



# Decarbonising Argentina's Transport System

Charting the Way Forward



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## Foreword

DTEE is a joint effort between the International Transport Forum (ITF) and the Wuppertal Institute (WI). It aims at supporting authorities from Argentina, Azerbaijan, India and Morocco in assessing their policies for meeting their transport decarbonisation objectives. For this, the project develops a common modelling assessment framework for measuring impacts of various transport decarbonisation measures. The common framework is adapted to country-specific priorities and characteristics, in dialogue with national authorities. DTEE is part of the ITF's Decarbonising Transport initiative (DTi). It is funded by the International Climate Initiative (IKI) of the German Federal Ministry for Environment, Nature Conservation and Nuclear Safety (BMU). The project spans from 2019 to 2022.

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## Decarbonising Transport in Emerging Economies: The case of Argentina

Freight transport activities are essential in Argentina. Bulk commodities' import and export are at the heart of the country's economy. These flows take place over very long distances and harsh terrain. Road transport is responsible for most freight transport in the country, and trucks, which have a particularly high carbon intensity, also have the highest share of emissions of the transport sector. Yet, other alternatives exist, for instance, for less carbon-intensive modes (e.g. railways and inland waterways) and more efficient road transport (e.g. scalable trucks, telemetrics or best practices promoted by voluntary programmes).

This paper highlights important findings from kick-off meetings for the Decarbonising Transport in Emerging Economies project (DTEE) in Argentina. It gives a brief overview of freight transport activity in the country, covering the road, railways, ports and inland waterways, and urban logistics sectors. It also highlights some of the main challenges and opportunities for decarbonising freight transport. Freight transport decarbonisation measures need to be aligned with sustainable development goals, regional cohesion and increased efficiency of the transport system, while adhering to high budgetary constraints.

Solutions that address these various requirements are possible, and will become increasingly important given the sanitary and economic crisis due to the spread of Covid-19. Multi-modality, particularly between railways and ports around the country, is one potential way forward, as well as increased efficiency in road transport or an increased use of inland waterways. A review of the current tools used by the federal government for transport modelling and of data availability for different modes in the country is presented, as is exploring new avenues for modelling. The paper concludes by showing the proposed next steps for the DTEE project in Argentina.

This paper is a summary of a longer report, shared with Argentinian authorities and other stakeholders. The longer version can be obtained upon request to the ITF (<https://www.itf-oecd.org/dtee-argentina>).

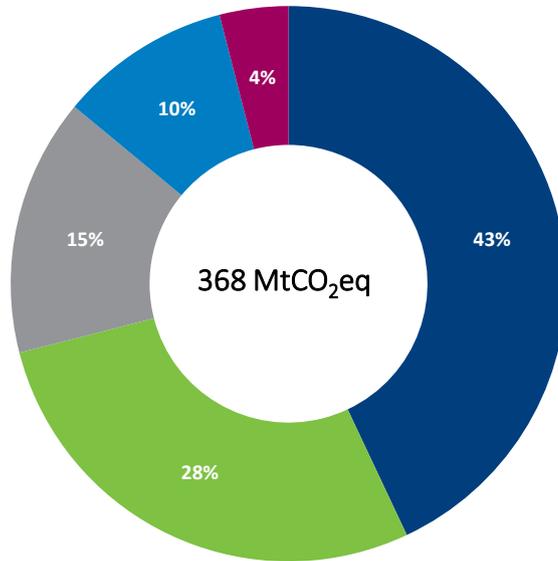
### Challenges of transport decarbonisation in Argentina

Passenger and freight-transport activities in Argentina are responsible for 15% of the country's CO<sub>2</sub> emissions (Figure 1). More than 90% of these emissions stem from road transport activities. Half of all road transport emissions are produced by freight trucks. Private cars come at a close second, at around 42% of road transport emissions. High freight emissions are linked to movements of bulk commodities in the country, mainly by road transport (Ministry of Transport, 2017).

Transport decarbonisation is one of the main sectorial objectives for meeting Argentina's Nationally Determined Contributions (NDCs). The country's transport decarbonisation strategies are set in the National Plan for Transport and Climate Change (PNAyCC for its Spanish initials). More than 60% of transport emission savings are planned to stem from mitigating emissions caused by freight transport (Ministry of Environment and Sustainable Development, 2017).

Figure 1. Argentina's total GHG emissions in 2014 by sector share (in %)

■ Agriculture, livestock and deforestation ■ Energy Production ■ Transport ■ Industry ■ Waste



Source: based on Ministry of Environment and Sustainable Development (2017).

The Covid-19 global crisis will create new challenges that need to be considered in decarbonising transport initiatives in Argentina. The economic crisis and budget constraints, already severe before the pandemic, will be increasingly challenging. In this context, transport decarbonisation policies will need to allow for maintaining the competitiveness of Argentinian production and exports, in a context of high uncertainty.

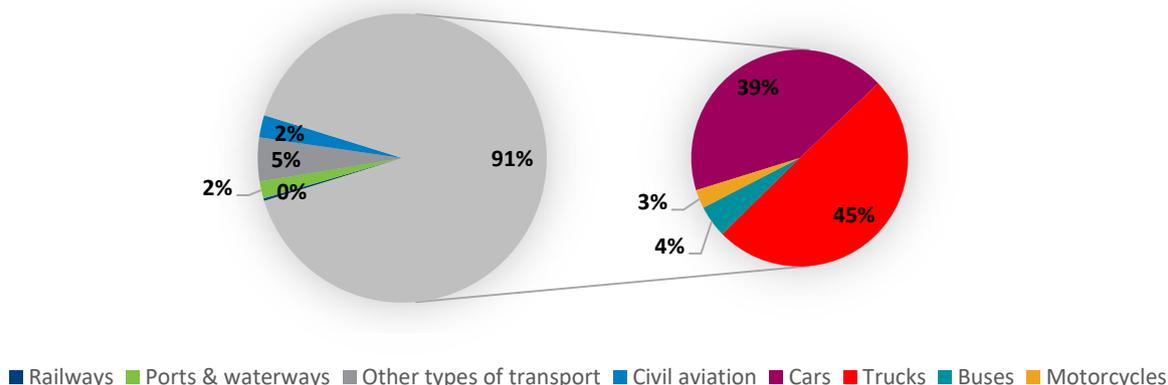
The sheer size and geography of Argentina is a further challenge. Lack of institutional coordination for freight transport policies between the federal and provincial governments can also be an obstacle for effective decarbonisation plans.

Finally, increased coordination between relevant sectors is needed to take into account the whole GHG emissions' production chain to achieve successful and effective decarbonisation actions. Attention should be given to emissions linked to the production of alternative fuels in the country, as an example.

## Transport decarbonisation in Argentina: Why focus on freight?

Freight is responsible for more than half of transport GHG emissions in Argentina (Figure 2). It is also essential for the long-term economic performance of the country, in particular its exports which need to be moved from the Argentinian hinterland to the world market crossing vast distances.

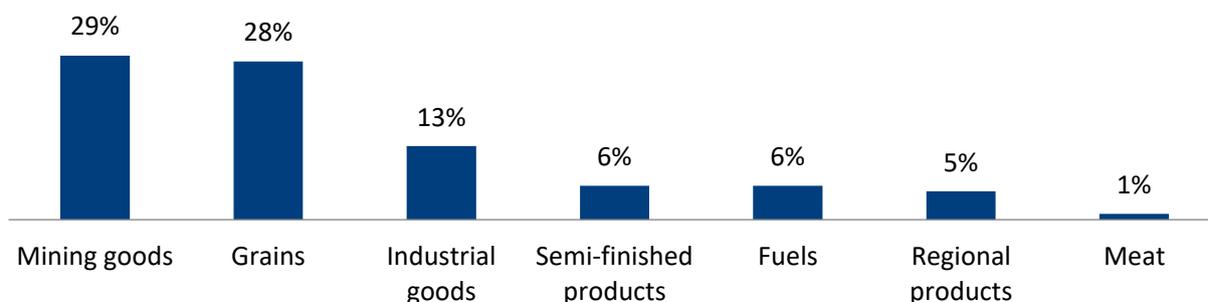
Figure 2. Argentina's transport-based CO<sub>2</sub> emissions in 2014 by mode (in %)



Source: based on Ministry of Environment and Sustainable Development (2017).

In 2018, 536 million tonnes of freight were transported within Argentina, and another 141 million tonnes were traded with other countries. The type of products transported varies with its origin and final destination. Around 70% of exported products were either cereals or feedstock. More than half of total imports are fuels and sub-products (Ministry of Transport, 2019a). Inside Argentina, around 60% of goods circulated with freight transport stemmed from either mining or grains (Figure 3).

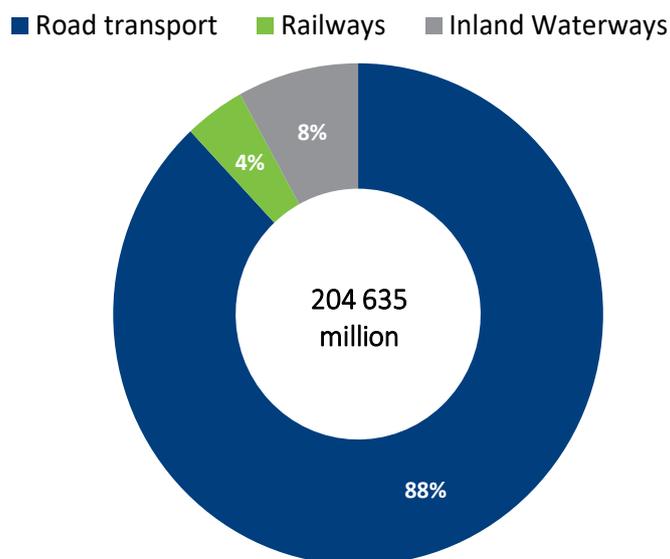
Figure 3. Goods circulated by internal freight transport in Argentina in 2018 by category (in %)



Source: based on Ministry of Transport (2019a).

Also in 2018, Figure 4 shows that most internal freight transport of goods was done by road (i.e. almost 90% of total tonnes-km). Rail and water transport only amounted to 4% and 8% respectively (Ministry of Transport, 2019b).

Figure 4. Modal repartition of internal freight movements in Argentina in 2018 (in % of total tonnes-km)



Source: based on Ministry of Transport (2019b).

Maritime transport is the most important mode for international trade (imports and exports). In 2018, more than 90% of imports and two-thirds of exports were transported to and from Argentina by this mode. The rest of freight was transported by road and, in the case of energy-related imports, by pipeline (Ministry of Transport, 2019b).

## Reducing emissions of road freight transport in Argentina

Road freight transport activities are responsible for more than 45% of all transport CO<sub>2</sub> emissions in Argentina. Most freight volumes are transported on the Buenos Aires-Rosario axis. Bulk products, such as those stemming from mining activities, grains and fruits, represent most of the transported volumes in the country. The goods transport market is dominated by small enterprises holding fewer than five vehicles. Such an atomised market carries various challenges for decarbonisation. Some of these include increased difficulty for implementing regulations, as well as promoting vehicle technology improvements, across the supply chain. More than 80% of vehicles used are medium to heavy vehicles, with a capacity to carry above four tonnes (Figure 5). Low-vehicle loads are common, as a sign of inefficient transport activities (Fiadone, Filadoro and Sánchez, 2018). Low loads can entail higher logistic costs for operators, as well as increased number of trips which could have been avoided with heightened logistic efficiencies.

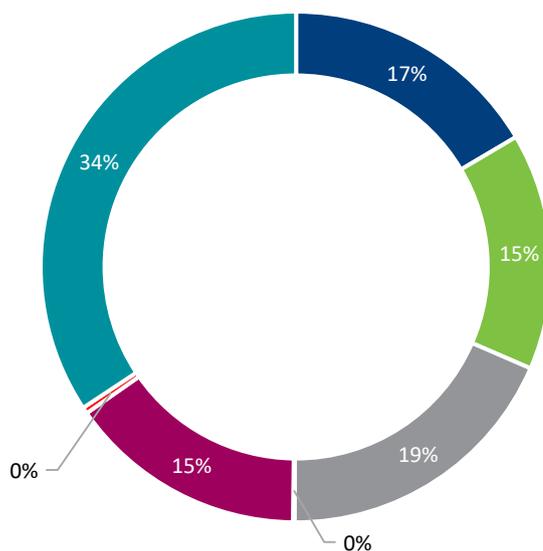
The average age of vehicles in the fleet is 14 years. Coupled, lorry-type vehicles are the oldest type of vehicle on average of the fleet, around 19 years of age on average. In comparison, the average age of heavy duty vehicles in Europe is 8.1 years (EEA, 2014). In certain activities, such as transporting soybean and grains during harvest season, it is not uncommon to have vehicles over 40 years of age partly due to a lack of effective controls.

Almost 90% of all internal freight transport in Argentina is still expected to be done by road transport in 2030 (Ministry of Transport, 2018). A step toward reducing the emissions from such road transport activities could stem from promoting multi-modality; increasing vehicle and operational efficiencies; and looking at alternative vehicle technologies. Infrastructure investments might be needed for paving roads and other infrastructural improvements.

National authorities have put policies in place to increase vehicle efficiencies, namely through a voluntary smart-transport pilot programme (Fiadone, Filadoro and Sanchez, 2018). Authorities have also promoted regulatory measures that allow for the use of high capacity vehicles (HCVs): the scalable vehicles (escalables) up to 55.5 tonnes and the even heavier bitrenes (up to 75 tonnes). The scalable vehicles have been much more widely adopted since they have a lower cost and are more flexible, with less restrictions to use across the country's road network (Ministry of Transport, 2018). Estimated benefits of escalables include reducing costs by up to USD 1.7 billion between 2019 and 2030; as well as by decreasing up to 14% of total fuel use in the same period (Ministry of Transport, 2018).

**Figure 5. Share of road freight vehicles per vehicle type in Argentina (2017 values)**

■ Coupled lorry ■ Light vehicles ■ Semi-trailer ■ Special motorised vehicle ■ Tractor ■ Trailer ■ Trucks



Source: based on Fiadone, Filadoro and Sanchez (2018).

Authorities are aiming to increase the use of biofuels in the country. Decree 543/2016 is one example and requires all diesel and petrol in the country to be blended with at least 10% and 12% of biodiesel and bioethanol respectively (Ministry of Justice and Human Rights, 2016).

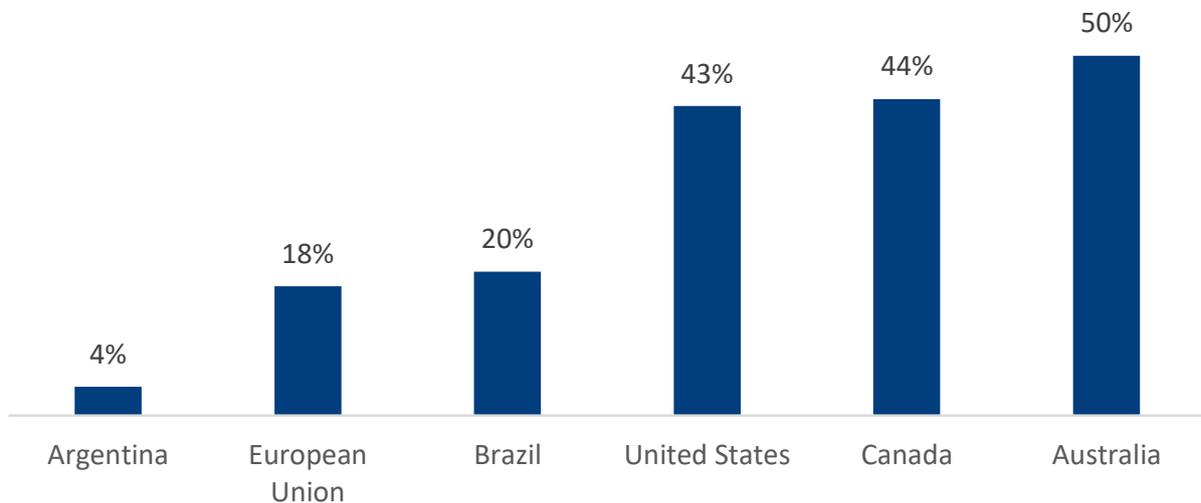
## Increasing rail freight activity for decarbonising Argentina's transport

Railway freight activity in Argentina only emits around 0.3% of all transport emissions in the country (Ministry of Environment and Sustainable Development, 2017). At the same time, only 4% of internal freight volumes are transported by railways. A rate that is considerably lower than the railways share found

in other countries of similar geographical size (Figure 6). Argentina has one of Latin America's longest railway networks, yet, only about 60% of the concessioned network is in operation (CNRT, 2018). Operations are carried out by three private and one public operator. Private operators transport the highest share of volumes in the country. Most transported volumes are agricultural-based products, as well as others stemming from mining operations (CNRT, 2018).

Argentinian authorities have been increasing railway investments so as to promote rail freight activity in recent years. In 2015, a law was adopted making railway investments a national priority (Ministry of Justice and Human Rights, 2015). Between 2015 and 2019, public works for more than USD 8.8 billion were assigned to improve and increase the railway networks in Argentina (Trenes Argentinos Infraestructura, 2019). Infrastructure and fleet investments from the three private operators have generally been below contractual agreement levels (CNRT, 2018). Ongoing public sector-led infrastructure projects, aimed at increasing service levels, have leveraged on private investments. This has been the case, for instance, with investments on local sidings and branches to increase the use of rail, mainly for grain transport. These projects have particularly been serviced by the public rail operator.

**Figure 6. Share of total rail freight movements in Argentina and other countries or regions of similar size (% of total tonnes-km in 2014)**



Sources: based on Barbero (2017); NTC Australia (2016); Serrano Colavite and Konishi (2015).

The share of total transported freight volumes held by rail is expected to triple by 2030, thanks to projected public infrastructure investments in the country (Ministry of Transport, 2018). Increasing railways' transport share could be one of the effective ways of decarbonising freight transport in Argentina. Public and private investments in the recent years have aimed at facilitating multi-modality between railways and inland waterways in the country. Dry ports across Argentina and new rail terminals for grain transport offer such examples.

## **Increasing the resilience of inland waterways and their integration with other modes could further decarbonise freight transport**

Argentina has an immense waterway network that stretches 4 600 km and holds 102 public and private ports (García, 2019). More than 90% of Argentinian exports, and 75% of imports, are done by water-borne transport. Yet, only 8% of internal freight activities are done by this mode (Ministry of Transport, 2019b). The main port in the country is the port of Buenos Aires, the country's main gateway for containers and other commodities into the hinterland. Rosario is the main centre for grain exports. Around 60% of the inland waterways' flows are within the Trunk Waterway/Hidrovia Paraguay-Paraná (VNT) (Figure 7). Most external flows are linked to agricultural products, while internal freight is mostly linked to transport of mining and oil-related products.

Water-borne activities are challenged by the limitations of waterway infrastructure in Argentina, as well as by its constant maintenance costs. Dredging efforts are essential for deepening the low-draft levels along the waterways (Merk, 2018). Authorities will need to renew the dredging concession for the trunk waterway network in the country in 2021. Maintaining and increasing dredging efforts might be required to better use ship capacity and address high delays in circulation. The need for resilience is particularly relevant in the context of the eventual impacts of climate change and large scale deforestation. Projected dredging efforts, as well as other infrastructure investments, should take potential impacts into account such as decrease in waterway depth, increased flow of sediments and extreme weather events.

Increasing the share of inland waterways transport for internal freight could be a tool for decarbonising freight transport in Argentina. Fostering multi-modality with railways and road transport could potentially increase the attractiveness of this mode for internal freight movements. Improved co-ordination between national, provincial and private actors could facilitate the allocation of investments to this end.

Figure 7 shows the Argentinian segment of the Paraguay-Paraná Hidrovia (waterway), as part of the wider inland waterways network running through Argentina, Brazil, Paraguay and Uruguay. The Argentinian segment of the Paraguay-Paraná Hidrovia is the main inland waterways transport axis in the country.

Figure 7. Main waterways in Argentina and neighbouring countries



Source: Ministry of Transport (2019c).

## Brief insights on urban logistics for the Buenos Aires area

The decarbonisation of urban logistics will be one priority area of the DTEE project. For the time being, the only available data in terms of urban logistics' CO<sub>2</sub> emissions and decarbonisation policies concern the Buenos Aires metropolitan area. Future steps at a later stage of the project will address this data gap so as to better analyse logistics emissions and actions in other urban areas of Argentina, such as Rosario.

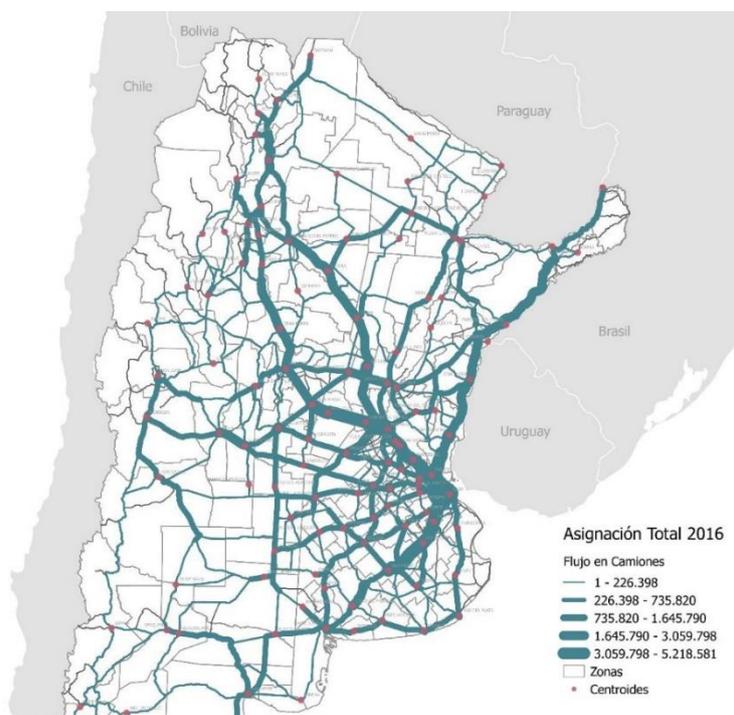
Urban logistics is responsible for around 25% of transport-related CO<sub>2</sub> emissions in the Autonomous City of Buenos Aires (Autonomous City of Buenos Aires, 2019). City authorities are implementing pilots with logistics service operators so as to better understand their practices. Pilot programmes aim to acquire knowledge on an area that has until recently been unexplored by public authorities.

## Modelling and data availability for national freight transport in Argentina

Transport policy in Argentina has been supported by a suite of models developed in recent years (from 2012 to 2019) in the country's Ministry of Transport. Models are focused on national freight transport, which has a strategic importance for the country. They allow evaluating different alternative investments, as well as policy questions. Among others, they have helped assess the impacts of several measures contained in the National Transport and Climate Change Action Plan (PANTyCC in its Spanish initials).

In addition, the models mitigate existing gaps on data collection to some extent, e.g. for road freight movements (Figure 8). The tools developed are quite detailed and sophisticated, reflecting the level of skills and know-how that exists in Argentina.

**Figure 8. Road freight flows (in number of trucks) assigned to the network in 2016**



Source: Adapted from National Direction of Freight Transport and Logistics Planning (2019).

Note: English translation of legend; Asignación Total 2016 = Total assignment 2016, Flujo en Camiones = Flow of trucks.

There are also several areas where the ITF, in the framework of the DTEE project, can assist with further developments. Complementarities that exist between the work already developed in Argentina and ITF’s suites of models, means the directions for which ITF support may be most useful concerning the quantitative work and project scope are to:

- assess impacts on the Argentinian transport decarbonisation pathways brought about by international changes to transport networks and policies
- assess the impacts of exogenous factors on transportation (e.g. teleworking, 3D printing, trade regionalisation, etc.)
- adapt ITF’s Urban Logistics model to various Argentinian metropolitan areas.

In addition, the project can directly support local expertise in the pursuit of the above-mentioned objectives. For instance, modelling efforts in the project can contribute to introducing useful specific parameters and functionalities into existing Argentinian models. The project can also be a platform for promoting dialogue between different parts of the federal government, local levels of governance and other actors. This can be a way for fostering synergies and disseminating know-how. Some gaps in data collection might be an aspect to address as well, e.g. concerning road freight movements.

## Charting the way forward: Supporting policy exchange and further modelling developments

The Decarbonising Transport in Emerging Economies project (DTEE) will keep on supporting authorities' efforts to decarbonise transport in Argentina. Activities by the ITF and the Wuppertal Institute will be carried out while also putting other policy priorities at the forefront of the agenda. Particular attention will be given to sustainable development, increased access to opportunities and markets, as well as to enhancing the competitiveness of Argentinian products and industry. The need to jointly tackle all of these objectives gains added prominence due to the economic and social challenges brought about by the Covid-19 global crisis.

Policy actions for decarbonising Argentina's transport system will go hand in hand with a strategy of increasing multimodality in Argentina's internal freight activities. Increasing the role of inland waterways transport, as well as of railways, will also be essential for reducing internal freight transport greenhouse gas emissions (GHG). Combining the flexibility of road transport with the high capacity and efficiency of other modes will be essential for increasing the overall competitiveness of the system. Road transport will continue having an essential role in the decarbonisation of freight transport in Argentina. Even with modal-shift policies, it is estimated to remain the dominant mode. Hence, policies directed at increasing the efficiency of, and decreasing emissions from, road freight will also be relevant.

Various challenges exist for promoting freight transport activities that emit lower GHG emissions, while also addressing the access and competitiveness needs in Argentina:

- Obtaining the funding and developing the financing schemes required for the infrastructure and fleet improvement investments in the country, in a context of budget constraints and economic uncertainty.
- Developing the institutional frameworks that allow coordinating efforts between various actors across different sectors and institutional levels. This applies, for instance, to coordination between public authorities and small-sized truck companies with the objective to include them in the smart transport programme.
- Argentina's large size is a main challenge for transport activity in the country. Argentina's 2 780 400 sqkm make it the world's eighth-largest country. Transporting freight over long distances in a sustainable manner is of particular concern for Argentinian agricultural exports. The long distances between Argentina and its core export countries mean that if Argentinian exports are to remain competitive, freight transport needs to be as low-cost and efficient as possible.

Beyond challenges, key strengths and opportunities are worth mentioning. A clear strength is the available tools and know-how of the federal government. The country's administration has managed to develop sophisticated transport models to assess the development of transport operations in the country, as well as some of their economic and environmental impacts. High human capital goes hand in hand with sophisticated data collection and reporting efforts developed under the two previous administrations, which allows exploring longer-term trends and monitoring new ones.

The DTEE project will continue with short and medium term actions in Argentina between 2020 and 2022. Actions will aim at supporting policy exchange and technical work by Argentinian authorities at the national, provincial and local levels.

The following provides a rough timeline of the further actions of the DTEE project in Argentina:

**July 2020: Series of webinars on transport decarbonisation in times of unprecedented global crisis.** The webinar series will aim at presenting and discussing present and potential decarbonisation actions and measures. This takes place against the backdrop of the combined health and economic crisis caused by the spread of Covid-19. Thus, ensuring health requirements, re-starting the economy and doing this while decarbonising the transport system will be the main theme for these seminars. They will also seek to facilitate exchanges between different stakeholders, as well as to promote institutional alignment for the implementation of decarbonising measures, increase regional-level dialogue and contact between the private and public sectors. A policy brief highlighting the main guidelines resulting from discussions will be issued. Beyond policy discussions, a session during the seminars will formulate specifications for the country-tailored modelling assessment framework.

**By June 2021: Assessment framework and modelling development in Argentina.** Quantitative analysis is under development to test the impact of decarbonisation measures and scenarios in Argentina. Modelling activities will include supporting the improvement of existing tools developed by public authorities in Argentina, as well as adapting relevant and existing ITF models to Argentina.

**By December 2021: Supporting wider policy exchange between selected emerging economies.** Another key event in the project will be the organisation of a session in the ITF's annual summit. There, representatives of all the project focus countries (Argentina, but also Azerbaijan, India and Morocco) will have the opportunity to present their challenges and opportunities regarding transport decarbonisation, as well as to exchange experiences. Representatives from development banks will provide an overview of their support for transport GHG reduction measures in emerging economies. Dates for this special session will be pending developments on the next ITF Summit. The 2020 Summit has been postponed due to the Covid-19 outbreak.

**By December 2022: Fostering policy exchange between Argentina and its Latin American peers.** Additional policy workshops will be developed with other Latin American countries to foster policy exchange across the region and support the creation of transport decarbonisation pathways for more countries in the region. These events will take place until the end of the project, and will potentially be held in wider forums (e.g. UNFCCC meetings).

**By December 2022: Training workshops for local authorities.** The workshops, both online and in-person, will aim at building capacity of Argentinian authorities to use the quantitative tools developed during the project. Workshops will also include matters such as how authorities could adapt the tools to their specific contexts, for instance at a city or regional level.

For more information on future activities on DTEE – Argentina: <https://www.itf-oecd.org/dtee-argentina>.

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## Decarbonising Argentina's Transport System

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This paper reviews opportunities for mitigating greenhouse gas emissions from Argentina's transport sector. It also identifies the main challenges for that objective, specifically in freight transport. Actions taken at different levels of government are assessed and the impact of policies focused on other priorities - such as lowering logistic costs - is discussed. The paper also highlights what data on transport emissions are available for Argentina and which tools government agencies use for examining them.

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