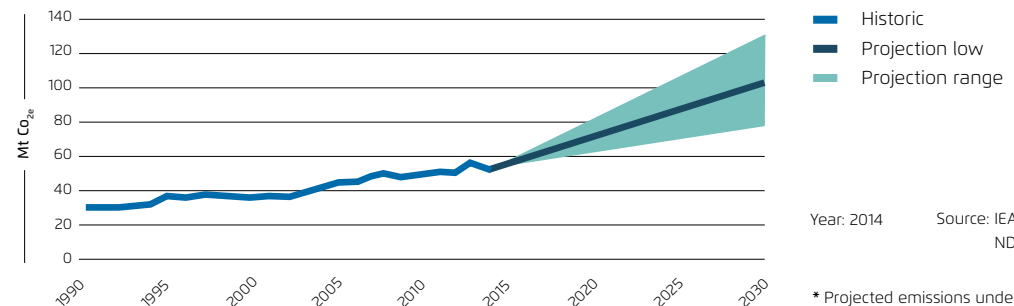
Transport emissions by subsector



Road: 87.7%
Rail: 5.6%
Domestic Navigation: 0.2%
Domestic Aviation: 5.4%
Pipeline: 0.1%
Non-specified: 0.9%

Year: 2014 Source: IEA

Historic and projected* emissions in the transport sector

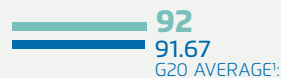


* Projected emissions under business-as-usual scenario



ENERGY

US Cents/Litre GASOLINE PRICE (2016)

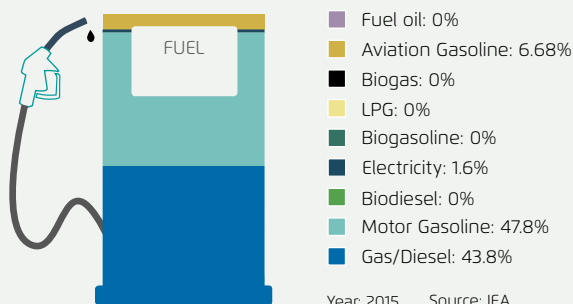


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



Year: 2015 Source: IEA

0%

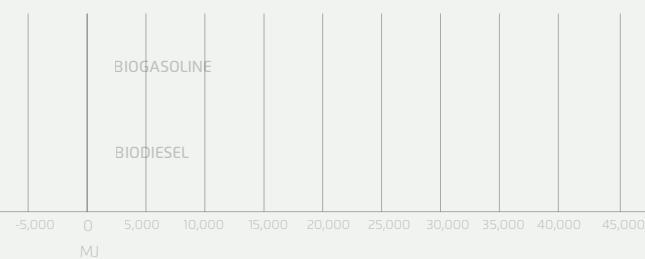


SHARE OF BIOFUELS IMPORTED (2015)



No Data (Biofuel supply and use*)

■ Production ■ Exports ■ Imports ■ Use in Transport



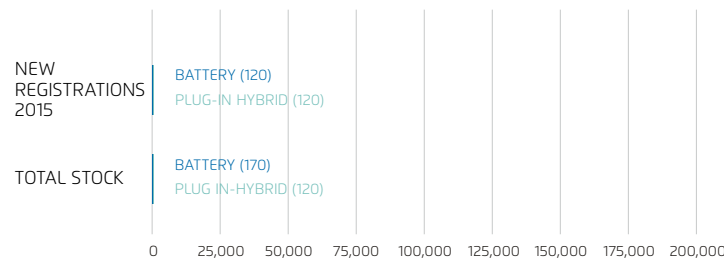
* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2015)



Year: 2015

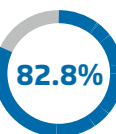
NEW REGISTRATIONS OF ELECTRIC CARS (2015)

MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2015)

1.41%



SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2015)



PUBLICLY ACCESSIBLE CHARGE INFRASTRUCTURE (2015)

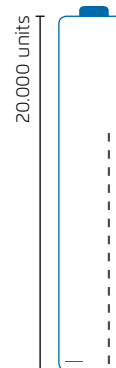
■ 10*
SLOW CHARGE

■ No data
FAST CHARGE

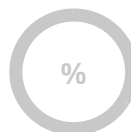
-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units



NO DATA (SHARE OF ELECTRIC CARS IN TOTAL PASSENGER CAR STOCK)



Source: IEA EV Outlook 2016



LINKAGES TO THE ENERGY SECTOR

Coal is the dominant fuel source for power generation in South Africa, representing 93% of generation (global average: 39%). Between 2009 and 2011, a feed-in tariff was the main policy mechanism for promoting renewable energy. The tariff was replaced by a competitive bidding process, known as REIPPP, in 2011. Between 2011 and 2015, reverse auctions were held for the construction of 3,625 MW of renewable energy capacity.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources
2030: 9%



990.3 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total electricity output

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

3,447 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators, IPP Renewables



AMBITION

NDC target

South Africa's peak, plateau and decline GHG emissions trajectory range commits to emissions by 2025 and 2030 in a range between 398 and 614 Mt CO_{2e}

Transport related target 20% of hybrid-electric vehicles by 2030

Transport related measures Integrate electric and hybrid vehicles

Targets at national level

The National Energy Efficiency Strategy 2005 set a national energy intensity target of 12% by 2015, with the transport sector contributing with a 9% improvement in intensity relative to a 2000 baseline. The draft post-2015 revision of the strategy includes a 20% reduction in average vehicle energy intensity (MJ/km) by 2030, relative to a 2015 baseline.

Source: NDC, Department of Energy



TRADE-OFF'S

Sustainability of biofuels

A Biofuels Feedstock Protocol is currently under consideration that aims to address food security concerns to safeguard the switching from production of food to biofuels feedstock. Among the conditions in the Protocol is the use of idle land for commercial and small-scale feedstock production under rain-fed conditions. Furthermore, the use of maize and potatoes for biofuel production would be prohibited, as well as deforestation for the purpose of feedstock production.

Source: Departement of Energy 2015 South Africa

Subsidies

21 Billion South African rand

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Diesel fuel is exempt from the VAT normally levied on sales of most products in South Africa (14% in the case of energy products). Since 2000, consumers of diesel fuel in specific sectors, including agriculture and forestry, have additionally been refunded a certain percentage of the fuel levy and road accident levy.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	The Transport Flagship Programme will develop an enhanced public transport programme to promote lower-carbon mobility The Integrated Public Transport Network aims at the integration of urban public transport
Measures to support low-carbon freight logistics	<i>No measures at national level</i>
National-level measures to support new mobility services	<i>No measures at national level</i>
National measures to support non-motorized transport	<i>No measures at national level</i> <i>In 2008 a draft non-motorised transport policy was published, but not approved</i>
✓ Road charges	Tolls apply to around 20% of public roads

Energy

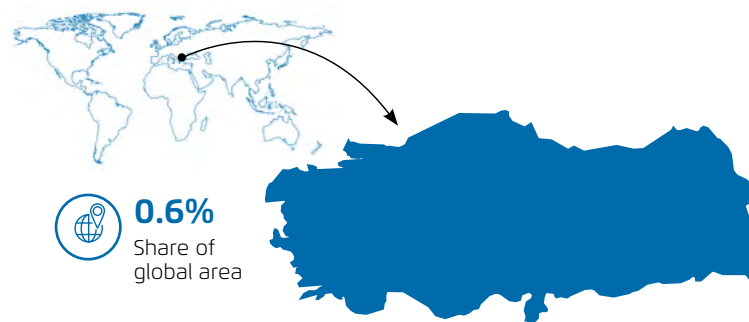
Energy/carbon emission standards LDV	<i>No standard</i>
Energy/carbon emission standards HDV	<i>No standard</i>
Pricing instruments	<i>Registration tax based on CO₂</i> <i>Carbon tax under discussion</i>
✓ Mandatory vehicle labelling	South African Fuel Economy Label
Support mechanism for electric vehicles & charging infrastructure	<i>No measures at national level</i>
Support for other low-carbon fuels and propulsion systems	<i>No measures at national level</i>
✓ Mandatory biofuel targets	South Africa has mandatory shares of 2% for bioethanol and 5% for biodiesel.

Source: See national sources South Africa

TURKEY

Turkey is located between the Black Sea and the Mediterranean. The most densely populated area is found around the Bosphorus in the northwest, with 20% of the population living in Istanbul. With the exception of Ankara, urban centers remain small and scattered throughout the interior of Anatolia. The majority of transport is road-based, with diesel playing a major role and LPG having an uncharacteristically high share in sector fuel use. International aviation is playing an important role in the tourism sector, but domestic aviation has also seen substantial growth for passenger and freight transport.

Turkey's Climate Change Action Plan 2011–2023 sets targets for increasing the share of rail and navigation in passenger and freight transport. The strategies developed thus far focus predominantly on achieving this modal shift, meaning few measures are in place to encourage vehicle efficiency or low-carbon alternatives.



785,350 km²
TOTAL AREA (2016)

102.21 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



0.77 HDI*

HUMAN DEVELOPMENT INDEX* IN 2015



Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



19,460 constant 2011 international \$ (PPP)

GDP PER CAPITA (2015)

1,000 \$



G20 AVERAGE:
18,379



WORLD AVERAGE:
14,725



1.42%

SHARE IN GLOBAL GDP (2015)



Source: 6th National Communication; CIA World Factbook

Sources: World Development Indicators



POPULATION

78.7 mio people

POPULATION CURRENT
IN 2015

1.1%

SHARE IN GLOBAL
POPULATION IN 2015



URBANISATION

73.4% of total

URBAN POPULATION
IN 2015

74.86%

G20 AVERAGE¹

53.86%

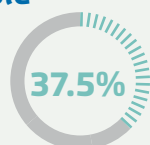
WORLD AVERAGE



29,501,580 people

POPULATION IN URBAN
AREAS OF > 1 MIO (2015)

SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

215 Road motor vehicles per 1,000 inhabitants

MOTORISATION RATE
(2014)

1 = 100 Inhabitants

1 = 100 Motor Vehicles



295,562 mio passenger-km

PASSENGER TRANSPORT
VOLUME* (2015)



310,199 mio tonne-km

FREIGHT TRANSPORT
VOLUME** (2015)

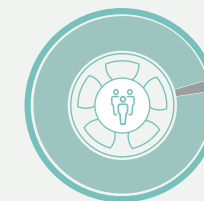


* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators

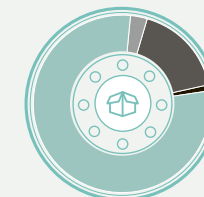
Passenger-km per mode



■ Road, Car: 98%
■ Road, Bus: 0%
■ Rail: 2%

Year: 2015

Tonne-km per mode



■ Road: 79%
■ Inland waterways: 0%
■ Rail: 3%
■ Pipeline: 17%
■ Domestic Air: 1%

Year: 2015

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

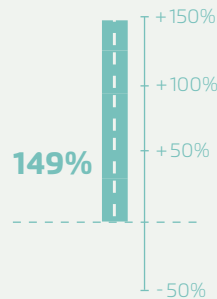


TOTAL EMISSIONS

Turkey's total CO₂ emissions from fuel combustion have increased by 149% since 1990, but per capita emissions are still around half of the G20 average and below the global average. Transport sector emissions have increased by 160% over the same period and are projected to grow a further 76% by 2030. Road transport and aviation together represent almost 97% of sector emissions, with rail, pipeline transport and navigation contributing 1% each.

317.22 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2014)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2015)

4.03



G20 Average¹:
8.4



World Average:
5



t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990–2015)



SHARE IN GLOBAL EMISSIONS (2015)

0.98%

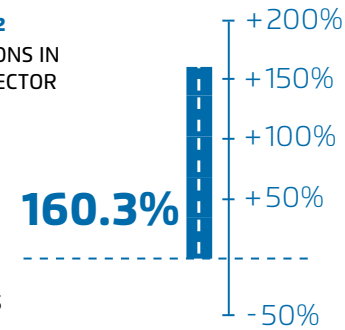
Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion



TRANSPORT SECTOR EMISSIONS

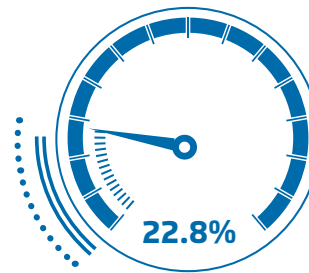
72.48 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)



CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2015)

SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015

0.92



G20 Average¹:
1.11

2030

1.45

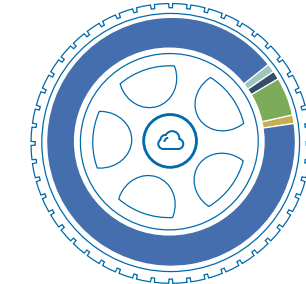


G20 Average¹:
2.33

t CO₂ per capita

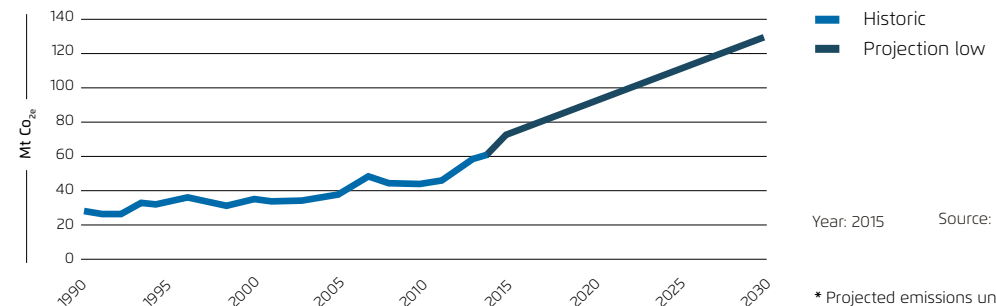
Sources: IEA, UNDESA, SloCaT

Transport emissions by subsector



Year: 2014 Source: IEA

Historic and projected* emissions in the transport sector

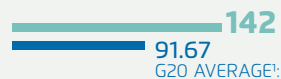


* Projected emissions under business-as-usual scenario

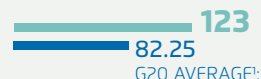


ENERGY

US Cents/Litre GASOLINE PRICE (2016)

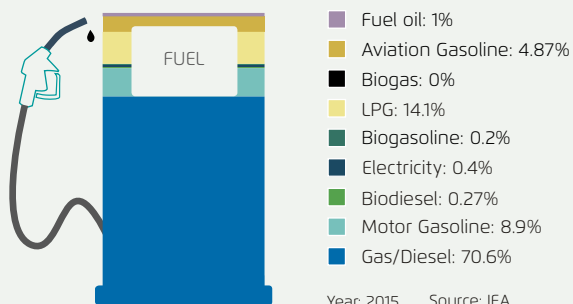


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



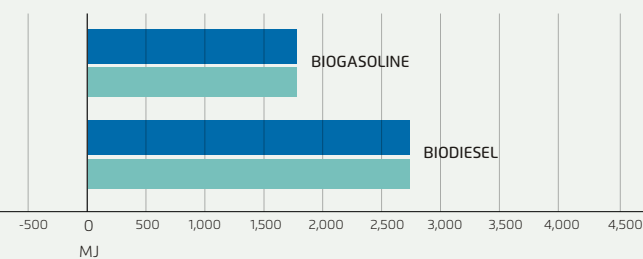
SHARE OF BIOFUELS IMPORTED (2015)

0%



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



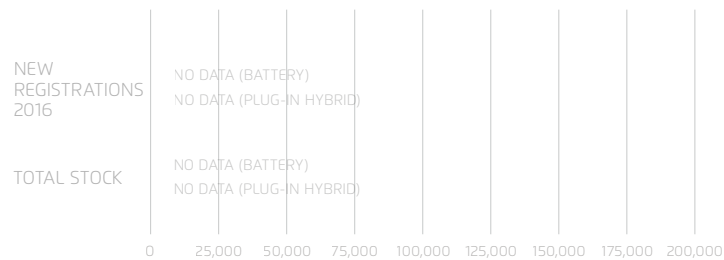
* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)



NEW REGISTRATIONS OF ELECTRIC CARS (2016)

NO DATA (MARKET
SHARE OF ELECTRIC
CARS IN THE NATION-
AL MARKET)

%

NO DATA
(SHARE OF NEW
REGISTRATIONS IN
TOTAL EV STOCK)

%

NO DATA (SHARE OF
ELECTRIC CARS IN
TOTAL PASSENGER
CAR STOCK)

%

PUBLICLY ACCE-
SSIBLE CHARGE
INFRASTRUCTURE
(2016)

■ 200*
SLOW CHARGE

■ No data
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: Electric Vehicle-Mobility in Turkey

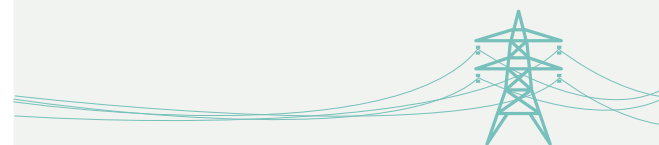


LINKAGES TO THE ENERGY SECTOR

Non-renewable electricity in Turkey is mostly generated using natural gas (38%) and coal (29%). In Turkey, renewable electricity production is mainly promoted through a guaranteed feed-in tariff. The feed-in tariff is limited to 10 years.

Existing targets for renewable electricity generation

Share of electricity generation from renewable sources
2023: 30%



441.1 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

20,9%
SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

1,062 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

0,5%
SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators,
RES LEGAL Europe; Global Legal Insights



AMBITION

NDC target

Committed up to 21% reduction in GHG emissions in 2030 compared to BAU

Transport related target

No mention

Transport related measures

Ensuring modal shift from road to maritime and rail
Enhancing combined transport
Implementing sustainable transport approaches in urban areas
Promotion of alternative fuels and clean vehicles
Reducing fuel consumption and emissions of road transport
Realizing high speed railway projects
Increasing urban railway systems
Achieving fuel savings by tunnel projects
Scraping of old vehicles from traffic
Implementing green port and green airport projects to ensure energy efficiency
Implementing special consumption tax exemptions for maritime transport

Targets at national level

The Climate Change Action Plan 2011-2023 sets out the following targets:

- Increasing the share of railroads in freight transportation from 5% in 2009 to 15%, and in passenger transportation from 2% in 2009 to 10% by 2023,
- Increasing the share of seaways in freight transportation from 2.6% of tonne-kilometres in 2009 to 10%, and in passenger transportation from 0.37% of passenger-kilometres in 2009 to 4%, and
- Decreasing the share of highways in freight transportation from 80% of tonne-kilometres in 2009 to below 60%, and in passenger transportation from 90% of passenger-kilometres in 2009 to 72%.

Source: NDC, Climate Change Action Plan 2011-2023



TRADE-OFF'S

Sustainability of biofuels

No measures to ensure sustainability of biofuels were found.

Subsidies

1 Billion Turkish lira

LEVEL OF FOSSIL FUEL
SUBSIDIES IN THE TRANS-
PORT SECTOR (2014)

The bulk of support for fossil fuels in the transport sector in Turkey comes from a compensation mechanism for diesel used in agriculture, to compensate farmers for the high excise tax.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	2012 EE Strategy and Climate Change Action Plan to develop efficient transport systems and to increase the share of maritime and rail transport
✓ Measures to support low-carbon freight logistics	
National-level measures to support new mobility services	<i>No measures at national level</i>
✓ National measures to support non-motorized transport	Climate Change Action Plan to develop and improve bicycle and pedestrian transport
✓ Road charges	Toll charges on selected motorways and bridges

Energy

Energy/carbon emission standards LDV	<i>No standard</i>
Energy/carbon emission standards HDV	<i>No standard</i>
Pricing instruments	<i>No CO₂ or energy consumption based taxes</i>
✓ Mandatory vehicle labelling	Energy Label similar to EU regulation
✓ Support mechanism for electric vehicles & charging infrastructure	Reduced special consumption tax for electric vehicles
Support for other low-carbon fuels and propulsion systems	<i>No measures at national level</i>
✓ Mandatory biofuel targets	Turkey has a mandatory 2% share for bioethanol.

Source: See national sources Turkey

UNITED KINGDOM

In the UK a large share of the population lives in and around London, but significant urban clusters are also located in central Britain, the Scottish lowlands, southern Wales, and the east of Northern Ireland. The UK is connected to mainland Europe via the Channel Tunnel, and also lies along important sea lanes. Road transport is the most important mode of passenger and freight transport, although domestic navigation accounts for a significant share of freight (nearly one-third).

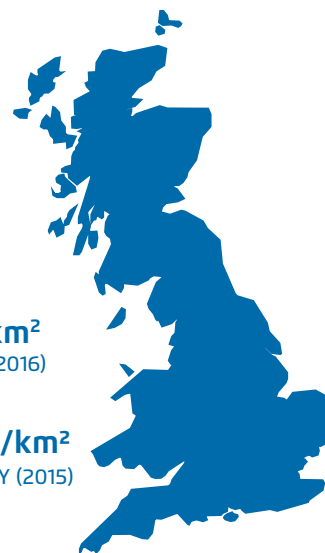
The UK has a national target to reduce GHG emissions from transport by 17–28% below 2009 levels by 2027. There are also ambitions to replace the existing vehicle fleet with zero-carbon vehicles by 2050.



0.2%
Share of global area

243,610 km²
TOTAL AREA (2016)

269.21 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



0.91 HDI*
HUMAN DEVELOPMENT INDEX* IN 2015



WORLD AVERAGE: 0.72

Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



38,509 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

1,000 \$



G20
AVERAGE:
18,379



WORLD
AVERAGE:
14,725



2.32%
SHARE IN GLOBAL GDP (2015)



Source: 6th National Communication; BUR 2015 UK; CIA World Factbook

Sources: World Development Indicators, OECD



POPULATION

65.1 mio people
POPULATION CURRENT
IN 2015

0.9%
SHARE IN GLOBAL
POPULATION IN 2015

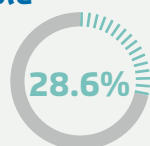


URBANISATION

82.6% of total
URBAN POPULATION
IN 2015
74.86%
G20 AVERAGE¹
53.86%
WORLD AVERAGE



18,608,949 people
POPULATION IN URBAN
AREAS OF > 1 MIO (2015)
28.6%
SHARE IN TOTAL
POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

577 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE
(2015)

1 person = 100 Inhabitants
1 car = 100 Motor Vehicles



755,602 mio passenger-km

PASSENGER TRANSPORT
VOLUME* (2014)



227,016 mio tonne-km

FREIGHT TRANSPORT
VOLUME** (2015)

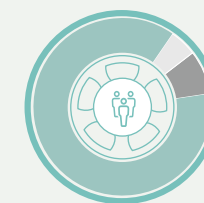


* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators, UK Department of Transport

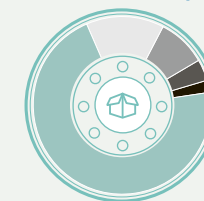
Passenger-km per mode



Road, Car: 87%
Road, Bus: 5%
Rail: 8%

Year: 2014

Tonne-km per mode



Road: 71%
Inland waterways: 14%
Rail: 9%
Pipeline: 4%
Domestic Air: 2%

Year: 2015

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

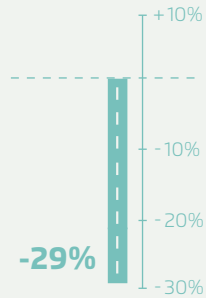


TOTAL EMISSIONS

Total CO₂ emissions from fuel combustion in the UK have decreased by 29% since 1990. Emissions in the transport sector have, however, increased by almost 3% in the same period. As a result, the transport sector is now responsible for almost a third of total emissions. Emissions from the sector increased between 1990 and 2007 and started declining afterwards. Since 2013 transport emissions have been rising again. Per capita emissions in the sector are well below the G20 average.

389.75 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2015)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2015)

5.98



G20 Average¹:
8.4



World Average:
5

t CO₂ per capita

CHANGE IN TOTAL EMISSIONS (1990–2015)



SHARE IN GLOBAL EMISSIONS (2015)

1.20%

Sources: UNFCCC, UNDESA, ITF/OECD

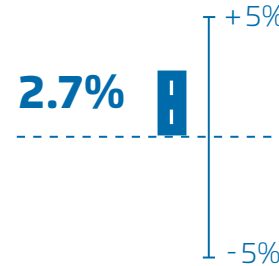


TRANSPORT SECTOR EMISSIONS

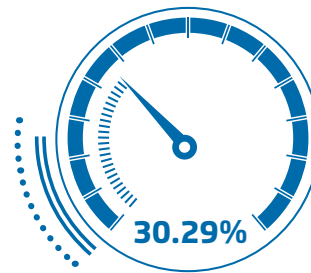
118.07 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990–2015)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015

1.81

2030

1.85

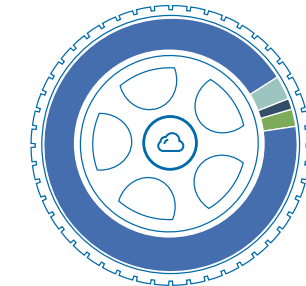
G20 Average¹:
1.11

G20 Average¹:
2.33

t CO₂ per capita

Sources: IEA, UNDESA, SloCaT

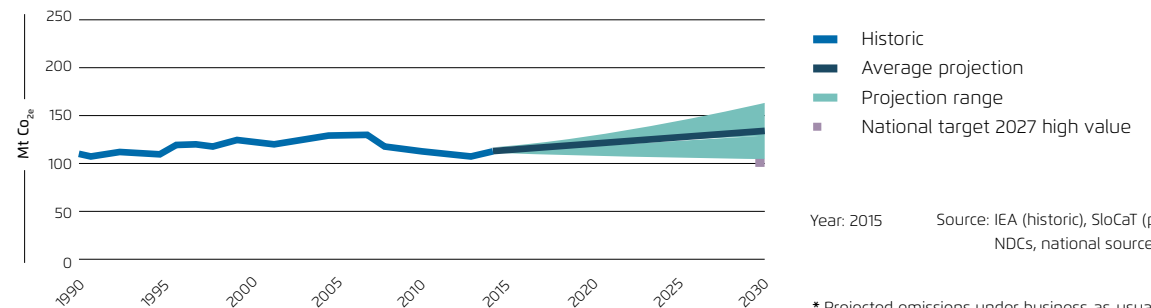
Transport emissions by subsector



Road: 93.4%
Rail: 2.9%
Domestic Navigation: 1.6%
Domestic Aviation: 2%
Pipeline: 0%
Non-specified: 0%

Year: 2015 Source: IEA

Historic and projected* emissions in the transport sector

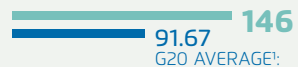


* Projected emissions under business-as-usual scenario



ENERGY

US Cents/Litre GASOLINE PRICE (2016)

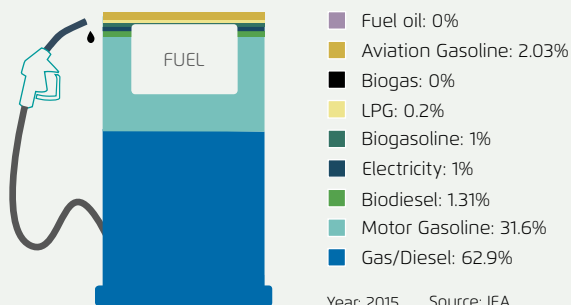


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



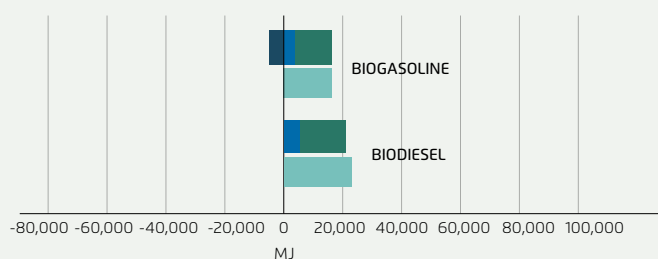
Year: 2015 Source: IEA

SHARE OF BIOFUELS IMPORTED (2015)



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



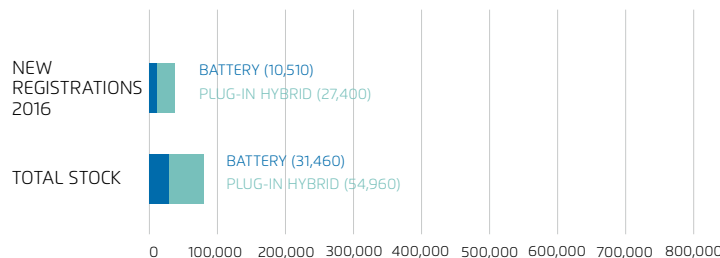
* Excluding biogas, as this is mostly used in other sectors

Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)



Year: 2016

NEW REGISTRATIONS OF ELECTRIC CARS (2016)

MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2016)

1.41%

SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2016)

43.9%

SHARE OF ELECTRIC CARS IN TOTAL PASSENGER CAR STOCK (2016)

0.29%

PUBLICLY ACCESSIBLE CHARGE INFRASTRUCTURE (2015)

■ 10,736 *
SLOW CHARGE

■ 1,523 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

Source: IEA EV Outlook



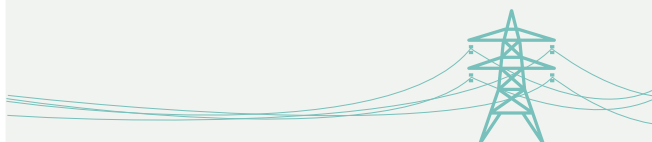
LINKAGES TO THE ENERGY SECTOR

Non-renewable electricity generation in the UK is almost evenly distributed between natural gas, coal and nuclear. Renewable electricity sources are supported through a number of different mechanisms: There is a feed-in tariff for plants up to 5 MW in size, and larger plants can benefit from the „Contracts for Difference“ scheme.

Renewables are also exempt from paying a tax that applies to fossil-fuel power generation.

Existing targets for renewable electricity generation

No national target, provincial target of 100% by 2020 in Scotland



348.7 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

19.4%
SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

4,476 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

1.5%
SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators, RES LEGAL Europe



AMBITION

NDC target

See EU: committed to a 40% reduction of GHG emissions in 2030 compared to 1990

Transport related target *no mention*

Transport related measures *no mention*

Targets at national level

The Carbon Plan from 2011 aims that transport emissions should be 17%–28% lower than 2009 levels by 2027.
Government ambition is for nearly all new cars and vans to be zero emission by 2040 and for almost every car and van on the road to be a zero emission vehicle by 2050.

Source: NDC, Grantham Research Institute; Clean Air Strategy 2017



TRADE-OFF'S

Sustainability of biofuels

The EU Renewable Energy Directive establishes two sets of criteria to promote the sustainability of biofuels production:

- GHG emissions savings and land use requirements must be at least 50% (60% for new installations in 2018), and
- biodiesel may not be produced on land that was converted from high carbon density conditions such as rainforests.

To demonstrate compliance with the EU sustainability criteria, biofuels need to be validated by national verification systems or by one of 20 voluntary schemes approved by the EC.

Source: European Commission

Subsidies

The UK does not subsidise end-user prices for transportation fuels. While several non-governmental research organisations have published estimates of UK government support for production, no data on production support are reported officially.



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	Local Sustainable Transport Fund provides funding to promote public transport
Measures to support low-carbon freight logistics	<i>No measures at national level</i>
National-level measures to support new mobility services	<i>No measures at national level</i> <i>The proposed Vehicle Technology and Aviation Bill 2017 aims to promote automated driving by addressing insurance issues</i>
✓ National measures to support non-motorized transport	Local Sustainable Transport Fund provides funding to promote uptake of cycling and walking Cycling and Walking Investment Strategy
✓ Road charges	Toll charges on selected motorways, bridges and tunnels (traffic congestion charges in London and Durham peninsula)

Energy

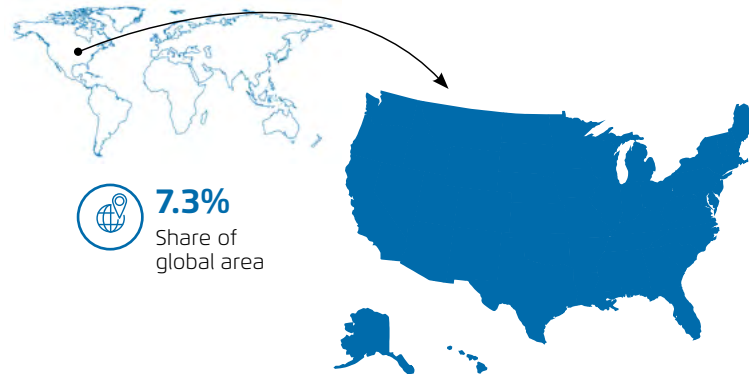
✓ Energy/carbon emission standards LDV	EU CO ₂ efficiency targets Passenger cars: 95 g/km (2021) Light commercial: 147 g/km (2020)
Energy/carbon emission standards HDV	<i>No standard</i>
✓ Pricing instruments	First-year special registration tax based on CO ₂ Circulation tax based on CO ₂
✓ Mandatory vehicle labelling	National implementation of the EU Car Labelling Directive 1999/94/EC
✓ Support mechanism for electric vehicles & charging infrastructure	CO ₂ /km-based and zero-emission range-based purchase subsidy scheme Fuel duty exemption, vehicle excise duty exemption for BEVs and discount for PHEVs Reduced taxation for company cars Planned government spending on ultra-low emission vehicle manufacturing and adoption
✓ Support for other low-carbon fuels and propulsion systems	Renewable energy targets 2020: 10% of transport fuels from renewable sources Fuel Quality Directive (2009/30/EC) requires member states to reduce the GHG intensity of fuel by 6% by 2020 Clean Vehicles Directive 2009/33/EC Green Bus Fund
✓ Mandatory biofuel targets	The EU has a mandatory requirement of 10% renewable energy in transport by 2020, with a cap of 7% for first generation biofuels. This also applies to the UK, which currently has a mandated share of 4.75%. This was scheduled to increase, but it is unclear how this will develop after Brexit.

Source: See national sources UK

UNITED STATES

The US features large urban clusters on its western and eastern seaboard, with large areas that are less densely populated inland. The large distances between cities make air travel an increasingly important mode of transport, accounting for more than 11% of passenger transport volumes. Automobiles and light trucks still dominate passenger transport, and the highway share of passenger miles traveled in 2013 was about 87%. Mass transit and rail travel play a minor role in passenger transport, but rail plays an important role in freight, accounting for one-third of freight volumes.

The US has not set specific targets for the transport sector. The NDC showcases one of the main instruments, the light-duty and heavy-duty fuel economy standards.



7.3%
Share of global area

9,831,510 km²
TOTAL AREA (2016)

35.14 People/km²
POPULATION DENSITY (2015)
WORLD AVERAGE: 57



0.92 HDI*
HUMAN DEVELOPMENT INDEX* IN 2015



WORLD AVERAGE: 0.72

Source: UNDP

* The human development index is a value from zero to 1, with 1 representing the highest possible development according to the covered indicators



52,704 constant 2011 international \$ (PPP)
GDP PER CAPITA (2015)

1,000 \$



G20 AVERAGE: 18,379



WORLD AVERAGE: 14,725



15.66%
SHARE IN GLOBAL GDP (2015)



Source: Climate Action Report 2014 USA; CIA World Factbook; ITF/OECD

Sources: World Development Indicators



POPULATION

321.4 mio people
POPULATION CURRENT IN 2015

4.4%
SHARE IN GLOBAL POPULATION IN 2015

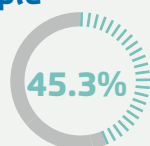


URBANISATION

81.6% of total
URBAN POPULATION IN 2015
74.86%
G20 AVERAGE¹
53.86%
WORLD AVERAGE



145,451,993 people
POPULATION IN URBAN AREAS OF > 1 MIO (2015)
45.3%
SHARE IN TOTAL POPULATION 2015



Source: World Development Indicators

Source: World Development Indicators



MOBILITY

862 road motor vehicles per 1,000 inhabitants

MOTORISATION RATE (2014)

100 Inhabitants
100 Motor Vehicles



5,189,743 mio passenger-km

PASSENGER TRANSPORT VOLUME* (2014)



7,769,876 mio tonne-km

FREIGHT TRANSPORT VOLUME** (2014)



* Includes road and rail transport, not non-motorised transport modes

** Includes road, rail and inland waterways, does not include pipelines or air transport

Sources: ITF/OECD, World Development Indicators

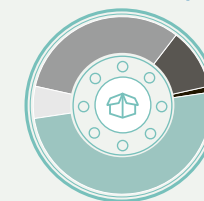
Passenger-km per mode



Road, Car: 89%
Road, Bus: 11%
Rail: 0%

Year: 2014

Tonne-km per mode



Road: 50%
Inland waterways: 6%
Rail: 32%
Pipeline: 11%
Domestic Air: 1%

Year: 2011

¹ G20 average includes the EU and excludes individual EU member states (France, Germany, Italy, UK) to avoid double counting

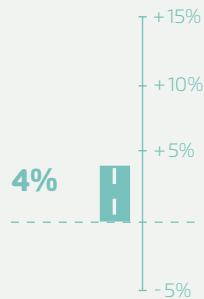


TOTAL EMISSIONS

Total CO₂ emissions from fuel combustion in the US have increased by 4% since 1990, with emissions from the transport sector increasing by 23% over the same period to one-third of total emissions. Per capita emissions are the second highest in the G20, only surpassed by Saudi Arabia. Per capita transport emissions are the highest in the G20. Aviation plays an important role in domestic transport, representing 9% of sector emissions, the second highest share after Australia.

4,997.5 Mt CO₂

TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION (2015)



TOTAL CO₂ EMISSIONS FROM FUEL COMBUSTION PER CAPITA (2015)



t CO₂ per capita



SHARE IN GLOBAL EMISSIONS (2015)

15.43%



Sources: IEA, UNDESA, IEA CO₂ emissions from fuel combustion

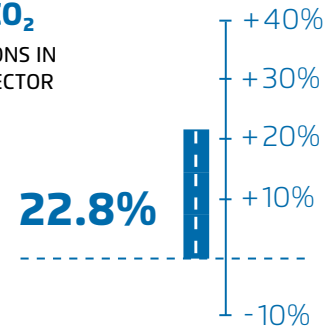


TRANSPORT SECTOR EMISSIONS

1,751.97 Mt CO₂

TOTAL GHG EMISSIONS IN THE TRANSPORT SECTOR (2015)

CHANGE IN TRANSPORT SECTOR EMISSIONS (1990-2015)



SHARE OF TRANSPORT EMISSIONS IN TOTAL CO₂ EMISSIONS (2015)



World Average: 23%
G20 Average¹: 20%

TOTAL CO₂ EMISSIONS PER CAPITA IN TRANSPORT SECTOR (2015/2030)



2015



G20 Average¹: 1.11

2030

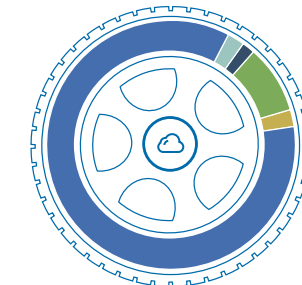


G20 Average¹: 2.33

t CO₂ per capita

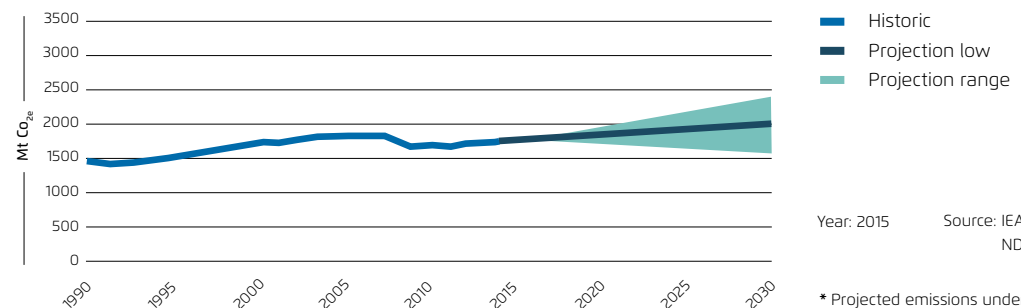
Sources: IEA, UNDESA, SloCaT

Transport emissions by subsector



Year: 2015 Source: IEA

Historic and projected* emissions in the transport sector





ENERGY

US Cents/Litre GASOLINE PRICE (2016)

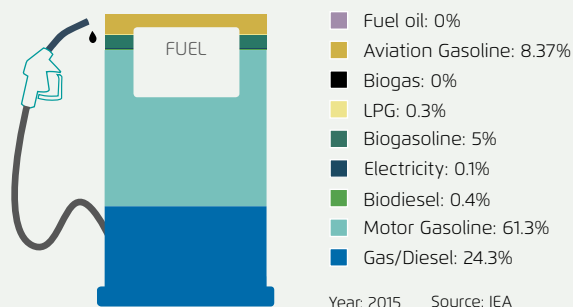


US Cents/Litre DIESEL PRICE (2016)



Source: GIZ SUTP

Energy use in transport by fuel



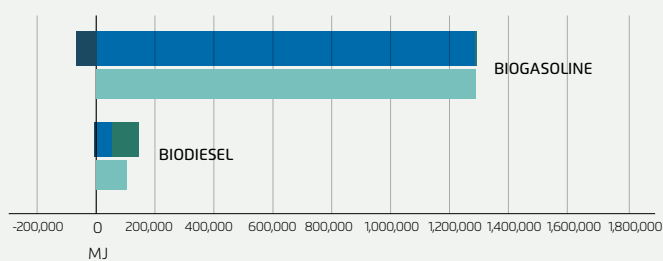
Year: 2015 Source: IEA

SHARE OF BIOFUELS IMPORTED (2015)



Biofuel supply and use*

■ Production ■ Exports ■ Imports ■ Use in Transport



* Excluding biogas, as this is mostly used in other sectors

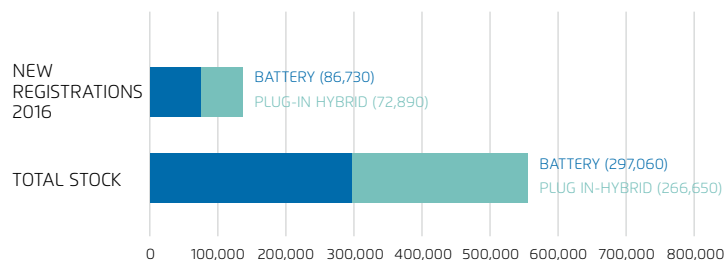
Year: 2015 Source: IEA



ELECTRIC VEHICLES

TOTAL STOCK OF ELECTRIC CARS (2016)

NEW REGISTRATIONS OF ELECTRIC CARS (2016)



Year: 2016

MARKET SHARE OF ELECTRIC CARS IN THE NATIONAL MARKET (2016)

0.91%

SHARE OF NEW REGISTRATIONS IN TOTAL EV STOCK (2016)

28.3%

PUBLICLY ACCESSIBLE CHARGE INFRASTRUCTURE (2016)

■ 35,089 *
SLOW CHARGE

■ 5,384 *
FAST CHARGE

-- 13,969 *
SLOW CHARGE
G20 AVERAGE¹

-- 13,295 *
FAST CHARGE
G20 AVERAGE¹

* number of units

NO DATA (SHARE OF
ELECTRIC CARS IN
TOTAL PASSENGER
CAR STOCK)

%

Source: IEA EV Outlook 2017

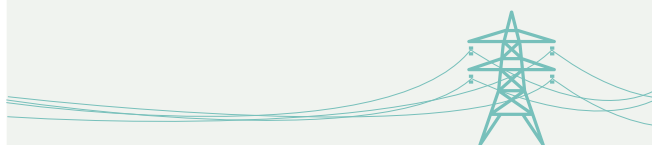


LINKAGES TO THE ENERGY SECTOR

In the US, coal and natural gas are the primary fuels for power generation, followed by nuclear with a 19% share. One of the main policies for supporting renewables is the Renewable Electricity Production Tax Credit (PTC). Originally enacted in 1992, the PTC provides a per-kilowatt-hour tax credit for a ten-year period beginning on the placed-in-service date for electricity generated by qualified energy resources. From 2017 onward only wind is eligible for the PTC. A second policy for supporting renewables is the Business Energy Investment Tax Credit (ITC), which, depending on the technology, applies corporate tax credits at varying rates.

Existing targets for renewable electricity generation

No national target, state-level targets in 29 states



455.6 gCO₂/kWh

GRID EMISSION FACTOR (2015)

% of total
electricity output

SHARE OF RENEWABLES IN
ELECTRICITY PRODUCTION* (2014)

8,872 GWh

ELECTRICITY USE IN TRANSPORT
(2015)

SHARE IN TOTAL ELECTRICITY USE

* Including hydropower

Sources: IEA, World Development Indicators, reegle;
U.S. Dept of Energy



AMBITION

NDC target

Committed to a 26-28% reduction in GHG emissions in 2025 compared to 2005

Transport related target

No mention

Transport related measures

Introduce fuel economy standards for light-duty vehicles for model years 2012–2025 and for heavy-duty vehicles for model years 2014–2018

Targets at national level

The US does not have specific national targets for the transport sector.

Source: NDC, US Mid-Century Strategy for Deep Carbonization 2016



TRADE-OFF'S

Sustainability of biofuels

To meet environmental objectives, new biofuel production from 2016 onward is to be derived from cellulosic or other advanced biofuels that reduce lifecycle greenhouse gas emissions by at least 50%.

Source: reeple

Subsidies

1 Billion USD

LEVEL OF FOSSIL FUEL SUBSIDIES IN THE TRANSPORT SECTOR (2014)

Federal tax breaks are available for various types of offshore oil and gas production. The Strategic Petroleum Reserve (SPR) is also a source of support to the oil industry, as its costs are covered entirely by the federal government.

Source: OECD



IMPLEMENTATION

Mobility

✓ National programmes to support shift to public transport	New Starts and Small Starts Programmes (transit rail and busway investments) Pilot Program for Transit-Oriented Development Planning
✓ Measures to support low-carbon freight logistics	SmartWay Initiative (in coordination with Canada)
✓ National-level measures to support new mobility services	Mobility on Demand Sandbox Program Federal Automated Vehicles Policy
✓ National measures to support non-motorized transport	Bicycle and Pedestrian Program Strategic Agenda for Pedestrian and Bicycle Transportation
Road charges	<i>No toll system at federal level</i> <i>The Federal-aid Highway Program enables states and public entities to implement toll systems</i>

Energy

✓ Energy/carbon emission standards LDV	Target 2025: 56.2 mpg or 143 gCO ₂ /mi for passenger vehicles
✓ Energy/carbon emission standards HDV	Phase 1 (2014-18): 5–9% fuel saving compared to 2010 baseline Phase 2 (2018-27): 9–12% fuel saving compared to 2010 baseline
✓ Pricing instruments	Gas-guzzler tax on high-CO ₂ vehicles
✓ Mandatory vehicle labelling	EPA Motor Vehicle Fuel Economy Label
✓ Support mechanism for electric vehicles & charging infrastructure	Tax credit of USD 2,500 to USD 7,500 to be phased out after 200,000 units per manufacturer are sold for use within the country
✓ Support for other low-carbon fuels and propulsion systems	Clean vehicle rebate Project: rebates for zero emission vehicles Energy Policy Act: pilot projects for advanced vehicles Low or No Emission Vehicle Program Tax credits for ethanol
✓ Mandatory biofuel targets	The Renewable Fuel Standard sets absolute targets at 73 billion litres of renewable fuels, including 1.2 billion litres of cellulosic biofuel, 7.8 billion litres of biomass-based diesel, 16.2 billion litres of advanced biofuel, and 7.9 billion litres of biomass-based diesel fuel in 2018. This is scheduled to increase to 136 billion litres of renewable fuels by 2022.

Source: See national sources U.S.



09

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10

**ANNEX: DATA SOURCES
FOR FACTSHEETS**

10 | Annex: Data sources for factsheets

Cross-cutting

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In partnership with key players in the field of politics, economics, science and civil society, Agora Verkehrswende aims to lay the necessary foundations for a comprehensive climate protection strategy for the German transport sector, with the ultimate goal of complete decarbonisation by 2050. For this purpose we elaborate the knowledge base of climate protection strategies and support their implementation.

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