

**Transport CO<sub>2</sub> and the  
Paris Climate Agreement:  
Where Are We Six Years Later?**

## About the International Transport Forum

The International Transport Forum at the OECD is an intergovernmental organisation with 63 member countries. It acts as a think tank for transport policy and organises the Annual Summit of transport ministers. The ITF is the only global body that covers all transport modes. The ITF is administratively integrated with the OECD, yet politically autonomous.

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Climate change will not be stopped without decarbonising the movement of people and goods. But how is transport reflected in national decarbonisation plans? This paper reviews the role of transport in the Nationally Determined Contributions under the Paris Agreement, which outline the climate actions of 194 countries.

## Are the updated NDCs showing more ambition to cut transport CO<sub>2</sub>?

More than 190 nations committed to reducing greenhouse gas emissions sufficiently to limit global warming to 1.5°C when they signed the Paris Agreement in December 2015.<sup>1</sup> To achieve this goal, they also agreed to draw up national decarbonisation strategies, widely known as Nationally Determined Contributions (NDCs). Significantly, these NDCs are revised and tightened every five years.

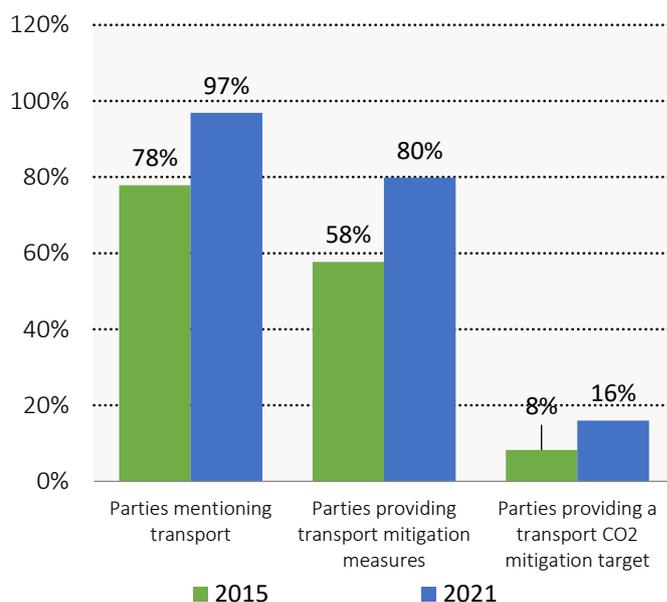
The transport-related commitments made in the first-round NDCs were insufficient. A review of the 2015 NDCs by the International Transport Forum missed "clear pathways and measures". It concluded that the "Paris climate agreement must still be translated into concrete actions for the transport sector".<sup>2</sup> Second-round NDCs were due for the 26<sup>th</sup> Conference of the Parties (COP26) in Glasgow in November 2021, offering an opportunity to take stock of progress in transport decarbonisation commitments since Paris.

Three high-level indicators help to capture progress made since 2015. Firstly, do NDCs mention transport? Secondly, do they list concrete transport decarbonisation measures? Thirdly, do they include a CO<sub>2</sub> reduction target for the country's transport sector? Use of the term "transport" in an NDC is counted as a mention. A measure is an announced intervention to reduce transport emissions, such as increasing the availability of charging infrastructure or investing in public transport. Also counted are mitigation objectives for transport sub-sectors, for instance "reducing CO<sub>2</sub> emissions of new

vehicles by X per cent". A target is a quantified reduction objective for overall national transport CO<sub>2</sub> emissions.

All three indicators point towards an increased commitment to transport decarbonisation. Since COP21, the number of countries mentioning transport has risen by 19 percentage points, those who list measures by 22 percentage points and those setting targets by eight percentage points. Figure 1 shows the evolution of the three indicators between the first and second rounds of NDCs submitted to the UNFCCC.

Figure 1. Share of NDCs with transport mentions, measures and targets, 2015 and 2021 (100%=194)



Almost all Parties now acknowledge the importance of transport for limiting climate change. In 2015, slightly above three quarters (78%) of countries having submitted their first NDCs evoked transport in them. This share has now risen to 97%. Only six countries do not mention transport at least once

<sup>1</sup> There are 192 Parties to the Paris Agreement. Eritrea and Iraq submitted NDCs despite not being signatories. Calculations are based on the 194 NDCs submitted. For simplicity, "countries" is used synonymously for "Parties", which also include non-state entities, e.g. the European Union.

<sup>2</sup> Transport CO<sub>2</sub> and the Paris Climate Agreement: Reviewing the impact of Nationally Determined Contributions (ITF, 2018)

in their NDC. This increase underlines the almost universal recognition of transport as a critical sector in achieving the goals of the Paris Agreement. On average, countries that mention transport refer to it 15 times in their NDCs. However, the average is misleading. While 14 countries mention transport only once, others do so extensively: Colombia's updated NDC includes 112 references to transport, and South Sudan's 117.

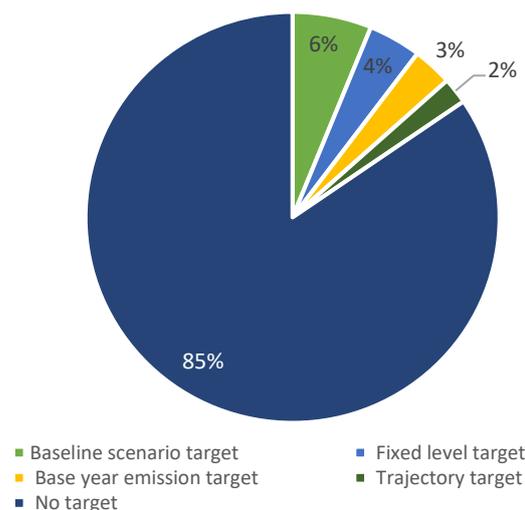
**The number of countries that propose concrete measures to reduce their transport-sector CO<sub>2</sub> emissions has risen significantly.** In 2015, only little more than half (57%) of countries proposed transport decarbonisation measures in their first NDC. With the second round of NDCs for COP26, this share has risen by half to 80% of all NDCs. The actions evoked range from increasing the share of alternative fuels in road transport to scaling up public transport. Some countries propose specific CO<sub>2</sub>-reduction targets for sub-sectors of transport, such as phasing out cars with combustion engines or reaching a certain share of electric vehicles by a specific date.

**The quality of measures in second-round NDCs appears to have improved with regard to their mitigation potential.** The ITF's analysis of the first-round NDCs found that the term "measures" often referred to desired outcomes rather than to actions to reach them or were vague and high-level only. An initial review of selected second-round measures reveals that for some countries at least, measures have become more concrete and likely to be effective. One NDC, for instance, only referred to "fuel efficiency measures" in 2016, while the 2021 NDC includes a variety of proposals, such as changing fiscal policies on fossil fuel by 2025 and establishing efficiency standards for the import of all vehicles. A more detailed analysis is needed to ascertain this first impression, however.

**The share of countries with a transport-wide CO<sub>2</sub> reduction target is still very low.** A disappointing 8% of the NDCs submitted in 2015 contained a concrete target for reducing the transport sector's carbon emissions. This share has now doubled to 16%. While this increase is significant, only one in six countries sets itself a concrete, measurable, time-bound objective for transport decarbonisation. This contrasts unfavourably with the fact that 92% of NDCs give an economy-wide mitigation target. While providing an overall target may be more or less self-evident, sector-specific targets make a global objective operational by driving effective action in clearly defined policy areas. The gap between a global decarbonisation objective and a list of policy measures to decarbonise transport highlights that most countries need to focus on quantifying the climate impacts of their transport sector and of the steps to reduce transport emissions.

**Only two of 194 countries have set net-zero transport emissions by 2050 as their decarbonisation target.** This compares with 33 Parties (17%) committed to making their whole economy carbon-neutral by 2050. Figure 2 shows the four types of transport mitigation targets and their shares defined by Parties in their NDCs.

Figure 2. **Types of transport mitigation targets defined by Parties in their NDCs (100% = 194 Parties)**

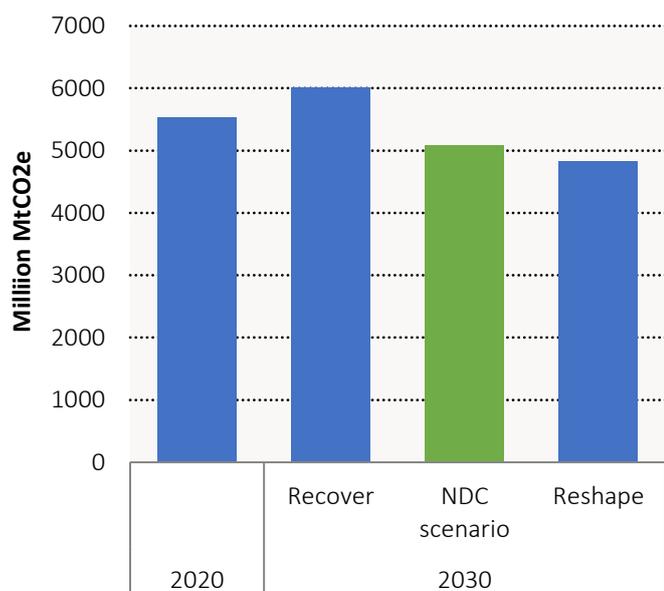


## How much will the new NDC commitments cut future transport emissions?

**The updated commitments are still not enough - but they would bring into reach a pathway to containing global warming.** Feeding the transport-related information from the latest available NDCs into the International Transport Forum's global transport models reveals how transport CO<sub>2</sub> emissions would develop if all commitments made in the second round of NDCs were implemented. Figure 3 compares the level of CO<sub>2</sub> emissions in this "NDC scenario" with two other scenarios for 2030, taken from the *ITF Transport Outlook 2021*. In the NDC scenario, transport CO<sub>2</sub> emission levels fall by 2030 – unlike in the "Recover" scenario, which is an extrapolation of the world's transport decarbonisation efforts as known in 2020. The NDC scenario reduces transport CO<sub>2</sub> only marginally less than the "Reshape" scenario, which assumes ambitious decarbonisation policies beyond those in place in 2020 and would bring the 1.5°C goal into reach. Under current NDCs, transport's carbon footprint on a national level would decrease from 5532 million

Metric tons CO<sub>2</sub> equivalent (MtCO<sub>2</sub>e) in 2020 to 5073m MtCO<sub>2</sub>e in 2030, equalling two-thirds of the reduction under the "Reshape" scenario. This requires that all 2030 NDC targets are fully implemented. The NDC scenario also makes optimistic assumptions about the impact of CO<sub>2</sub> reduction measures where quantitative targets have not been defined.

Figure 3. Global national-level transport CO<sub>2</sub> emissions by scenario



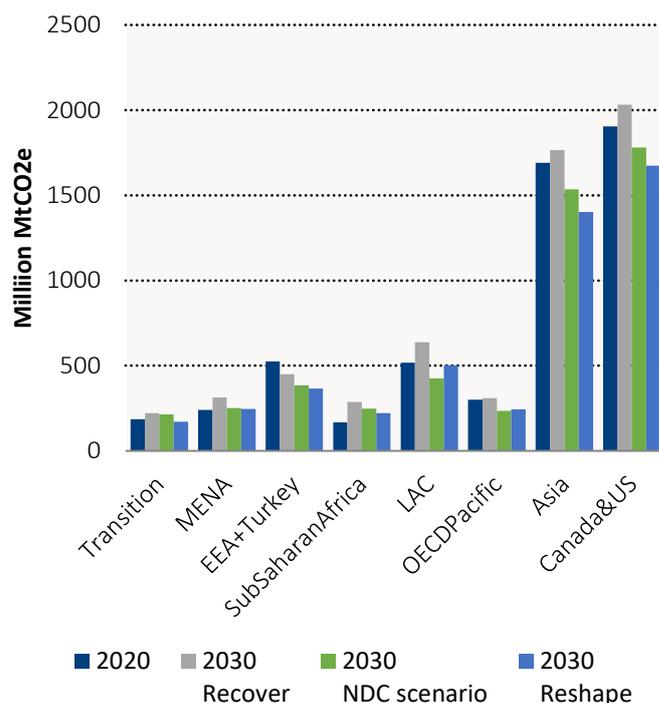
## Who shows most ambition to decarbonise transport?

The decarbonisation commitments of emerging economies are more ambitious on average than those of the big emitters. Figure 4 shows how Latin America (LAC), the Middle East/North Africa (MENA) and the OECD Pacific regions are on track under their current NDC commitments to reduce transport CO<sub>2</sub> even more than in the ambitious "Reshape" scenario of the *ITF Transport Outlook 2021*. The LAC region is set to cut transport CO<sub>2</sub> by almost 18% by 2030 compared to 2020 levels under the NDC scenario, from 518 to 426 million MtCO<sub>2</sub>e, while the reduction under the "Reshape" scenario would be less than 3%.

The decarbonisation targets set by some countries in these regions more than offset weaker commitments by neighbours who sometimes have more carbon-intense economies. Among those with ambitious targets are countries like Chile and Colombia or Mongolia and Nepal. The new NDC commitments of the world's highest-emitting regions also put them closer to a 1.5°C pathway but are not yet enough. Neither the US/Canada region nor Asia will outperform the "Reshape" scenario, based on their second-round NDCs

The least-emitting countries are most strongly committed to decarbonising transport. The 16% of Parties that have laid out a transport decarbonisation target in their NDC account for a mere 6% of global transport CO<sub>2</sub> emissions. Only two of the ten largest emitters have a specific transport-sector CO<sub>2</sub> reduction target, Japan and Canada.

Figure 4. Global national-level transport CO<sub>2</sub> emissions by scenario and region



## Four recommendations

### 1 Set clear mitigation targets for the transport sector

Transport must increase efforts to reduce its CO<sub>2</sub> emissions. In particular, the largest emitters must do more to ensure that the 1.5°C goal of the Paris Agreement will be met. Mentioning transport in national decarbonisation plans is not enough to set a clear path to less CO<sub>2</sub> emissions. Countries should develop transport decarbonisation roadmaps tailored to their specificities. These roadmaps should set quantifiable CO<sub>2</sub> reduction targets and underpin them with mitigation measures that deliver on the benchmark objectives.

### 2 Ensure national decarbonisation plans are fully reflected in the NDCs

Several Parties to the Paris Agreements have developed detailed national plans to decarbonise their

economies and their transport sector, yet have not included these domestic decarbonisation strategies in their Nationally Determined Contributions under the Paris Agreement. As NDCs are the leading international benchmark for national-level decarbonisation efforts, the decarbonisation plans of Parties should be fully reflected in their NDCs.

### 3 Break down silos between transport and related sectors. Include all stakeholders.

Transport is transversal by nature. It is linked to sectors ranging from energy to trade to tourism and many others. The revision process for the next round of NDCs in 2025 must capture the expertise of different industries and transport stakeholders to enhance NDCs with a more comprehensive and robust national decarbonisation strategy. An inclusive approach of consultations with a broad range of stakeholders, including civil society and communities particularly affected by climate change, will create a shared sense of purpose and accountability and improve governance of any national transport decarbonisation strategy.

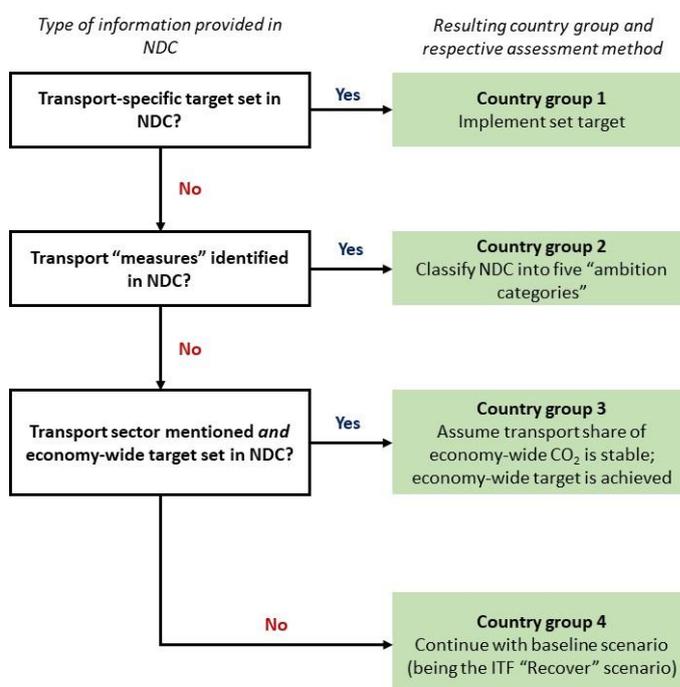
### 4 Enhance co-ordination of climate policy across national ministries

Ministries with responsibility for the environment are typically in charge of climate policy and submitting NDCs to the UN Framework Convention on Climate Change. While input from other ministries is often sought and provided, enhancing exchange and co-ordination further in the preparation of the next round of NDCs will help better reflect needs and opportunities in different sectors.

## A note on methodology

Assessing the impact of transport commitments in NDCs on global transport sector CO<sub>2</sub> emissions is not straightforward. Only 16% of Parties set transport sector-specific CO<sub>2</sub> reduction targets that can be directly used for such an assessment. For all other Parties, assumptions regarding their transport sector ambitions had to be inferred from the information available in their NDCs, and these may not accurately reflect actual aspirations. The assessment method used here is based on a classification of countries into four different groups. For each country group, a distinct method is applied to estimate the likely transport-sector CO<sub>2</sub> reduction ambition. Figure 5 shows the decision tree used to classify the countries and outlines the assessment method for each country group.

Figure 5. Classification of NDCs into country groups



More specifically, the assessment methods for the different country groups are as follows:

**Country group 1** (16% of NDCs): NDCs of countries that fall into this group provide a transport-specific CO<sub>2</sub> reduction target. It is assumed that this target will be met. The achieved transport-sector CO<sub>2</sub> reduction of that country is directly derived. Where the target is defined as a reference to a business-as-usual scenario (BAU), it is assumed that the recover scenario of *ITF Transport Outlook 2021* corresponds to the business-as-usual scenario of the respective country.

**Country group 2** (65% of NDCs): NDCs of these countries do not provide a specific reduction target for transport CO<sub>2</sub>. However, they identify a set of transport measures that will contribute to transport-sector CO<sub>2</sub> reductions if implemented. Countries in

this group are subdivided based on ambition level. The ambition level depends on the exhaustiveness and level of detail of the proposed transport CO<sub>2</sub> reduction measures. Countries with NDCs that provide a high level of detail and a comprehensive set of transport measures are assumed to have a high ambition level. For these, transport-sector CO<sub>2</sub> reductions are assumed to be (70%) in line with the "Reshape" scenario of the *ITF Transport Outlook 2021*. In the "Reshape" scenario, countries achieve a decarbonisation pathway that puts the 1.5°C goal of the Paris Agreement into reach. If ambition levels are lower because the proposed measures are less detailed or less exhaustive, CO<sub>2</sub> reductions in transport are assumed to be lower than in the "Reshape" scenario (i.e. ranging from 0% to 50% of the reductions achieved in the "Reshape" scenario).

**Country group 3** (15% of NDCs): NDCs of these countries neither provide transport-specific targets nor mitigation measures. However, they mention transport as a relevant sector for reducing CO<sub>2</sub> emissions and provide an economy-wide CO<sub>2</sub> reduction target. In the absence of any further information regarding the transport sector, it is assumed that the share of transport sector CO<sub>2</sub> emissions will remain stable over time. The economy-wide CO<sub>2</sub> reduction target is assumed to also apply to the transport sector and be achieved by 2030.

**Country group 4** (3% of NDCs): NDCs of these countries either do not mention the transport sector or do not provide any further detail on a specific transport-sector target, on transport mitigation measures, or an economy-wide target. In the absence of any such additional information, it is assumed that transport-sector emissions will grow in line with the countries' baseline scenarios, that is, the "Recover" scenario of the *ITF Transport Outlook 2021*.

## Further reading

[Transport CO<sub>2</sub> and the Paris Climate Agreement: Reviewing the impact of Nationally Determined Contributions](#) (ITF, 2018)

[ITF Transport Outlook 2021](#) (ITF, 2021)

[NDC Registry](#) (UNFCCC, 2021)

[Transport Policy Matters](#) (blog)

## About this project

This paper was produced as part of the International Transport Forum's Decarbonising Transport initiative (DTi) in its workstream 1, "Tracking Progress". The authors of this paper are Aurélie Kopacz, María Santos Alfageme and Elisabeth Windisch (project lead).

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## **Transport CO<sub>2</sub> and the Paris Climate Agreement:**

Where Are We Six Years Later?

This paper takes stock of how transport figures in national decarbonisation strategies six years after the Paris Agreement. Have more countries defined decarbonisation targets for the sector? Are these more ambitious than they were in the first Nationally Determined Contributions submitted in 2016?

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