

Intended Nationally-Determined Contributions (INDCs) Offer Opportunities for Ambitious Action on Transport and Climate Change

Preliminary Analysis¹ - Partnership on Sustainable Low Carbon Transport - October 19, 2015

Key Findings

Intended Nationally-Determined Contributions (INDCs) represent a unique opportunity to increase bold mitigation and adaptation measures in transport and other sectors, as for the first time, Parties to the United Nations Framework Convention on Climate Change (UNFCCC) countries are communicating their commitment to reduce emissions and increase resilience on sectoral scales in the context of the UNFCCC system.

Among 120 INDCs submitted as of October 6, 2015, 76% explicitly identify the transport sector as a mitigation source, and more than 60% of INDCs propose transport sector specific mitigation measures. In addition, 11% of INDCs include a transport sector emission reduction target, and 15% of INDCs include assessments of country-level transport mitigation potential.

Transport related actions in the INDCs are heavily skewed towards passenger transport, which is included in 88% of INDCs identifying specific transport modes. Among these, urban transport measures are mentioned in 85% of INDCs, while strategies such as high-speed rail (2%), and walking and cycling (13%) have received relatively less attention.

At an economy-wide scale, INDCs are expected to collectively fall short of the two-degree Celsius scenario (2DS). The same applies to the transport sector; based on existing policies and levels of ambition expressed in INDCs, it is not currently *likely* that the transport sector will attain a 2DS. This is in contrast with a preliminary SLoCaT analysis, which suggests that the transport sector has *potential* to attain a 2DS. To realize this transport mitigation ambition in INDCs will be needed to be ratcheted-up and additional measures are to be prioritized in INDC implementation strategies.

Adaptation, although being mentioned in an economy-wide scope in 96 of 120 INDCs submitted to date, has generally received less attention than mitigation in INDCs. The

¹ This preliminary analysis of INDCs in the transport sector is intended to inform discussions at the ADP 2-11 session in Bonn in October 2015, and is to be developed further before COP21 in December 2015.

transport sector is mentioned in general terms among climate adaptation measures in only 13% of INDCs, and 4% of countries identify transport-specific adaptation strategies.

Transport sector emissions trends and mitigation potential

The transport sector is responsible today for approximately 23% of total energy-related CO₂ emissions, and therefore represents a critical sector for climate action. A recent SLoCaT Partnership [analysis](#)² reveals that transport is the largest energy-consuming sector in 40% of countries worldwide, and the second-largest energy-consuming sector in most of the remaining countries. The global transport sector emitted about 8.7 gigatonnes (Gt) CO₂e in 2012.

Transport, with an average annual growth rate of 2% from 1990-2012, is among the fastest growing sectors of CO₂ emissions from fuel combustion, with passenger transport accounting for nearly 60% and freight transport accounting for 40% of total transport energy demand in 2012.³ Urban transport constitutes 40% of total transport energy consumption⁴ and is poised to double by 2050⁵, despite ongoing vehicle technology and fuel-economy improvements.

In the absence of aggressive mitigation policies, transport emissions could reach about 12 Gt CO₂e annually by 2050; however, to meet a 2DS scenario, CO₂ emissions from transport must decline to 5.7 Gt by 2050.⁶ The transport sector offers considerable potential for climate change mitigation. The IPCC states that a 15-40% reduction of CO₂e from the transport sector is plausible by 2050 compared to baseline growth.⁷ The United Nations Environment Programme (UNEP) [2014 Emissions Gap Report](#)⁸ estimates that the transport sector has the potential to contribute up to 3 Gt CO₂e annually in the period to 2020 towards needed reductions. Furthermore, the New Economy Report indicates that transport represents roughly a third of global urban mitigation potential in the period leading up to 2050.⁹

INDC Background and Process

INDCs communicate to the UNFCCC secretariat country-level commitments and strategies to reduce carbon emissions and increase resilience for the post-2020 period¹⁰. 'Intended' refers to planned commitments. 'Nationally Determined' acknowledges that each country faces a unique set of circumstances influencing reduction strategies,

² SLoCaT Partnership. 2015. Differentiating National Transport Sector Emissions Trends to Better Inform National Targets and Implementation Strategies. <http://goo.gl/jqnQ82>

³ International Energy Agency (2014), Tracking Clean Energy Progress 2014.

⁴ Sims R., et al. Transport (chapter). Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 2014.

⁵ Policy Pathways: A Tale of Renewed Cities, IEA, 2013

⁶ https://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter8.pdf and International Energy Agency (2014), Tracking Clean Energy Progress.

⁷ https://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter8.pdf

⁸ <http://www.unep.org/publications/ebooks/emissionsgapreport2014/>

⁹ PPMC. 2015. Investing in Sustainable Transport Can Save Cities Up To \$500bn by 2030, Says New Climate Economy Report. <http://ppmc-cop21.org/?p=1754>

¹⁰ http://unfccc.int/focus/indc_portal/items/8766.php

including socio-economic development patterns, historic emission trajectories, and varying financing requirements.

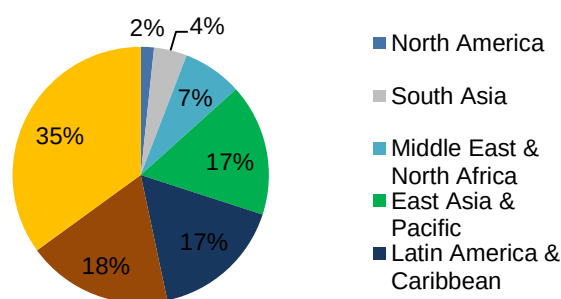
INDCs represent a departure from the top-down approach taken in the UNFCCC process till COP15 Copenhagen in setting country specific targets on climate change mitigation. They introduce a bottom-up process to define country-level mitigation and adaptation efforts that are guided by national development priorities, equity, and common responsibility. Since INDCs represent a bottom-up, nationally determined process, they have the potential to drive progress in countries, especially in the global south, that are shaping emerging climate policies.

To be effective in helping to arrive at an ambitious global agreement in December 2015 in Paris, INDCs were to be communicated by each Party to the UNFCCC secretariat well in advance of COP21 Paris. The information to be provided in INDCs may include quantifiable information on base years, time frames and/or periods of implementation, scope and coverage assumptions and methodological approaches to mitigation and adaptation actions for the period between 2020 and 2030. Levels of ambition in INDCs are to be 'ratcheted up' in subsequent periods of evaluation, with re-evaluation intervals (e.g. 5- or 10-year periods) still under discussion within the UNFCCC process.¹¹

Therefore, INDCs represent a unique opportunity to increase bold mitigation and adaptation measures in transport and other sectors, as for the first time in history, countries are communicating their intended actions to reduce emissions and increase resilience on sectoral scales in the context of the UNFCCC system.

INDCs Analysis¹²

Overview



As of October 6, 2015, 120 INDCs representing 147 countries had been submitted, which represent about 87% of economy-wide global greenhouse gas emissions¹³. Figure 1 gives a breakdown of INDCs submitted by geographical region¹⁴:

¹¹ The UNFCCC secretariat is to prepare by 1 November 2015 a synthesis report on the aggregate effect of the INDCs communicated by Parties by 1 October 2015.

¹² The analysis presented in this section is based on review of INDCs submitted till date. For details see Annex I as well a more detailed assessment by country at <http://www.slocat.net/docs/1503>.

¹³ UNFCCC Newsroom. 2015. Unprecedented Global Breadth of Climate Action Plans Ahead of Paris. <http://bit.ly/1Pf1fq7>

¹⁴ Regional breakdown is based on World Bank classification, in which 'North America' includes Bermuda, Canada and the United States, and 'Latin America & Caribbean' includes Mexico, Central America, South America, and Caribbean countries.

Figure 1: INDCs by Geographical Region

Transport Mitigation Measures and Targets

Among the 120 INDCs submitted to date, 76% explicitly identify the transport sector as a mitigation source, while in a further 20% of INDCs; the transport sector has not been explicitly identified but is considered as an intrinsic part of energy sector. Among all INDCs submitted to date, only 4% (including Belarus, Comoros, Guinea Bissau, Guyana, Sao Tome and Principe) make no reference to transport sector mitigation.

Transport Mitigation Measures by Mode

50% of INDCs identify specific transport modes required for emission reductions. Figure 2 gives a breakdown of relative focus on passenger and freight transport in INDCs, in addition to describing the number of INDCs focusing on various transport sub-sectors.

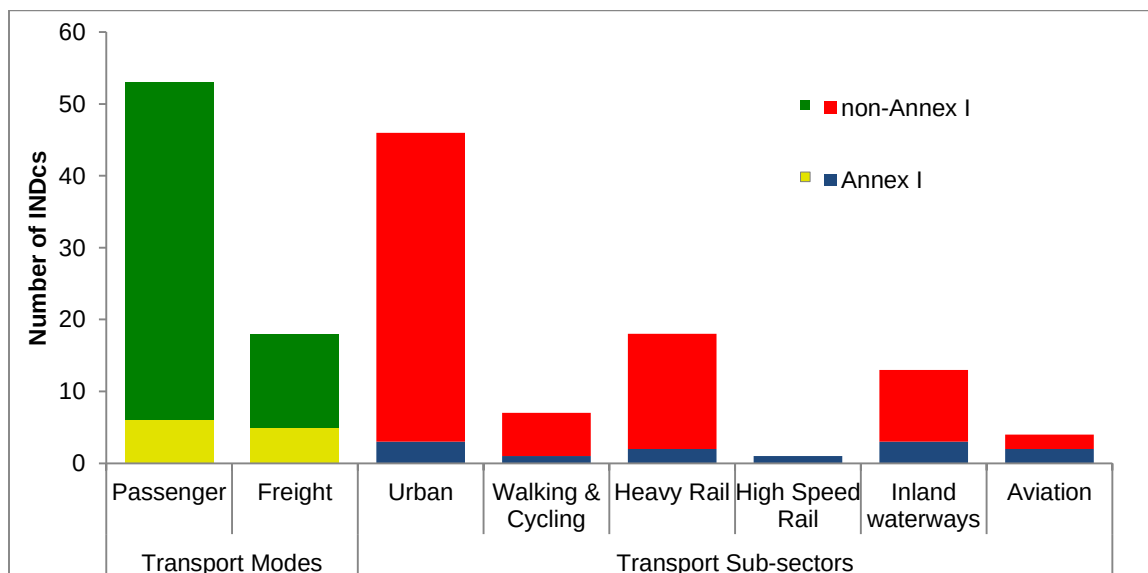


Figure 2: Share of Mitigation Measures by Mode in INDCs

INDC transport mode share is heavily dominated towards passenger transport, which is included in 88% of INDCs identifying specific transport modes. Among passenger transport modes, urban transport measures are mentioned in 85% of measures, with a range of transport interventions proposed to facilitate rising urbanization. High-speed rail (2%), and walking and cycling (13%) have received relatively less attention among passenger transport mitigation strategies.

Freight is currently neglected across the INDCs, included in just 30% of INDCs identifying specific transport modes. Although in terms of energy consumption, current passenger and freight mode shares are about 60% and 40%, respectively,¹⁵ recent

¹⁵International Energy Agency. 2015. Tracking Clean Energy Progress 2015. <http://bit.ly/1FMWLNx>

estimates suggest that freight demand (in ton-km) could increase by 350% between 2010 and 2050 in the absence of policies to improve freight efficiency¹⁶. This would justify a greater emphasis on freight related measures in INDCs.

Transport Mitigation Actions by Non-State Actors in the Transport Sector

Non-state actors are making valuable contributions to transport mitigation actions in parallel to country-level efforts, outlined in the INDCs. The Lima-Paris Action Agenda (LPAA) includes a set of voluntary commitments made during and since the 2014 Secretary General's Climate Summit, which provide examples of non-state actors taking concrete measures to complement INDC proposals.

LPAA voluntary transport commitments include, among others, the following initiatives:¹⁷

- The **Airport Carbon Accreditation** initiative aims to reduce carbon emissions and achieve best practices in carbon management at airports.
- The **C40 Clean Bus Declaration of Intent** is designed to help manufacturers and other stakeholders to make advanced bus technologies more affordable for cities.
- The **Global Green Freight** Action Plan promotes the development of green freight programs.
- The **ICAO/ATAG Climate Action in Aviation** initiative promotes short, medium and long-term goals to cut emissions from aviation.
- The **International Zero Emissions Vehicle Alliance** encourages an accelerated adoption of Zero-emission vehicles.
- The **ITS for the Climate** initiative focuses on the use of Intelligent Transport Services to reduce CO₂ emissions from transport.
- The **Navigating a Changing Climate** Initiative promotes a shift towards low-carbon inland and maritime navigation infrastructure.
- The **UIC Low Carbon Sustainable Rail Transport Challenge** calls for energy and CO₂ emission reductions and a greater mode share for rail transport.
- The **UITP Declaration on Climate Leadership** encourages member public transport agencies to reduce carbon emissions and strengthen resilience within their cities and regions.
- The **Action Platform on Urban Electric Mobility (UEMI)** is an initiative to increase the market share of electric vehicles in cities to at least 30% of all new vehicles sold by 2030.
- The **MobiliseYourCity** partnership helps local governments in developing countries plan sustainable urban mobility, to reduce GHG emissions and develop more efficient cities.
- The **Vehicle Fuel Efficiency Accelerator** aims to double fuel economy and reduce fuel waste.
- The **World Cycling Alliance (WCA)/European Cyclists' Federation (ECF)** seeks to increase modal shift to cycling worldwide and double cycling mode share in Europe by 2020.

Transport Mitigation Measures by Type

Generally, low carbon transport interventions can be categorized using the 'Avoid-Shift-Improve' (ASI) typology. 'Avoid' strategies address planning related interventions to reduce motorized travel; 'Shift' strategies transfer travel activity to more energy-efficient modes; and 'Improve' strategies focus on increasing vehicle energy efficiency and decarbonizing transport energy sources.

Figure 3 indicates that the majority of proposed measures (about 60% of nearly 200 proposed mitigation measures) in INDCs are 'Improve' strategies (which are largely

¹⁶International Transport Forum. 2014. ITF Transport Outlook: Scenarios to 2050. <http://bit.ly/1ZBFggO>

¹⁷ <http://ppmc-cop21.org/transportinitiatives/>

technology-focused solutions). This focus on technological measures helps to explain that INDCs as formulated at present do not optimize mitigation potential of the transport sector. As indicated in the 5th IPCC Assessment Report, an integrated set of ‘Avoid’ and ‘Shift’ strategies (e.g. urban development and infrastructure investment, linked with more compact urban form to support cycling and walking), as well as technological measures could potentially reduce GHG intensity by 20–50% below a 2010 baseline by 2050.¹⁸

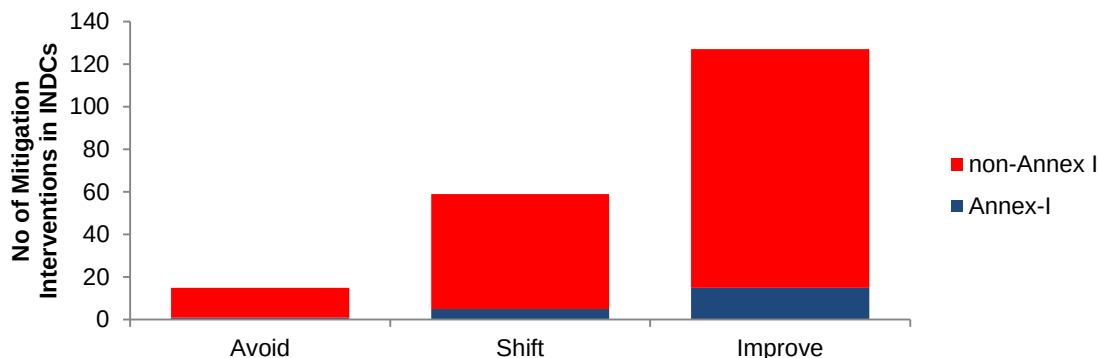


Figure 3: Typology of Transport Mitigation Interventions in INDCs

Error! Reference source not found. gives a breakdown of specific transport mitigation strategies, with priority varying among countries of different income categories. While fuel economy standards and e-mobility are prioritized in high-income countries, middle and low-income countries largely rely on public transport improvements (especially bus-based systems) and decarbonizing measures (e.g. biofuels). Further, low and middle-income countries tend to prioritize import restrictions based on vehicle age (e.g. Gabon) along with instruments to improve fleet fuel efficiency (e.g. eco-driving in Cambodia, fuel efficient vehicle incentives in Grenada and Cameroon).

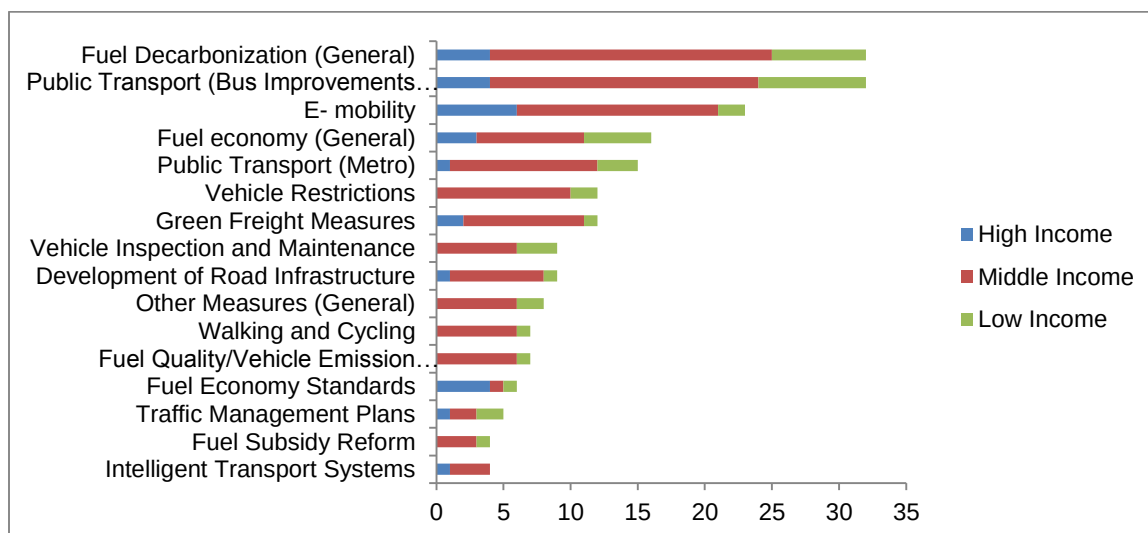


Figure 4: Share of Transport Mitigation Strategies

¹⁸ IPCC Fifth Assessment Report. https://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter8.pdf

Middle-income countries are also prioritizing improvement in inspection and maintenance, fuel quality and vehicle emission standards, which could provide significant reductions in air pollutants. In addition, proposed green freight measures involve shifting from road to railways and waterways.

About 4% of countries (including the Central Africa Republic, Chile, Mauritius) include in their INDCs plans to reduce short-lived climate pollutants (SLCPs) by controlling black carbon emissions from the combustion of fossil fuels, which will help to manage a significant contributor to short-term climate-warming potential while simultaneously reducing harmful effects on health, agriculture and ecosystems.

Subsidized fossil-fuel use accounted for 14% of total global CO₂ emissions in 2012, and the cost of such subsidies totaled \$510 billion in 2014.¹⁹ A recent analysis from IEA suggests that to deliver a peak in global energy-related emissions by 2020, it is essential to eliminate fossil-fuel subsidies in net importing countries within the next 10 years, which would provide a emission reduction of about 160 Mt CO₂e in 2020²⁰. However, among 120 countries with INDCs, only four (Ethiopia, India, Morocco, Viet Nam) include fuel subsidy reduction among their proposed mitigation strategies.

The transport sector can also benefit from decarbonizing efforts in the electricity sector, with many countries including measures in INDCs to expand e-mobility (e.g. Barbados and Republic of Korea to provide tax incentives for electric vehicles; and Kiribati, Marshall Islands, and New Zealand to increase use of renewable energy in the transport sector). IEA estimates that renewable energy could become the leading source of electricity by 2030 and the carbon intensity of the power sector is projected to improve by 30% during the same period²¹. More than 100 countries having established renewable energy targets over the last decade will help this²². Among current INDCs, about one third have established renewable energy targets in the electricity sector.

In total, there are 73 countries with transport emission interventions proposed, out of which, 19 countries have proposed 4 or more strategies. 41 countries have proposed 1 or 2 interventions. Countries proposing varied transport mitigation measures to increase their overall mitigation potential can be found at all levels of development, including low-, middle-, and high-income countries (e.g):

- **Benin** has pledged as part of its INDC to improve traffic flow in large cities; introduce duty relief for taxes on public transit vehicles; develop a river-lagoon transport system with navigable rivers; modernize and extend its rail infrastructure; and further develop its urban public transport (low-income).
- **Jordan's** proposed transport measures include increasing public transport mode share to 25% by 2025; reducing vehicle fuel consumption and emissions; and

¹⁹ International Energy Agency. 2015. Energy and Climate Change - World Energy Outlook Special Report. <http://bit.ly/1FW2d1Y>

²⁰ International Energy Agency. 2015. Energy and Climate Change - World Energy Outlook Special Report. <http://bit.ly/1FW2d1Y>

²¹ International Energy Agency. 2015. Energy and Climate Change - World Energy Outlook Special Report. <http://bit.ly/1FW2d1Y>

²² IRENA. 2015, Renewable Energy Target Setting. <http://bit.ly/1RGg90i>

reducing motorized vehicle travel, particularly in densely populated areas (upper middle-income).

- **Japan's** proposed transport measures include promoting modal shift to public transport and railways; improving fuel efficiency, and promoting next-generation automobiles; improving traffic flow; promoting eco-driving and car sharing; and introducing low-carbon aviation and maritime strategies (high-income).

Transport Emission Targets in INDCs

While over 60% of INDCs propose (general or specific) transport sector mitigation measures; 13 INDCs (11%) have proposed a transport sector emission reduction target. In addition, 10% of INDCs include country-level transport business-as-usual (BAU) emission projections, and 15% of INDCs include estimates of country-level transport mitigation potential.

Why Are There Only Few Transport Emission Reduction Targets in INDCs

Emissions impacts of transport policies are difficult to quantify when compared with other energy consuming sectors, since there is a great diversity of transport mitigation strategies among individual countries. In addition, there exist limited data on vehicles, usage, fuel, and per-kilometer CO₂ emissions in developing countries²³. For these reasons, many countries have traditionally focused on energy sector-related measures to set reduction targets, with nearly one third of INDCs establishing renewable energy targets in the electricity sector.

Countries often do not allocate emissions targets to specific sectors (including transport) as they do not know the costs and benefits of comparative sectoral reductions. Thus, the 2030 targets established in INDCs of most countries are generally economy-wide, and are often not represented as a single unconditional value, but rather as a range of values or a conditional value. In some cases this is due to the fact that countries prefer to have flexibility in operationalizing their INDC commitment, and in other cases conditional commitments hinge on external funding (especially in the case of developing countries)²⁴.

The low prioritization of the transport sector relative to the energy sector among INDCs reflects ongoing discussion from a recent technology needs assessment report, in which 90% of Parties prioritized the energy sector as an areas of need, and within the energy sector, the transport sector was prioritized among only 41% of Parties.²⁵ In addition, fuel switch was among the highest-priority technology categories in the transport subsector, which is consistent with the fact that decarbonizing fuel is the most often proposed transport sector mitigation strategy in INDCs (along with bus improvements) (Figure 4).

(* = conditional reduction target)

²³ Due to this complexity, the sustainable transport sector has traditionally received less attention than other sectors in climate finance.

²⁴ UNFCCC. 2013. Quantified economy-wide emission reduction targets by developed country Parties to the Convention: assumptions, conditions, commonalities and differences in approaches and comparison of the level of emission reduction efforts. <http://bit.ly/1MxY5ME>

²⁵ UNFCCC. 2013. Third synthesis report on technology needs identified by Parties not included in Annex I to the Convention. <http://bit.ly/1LteZuS>

Table 1 provides a comparison of *direct* transport-specific emission targets with economy-wide targets. Burkina Faso and Trinidad and Tobago have set transport reduction targets that are at least twice as intensive as economy-wide emission reduction targets.

Country	Transport CO2 Reduction Target	Economy-wide CO2 Reduction Target
Bangladesh	24% reduction from 2030 BAU	15% below BAU (power/transport/industry)*
Burkina Faso	42% below BAU	18.2% reduction below BAU
D.R. Congo	10Mt CO2e reduction (urban transport)	17% below BAU by 2030
Dominica	16.9% below 2014 levels by 2030	44.7% by 2030 under 2014 levels
Ethiopia	10 MT by 2030	64% compared to BAU in 2030*
Gabon	20% reduction below 2025 BAU	At least 50% reduction from BAU by 2025
Grenada	20% reduction below 2010 by 2025	30% reduction below 2010 levels by 2025
Ivory Coast	5.73% reduction below 2030 BAU	28% reduction from 2030 BAU scenario
Japan	27% below 2013 by 2030	26% by FY 2030 compared to 2013
Marshall Islands	27% below 2010 in 2030	32% below 2010 levels by 2025
Moldova	15% below BAU by 2020	78% reduction below 1990 by 2030*
Seychelles	30% reduction by 2030 from BAU	29% below BAU by 2030
Trinidad/Tobago	30% reduction by 2030 from BAU	15% below BAU by 2030*

(* = conditional reduction target)

Table 1: Comparison of Direct Emission Reduction Targets (Economy-wide and Transport)

In addition, a number of countries have established *indirect* transport emission reduction targets in their INDCs, which target variables such as public transport mode share, renewable energy share, fuel consumption reduction, or fuel efficiency as a means to reach desired emission reductions (Table 2).

Country	Indirect Transport Sector targets
Barbados	29% reduction in non-electric energy consumption (including transport) in 2030 compared to BAU
Bangladesh	Shift in passenger traffic from road to rail of up to around 20% by 2030 compared to BAU; 15% improvement in vehicle efficiency
Belize	Minimum 20% reduction in conventional transportation fuel use by 2033
Burkina Faso	42% lower consumption of oil in transport
Canada	Renewable fuels regulations require that gasoline contain an average 5% renewable fuel content and that most diesel fuel contain an average 2% content
China	Promote share of public transport in large-and medium-sized cities, targeting 30% by 2020
Congo	Limit transport energy consumption growth to 70% of baseline by 2025
India	Increase share of railways in total land transport from 36% to 45%
Israel	20% mode shift from private to public transport
Jordan	Increase public transport mode share to 25% by 2025. Deploy 3,000 charging stations to support 10,000 ZEVs by the private sector
Lao PDR	Increase share of biofuels to meet 10% of demand for transport fuels by 2025
Liberia	Blend up to 5% of palm oil biodiesel with both gasoline and diesel by 2030 for vehicle fuels
Malawi	Increase number of public transport users by 30%
Morocco	Reduce energy consumption in transport 23% by 2030
Mongolia	Increase share of private hybrid vehicles from about 6.5% in 2014 to about 13% in 2030

Country	Indirect Transport Sector targets
Namibia	Commission mass transport system in Windhoek to reduce number of private cars and taxis by about 40%
Republic of Korea	Strengthen the average emission standard from 140g/km in 2015 to 97g/km in 2020
South Africa	Investment in public transport to grow at 5% per year
Seychelles	30% reduction in transport fuel use
Togo	20% fossil fuel reduction in road transport

Table 2: Indirect Transport Sector Emission targets

Measuring the impact of Transport Targets and Measures vis-à-vis 2 Degree Scenario

A quantitative assessment of the transport targets and measures in the INDCs vis-à-vis the 2 Degree Scenario is difficult for two main reasons: (a) many countries are not including all existing and potential transport related policies and measures in the INDCs. As a consequence impact assessment of transport components in the INDCs will fall short potential as well as actual emission reductions realized by 2030; (b) Measuring, Reporting and Verification mechanisms for the transport sector under the UNFCCC are generally weak.

Measurement, Reporting and Verification of INDC Commitments

The 2007 Bali Action Plan defined the principle of measurement, reporting and verification (MRV) for both developed and developing countries. This principle was further improved through a number of subsequent Conference of the Parties (COP) decisions, resulting in a comprehensive MRV framework under the UNFCCC. National communications (NCs), biennial reports (BURs) and biennial update reports (BURs) are at the heart of the MRV framework to mark progress in the implementation of the UNFCCC.

However, based on a review of 85 NCs and 50 BURs/BRs submitted to UNFCCC, it was found that only about 65% of NCs and 80% of BURs include transport emissions projections, and only about 50% of NCs include transport activity data.²⁶ Thus, it is necessary to ensure that transport data are fully incorporated in NCs/BURs – and that these be submitted at regular intervals and based on recent emissions reporting – to facilitate effective MRV of transport sector contributions toward INDC implementation.

The general assessment is that INDCs are not ambitious enough and that implementation of currently proposed economy wide targets and measures will not keep emissions below the 2 Degree Scenario. This applies to the transport sector as well. A forthcoming SLoCaT report on post-2020 measures will provide a more detailed assessment of transport mitigation potential relative to achieving a 2DS. This analysis will be based on a bottom-up quantification of emission reduction potential done by different institutions for 60 countries representing more than 60-70% of global transport CO₂ emissions. Initial results indicate that deep reductions in the transport sector appear to be feasible to the extent that the transport sector could be on track to be largely in compliance with the 2 Degree Scenario.

²⁶ This analysis corroborates the evidence presented in the UNFCCC sixth review of non-Annex I national communications that "regarding energy use, most Parties reported broadly or specifically on the lack of activity data on household biomass consumption, vehicles and equipment efficiency in the transport and industrial subsectors, and international bunker fuels."

Transport Mitigation Investment Requirements

Investment required for the transport sector to achieve desired mitigation goals is highlighted in about 12% of INDCs, and for countries with transport sector emission targets, 23% of INDCs provide investment estimates. In addition, 8% of INDCs make explicit reference to transport mitigation strategies using quantitative approaches such as cost-benefit analysis, multicriteria analysis, co-benefits and marginal abatement curves, which can help to further support investment needs analysis.

Table 3 gives examples of projected investment requirements to implement proposed transport mitigation measures among INDCs.

Country	Priority Transport Projects	Investment Requirements
Bangladesh	Dhaka MRT and elevated highway	5.3 billion USD (2011-2030)
Benin	Development of intra- and inter-urban transit	2.78 billion USD (2011-2030)
Burkina Faso	Improvement of public transport; use of biofuel	98 million USD
Eritrea	Improve rail and bus transport	1 billion USD
Lao PDR	Implementation of Transport NAMA	105 million USD (2015-2020)
Lesotho	Improvement of vehicle efficiency, modal shift to public transport	Additional investment of 1.5 million USD (2020), 2.0 million USD (2030)
South Africa	1. Electric vehicles 2. Hybrid electric vehicles (20% by 2030)	1. 513 billion USD (2010-2050) 2. 488 billion USD
Togo	Promotion of low carbon transport modes	40 million USD

Table 3: Transport Sector Investment Requirements Included in INDCs

Increasing details on needed investments can help to ensure that bold transport measures proposed in INDCs will be matched with required sources of funding (e.g. public or private sector finance, climate finance instruments, development banks).

Global transport investment could be significantly scaled up through fossil fuel subsidy reform. To this end, several countries have included fossil fuel subsidy reform in their INDCs (e.g. India, Morocco, Viet Nam). Introducing a fossil fuel extraction levy could provide up to \$50 billion annually for sustainable transport and other mitigation activities.²⁷

Transport Adaptation Measures

Adaptation in the transport sector is necessary for developed and developing countries, as transport systems worldwide are vulnerable to increasing impacts of extreme weather, and rapid urbanization and motorization increase the potential for catastrophic impacts. Sustainable transport systems must adapt to climate change to maintain reliability and increase ridership, and thus to achieve full mitigation potential. However, adaptation is generally less well developed than mitigation in the transport sector.

Adaptation has generally received less attention than mitigation in INDCs, although being mentioned in an economy-wide scope in 96 of 120 INDCs submitted to date. The transport sector is mentioned in general terms among climate adaptation measures in 13% of INDCs, and 4% of countries identify transport-specific adaptation strategies,

²⁷ "Dollars," ECO NGO Newsletter 3.

which focus mainly on vulnerability assessments and infrastructure resilience planning (Table 4).

Country	Transport-Specific Adaptation Measures
Belize	Vulnerability assessment of transport infrastructure, particularly in urban areas and areas critical to sustaining the country's productive sectors (tourism, agriculture and ports).
Gambia	Improved resilience of road networks under changing climate conditions.
Madagascar	Effective application of existing or newly established sectorial policies, including flood-resistant terrestrial transport infrastructure standards.
Maldives	Coastal protection measures to protect the shoreline of Hulhule, the island which contains Ibrahim Nasir International Airport, as well as for other air and sea ports.
Republic of Moldova	Analyzing adaptation options, including altering assumptions about infrastructure design and operations, and incorporating uncertainty into long-range decision making.

Table 4: Transport-Specific Adaptation Measures in INDCs

Raising the profile of transport adaptation measures in the elaboration of current INDCs as well as future iterations of INDCs can help to ensure that investments in mitigation measures are well-protected, which can be achieved by incorporating in INDCs a growing number of transport adaptation and resilience efforts currently underway at national and regional levels.²⁸

Conclusions and Recommendations

Conclusions

- INDCs open the door for more ambitious action on transport and climate change, allowing the transport sector to make a substantive contribution to economy-wide emission reductions.
- INDCs mark the first instance of defining country-driven sector-specific contributions through the United Nations Framework Convention on Climate Change (UNFCCC).
- INDCs present an opportunity to raise collective mitigation and adaptation ambition through context-appropriate low-carbon transport strategies, as demonstrated in bold submissions from countries across regions and at varying levels of development.
- Proposed transport mitigation *measures* are featured in more than half of submitted INDCs, which focus primarily on urban transport, heavy rail, and waterways, and secondarily on freight transport, walking and cycling and high-speed rail.
- Transport sector *targets* (with varying baselines) have been included in a smaller number of INDCs, including both *direct* GHG emission reduction targets, and *indirect* targets based on transport mode share, renewable energy share, or fuel efficiency.
- Transport related targets and measures in INDCs do not reflect the full mitigation potential that exists according to a preliminary SLoCaT analysis, which is expected to show that transport emissions in countries with INDCs submitted to date

²⁸ See forthcoming paper by SLoCaT Partnership that will provide an overview of the rapidly growing knowledge base on adaptation to climate change in transport, as well as growing number of toolkits and (pilot) projects (e.g. [Adaptation Approaches for the Transport Sector in Cambodia](#)).

(representing about 80% of 2010 global *transport sector* emissions) could reach by 2030 be largely in line with a 2DS if countries would intensify implementation of low carbon transport policies as defined in a series of emission scenario planning studies.

- Transport adaptation measures generally contain less detail than mitigation measures in INDCs submitted to date, reflecting a similar prioritization of adaptation in economy-wide proposals.

Recommendations

- Ratcheting up transport sector measures and levels of ambition in successive INDC revisions can maximize sectoral leverage to reduce economy-wide emissions.
- Incorporating a balanced approach to transport mitigation in INDC implementation plans, including integrated 'Avoid,' 'Shift,' and 'Improve' strategies, can create multiplier effects, and could increase overall impact
- Quantifying investment requirements for proposed low-carbon transport measures in INDC implementation plans is a key step towards generating needed funding. Strategies to generate additional funding could be complemented by elimination of fossil fuel subsidies, which could then be invested in sustainable transport measures.
- Compiling country-level transport data at more regular intervals could facilitate more effective measurement, reporting and verification (MRV) of transport sector contributions in INDC implementation. Emerging technologies could help to improve the quality, frequency, and affordability of collecting and analyzing transport data.
- INDCs could spur regional dialogues among countries to implement a more comprehensive set of transport measures, based on common demographic trends and development priorities. This could benefit ratcheting up transport mitigation and adaptation measures in INDCs.
- INDCs could be used to stimulate 'matchmaking' among national and sub-national entities. INDCs represent 'demand-side' commitments that can be complemented by 'supply-side commitments' (e.g. low-carbon transport commitments under the [Lima-Paris Action Agenda \(LPAA\)](#)²⁹.
- The global sustainable transport community could support countries in shaping detailed implementation plans for general mitigation and adaptation strategies proposed in INDCs. Global expertise could be leveraged to help refine and expand country context-sensitive transport specific mitigation and adaptation strategies.
- Parties could further leverage emerging quantitative tools to help optimize transport sector mitigation ambition in INDCs. The [Paris Process on Mobility and Climate \(PPMC\)](#) is creating a set of [knowledge products](#), that can be used to assist national

²⁹Lima-Paris Action Agenda. <http://newsroom.unfccc.int/lpaa/> and www.ppmc-cop21.org/transport commitments.

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climate planning entities in determining transport sector mitigation potential and ratcheting up transport mitigation targets in successive iterations of INDCs.

Annex I: Transport Measures in INDCs (as of October 6, 2015)

Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
<u>Afghanistan</u>		13.6% below 2030 business as usual (BAU) scenario	No Information	More efficient vehicles, clean fuels, and alternative fuels.
<u>Albania</u>	11.5% below 2030 BAU scenario		No Information	No Information
<u>Algeria</u>	7% below 2030 BAU scenario	Up to 22% reduction by 2030	No Information	Increased share of liquefied petroleum gas and natural gas in fuel consumption between 2021 and 2030.
<u>Andorra</u>	37% below 2030 BAU scenario		No Information	No Information
<u>Argentina</u>	15% below 2030 BAU scenario	30% below 2030 BAU scenario	No Information	Reactivation of passenger and cargo railways, renewal and improvement of rail infrastructure, and incorporation of technologies and services to contribute to the modernization and efficiency of the rail public transport system.
<u>Armenia</u>	Limit to 633 MtCO ₂ e by 2050		No Information	Development of electric transport.
<u>Australia</u>	26% to 28% below 2005 levels by 2030		No Information	National Energy Productivity Target of a 40% improvement between 2015 and 2030, (with an investigation of opportunities to improve the efficiency of light and heavy vehicles.

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Country	Economy-wide Target (unconditional)	Economy-wide Target (conditional)	Transport Sector Target	Summary of Proposed Transport Measures
Azerbaijan	35% below 1990 levels by 2030		No Information	- Use of environmentally friendly forms of transport; - Enhancement of the use of electric vehicles for public transport; - Electrification of railway lines and the transition to alternative current system in traction; - Improvement and expansion of the scope of intellectual transport management system; - Development of metro transport and increase in number of metro stations; - Elimination of traffic jams through construction of road junctions and underground and surface pedestrian crossings.
Bangladesh	Reduce GHG emissions in the power, transport, and industry sectors by 12 MtCO ₂ e by 2030 or 5% below BAU emissions for those sectors	Reduce GHG emissions in the power, transport, and industry sectors by 36 MtCO ₂ e by 2030 or 15% below BAU emissions for those sectors	24% deduction from 2030 BAU	- Modal shift from road to rail delivered through a range of measures including underground metro systems and bus rapid transit systems in urban areas. Co-benefits will include reduced congestion, improved air quality and improved traffic safety. - Reduced congestion and improved running of traffic. This will be achieved by a number of measures, including building of expressways to relieve congestion and public transport measures.
Barbados	44% below 2030 BAU scenario		No Information	Investigate alternative vehicles and fuels such as compressed natural gas, liquid petroleum gas, ethanol, natural gas, hybrid and electric vehicles, and encouraging their adoption through tax incentives.
Belarus	28% below 1990 levels by 2030		No Information	No Information

Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
Belize		Reduction of 24 million metric tons of CO ₂ e over the period 2014-2033.	No Information	Achieve at least a 20% reduction in conventional transport fuel use by 2033 and promote energy efficiency in the transport sector through the following policies and investments: - Undertaking a traffic management study that aims at reducing traffic congestion in urban areas and along the Philip Goldson Highway into Belize City; - Improving public transport; - Upgrading maintenance of bus fleet; - Improving scheduling; - Upgrading the industrial fleet; - Promoting the use of bio-fuels. <u>Adaptation measures:</u> Vulnerability assessment of transport infrastructure, particularly in urban areas and areas critical to sustaining the country's productive sectors (tourism, agriculture and ports).
Benin	3.5% below 2030 BAU scenario	17.9% below 2030 BAU scenario	No Information	- Promote public transport and clean vehicles - Introduce duty relief of taxes on public transit vehicles - Improve traffic flow in urban crossings of large cities - Develop a river-lagoon transport system with navigable rivers - Modernize and extend rail infrastructure - Develop a collective urban transport system.
Bhutan	Remain carbon neutral with sequestration, estimated at 6.3 MtCO ₂ e		No Information	Promotion of low carbon transport system by: - Improving mass transit and demand side management of personal modes of transport; - Exploring alternative modes of transport to road transport such as rail, water and gravity ropeways; - Improving efficiency in freight transport; - Promoting non-motorized transport and non-fossil fuel powered transport such as electric and fuel cell vehicles; - Improving efficiency and emissions from existing vehicles through standards and capacity building; - Promoting use of appropriate intelligent transport systems.
Bolivia			No Information	No Information

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Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
<u>Bosnia and Herzegovina</u>	2% below 2030 BAU scenario	23% below 2030 BAU scenario	No Information	No Information
<u>Botswana</u>		15% below 2010 by 2030	No Information	No Information
<u>Brazil</u>	43% below 2005 levels in 2030		No Information	Further promote efficiency measures, and improve infrastructure for transport and public transport in urban areas.
<u>Burkina Faso</u>	6.6% below 2030 BAU scenario	11.6% below 2030 BAU scenario	42% below 2030 BAU scenario (conditional)	Faster improvement in vehicles (a 30% reduction in consumption by 2025 instead of 20% for 2030), and the use of alternative hydrocarbon biofuels. Bioethanol production units substitute 10% of consumption in 2030 and substitute 5% of diesel consumption in 2030.
<u>Burundi</u>	3% below 2030 BAU scenario	20% by 2030 relative to BAU scenario	No Information	Urban transport with low GHG emissions.
<u>Cabo Verde</u>	30% renewable energy penetration rate into the electric grid by 2025.	100% renewable energy penetration rate in 2020-2025.	No Information	Seek to develop a NAMA that increases energy efficiency of the transport sector, including domestic shipping and domestic air travel, and evaluates options for policies and actions available to reduce the impact of GHG emissions originating from this sector. The NAMA will initially be focused on the collection of relevant data for the sector, including, among others, fuel type and consumption per transport mode, technology performance, fuel substitution possibilities, estimation of costs, and an updated GHG emissions profile for light-duty vehicles as well as for freight and passenger transport services. This NAMA will also consider options for expanding hybrid and electric fleets in the country, in particular, the feasibility of making government vehicles electrically powered by 2030.
<u>Cambodia</u>		27% below 2030 BAU scenario	No information	-Promote mass public transport. -Improve operation and maintenance of vehicles through motor vehicle inspection and eco-driving, and the increased use of hybrid cars, electric vehicles and bicycles.

Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
<u>Cameroon</u>	Reduce GHG emissions by 32% compared to 2035 BAU		No information	- Limit mobility constraints and develop low-carbon transport offerings; - Promote an integrated approach to the sector and the development of low-carbon transport through a national transport infrastructure scheme; - Integrate climate in territorial planning documents to limit distances and propose efficient transport policies; - Support state and local authorities in the development of public transit and inter- and intra-city low carbon development plans (e.g. tramways in Yaounde and Douala); - Encourage the purchase of low-emission vehicles and scrapping of high-emission vehicles through standards, incentives or obligations.
<u>Canada</u>	30% below 2005 levels by 2030		No Information	Introduce more stringent greenhouse gas emission standards for passenger automobiles and light trucks, as well as regulations for heavy-duty vehicles.
<u>Central African Republic</u>	Reduce emissions by 5% compared to the 2030 BAU reference level		No Information	Black carbon reduction plan
<u>Chad</u>	18.2% below 2030 BAU levels	71% level 2030 BAU	No Information	No Information
<u>Chile</u>	CO2 emissions per unit of GDP reduced by 30% by 2030 over the 2007 level achieved	Reduction of CO2 emissions per unit of GDP between 35% to 45% over the level reached in 2007	No Information	Black carbon reduction plan
<u>China</u>	Peak CO2 emissions around 2030 and make best efforts to peak early and lower CO2 emissions per unit of GDP by 60% to 65% from 2005 levels		No Information	- Integrate low-carbon development in the entire process of urban planning; - Improve the quality of gasoline and new types of alternative fuels; - Promote the share of public transport in motorized travel in large- and medium-sized cities (targeting 30% mode share by 2020); - Promote the development of dedicated transport system for pedestrians and bicycles in cities; - Advocate green travel and accelerate development of smart transport and green freight transport.

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Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
Colombia	20% below BAU by 2030	30% below BAU by 2030	No Information	No Information
Comoros		84% reduction from 2030 BAU scenario	No information	No Information
Congo	48% below BAU scenario by 2025		No Information	Develop public transport services (particularly in Brazzaville and Pointe-Noire) to fight against congestion or introduce changes in legislation (e.g. prohibit import of vehicles older than 5 years). In a conditional low carbon scenario, it is proposed to control the rise in transport-related energy consumption to 70% of baseline scenario in 2025 with an option for renewable fuel to account for 21-43% of consumption.
Costa Rica	44% below BAU by 2030		No information	- Develop an integrated public transport system where routes are improved, train service strengthened, and availability of non-motorized transport enhanced; - Improve the freight sector through multi-modal options.
D.R. Congo	17% below BAU by 2030		10Mt CO ₂ eq reductions	Urban transport improvements
Djibouti	40% below BAU by 2030	60% below BAU by 2030	No information	- Construct a 752-km railway line between Djibouti City and Addis Ababa; - Set up a maintenance service for two-wheel vehicles and raise awareness about their use; - Eliminate the import of 10,000 old cars that produce excessive pollution.
Dominica	44.7% below 2014 levels by 2030		16.9% below 2014 levels by 2030	- Introduce environmental tax on imported vehicles, ranging from 1% of total value (including freight charges) on vehicles less than 5 yrs, to EC\$3,000 on vehicles older than 5 yrs; - Introduce a policy requiring that all government vehicles, at their time of replacement, will be replaced by hybrids vehicles; - Introduce market-based mechanisms to motivate the private sector to buy hybrid vehicles when replacing current vehicles.
Dominican Republic		25% below 2010 levels by 2030	No information	No information
Ecuador	Energy sector; 25% below 2025 BAU scenario	Energy sector; 45.8% below 2025 BAU	No Information	Develop electric rail (Trans-amazonian)

DRAFT

Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
<u>Equatorial Guinea</u>	20% below 2030 BAU		No Information	- Acquire high technology equipped aircraft; - Improve air traffic management, land and sea; - Continue modernization of airport infrastructure, road traffic and port infrastructure; - Promote urban and intercity public transport to reduce emissions due to the proliferation of individual transport.
<u>Eritrea</u>	39.2% below BAU scenario	80.6% below BAU scenario	No Information	No Information
<u>Ethiopia</u>		255 MtCO ₂ e or 64% compared to BAU emissions in 2030	10 MT by 2030	Clean rail transport, compact development.
<u>European Union</u>	40% reduction in 2030 compared to 1990		No Information	Rail transport to cover about 400km for mass transport of freight, with estimated cost of about USD 1billion; use of large buses for passenger transport over long distances.
<u>Gabon</u>	At least 50% reduction from BAU by 2025		20% reduction below BAU (1.6 MT reductions)	Infrastructure investments (with many planned routes); public transport services (e.g. congestion reduction in Libreville), and restrictions on importation of vehicles more than 3 years old.
<u>Gambia</u>	45.4% below 2030 BAU scenario		No Information	Reduce fuel consumption through efficiency standards. <u>Adaptation Proposal:</u> Improved resilience of road networks under changing climate.
<u>Ghana</u>	15% below 2030 BAU scenario	45% below 2030 BAU	No Information	Expansion of inter- and intra-city mass transport modes (rail and bus) in four cities.
<u>Grenada</u>	30% below 2010 levels by 2025		20% below 2010 levels by 2025	Undertake several policies/actions, including introduction of biofuel blends (specifically liquefied natural gas and diesel blend), implementation of gasoline and diesel taxes, and implementation of fuel efficiency standards for vehicles through incentives.

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Country	Economy-wide Target (unconditional)	Economy-wide Target (conditional)	Transport Sector Target	Summary of Proposed Transport Measures
Guatemala	11.2% below 2005 levels by 2030		No Information	Improvements in urban mobility based on efficient mass transport that promotes productivity in all sectors of the country and contributes to a significant reduction in emissions.
Guinea		Mitigate 76 cumulative Mt CO ₂ eq over next 15 years	No Information	Improve the quality of the transport fleet, the promotion of public transport, and the implementation of efficiency standards in building design.
Guinea Bissau		80% renewable energy in the national energy mix by 2030	No Information	No Information
Guyana	Mitigate 52 MtCO ₂ by 2025		No Information	No Information
Haiti	5% below 2030 BAU	26% below 2030 BAU	No Information	Develop and implement NAMAs in the transport sector.
Honduras		15% below 2030 BAU	No Information	No Information
Iceland	40% reduction of greenhouse gas emissions by 2030 compared to 1990 levels		No Information	No Information
India	Reduce emissions intensity of GDP by 33 to 35 percent by 2030 from 2005 levels		No Information	- Increase the share of railways in total land transport from 36% to 45%. - Construct two dedicated freight corridors: 1520 km Mumbai-Delhi (Western Dedicated Freight Corridor) and 1856 km Ludhiana-Dankuni (Eastern Dedicated Freight Corridor); - Promote growth of coastal shipping and inland water transport; - Construct 550 km plus 600 km of metro lines; - Approve construction of 39 urban transport and mass rapid transport projects;

Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
				- Construct solar powered toll plazas; - Develop Green Highways Policy; - Accelerate manufacturing and adoption of hybrid and electric vehicles; - Set passenger vehicle fuel-efficiency standards; - Develop national policy on biofuels.
Indonesia	26% below BAU scenario by 2020	Additional 15% reduction	No information	No information
Israel	26% below 2005 levels by 2030		No Information	- 20% shift from private to public transport; - Further development of public transport systems in major metropolitan areas, such as the construction of the Tel Aviv metropolitan light rail, the extension of the intercity rail system and the Jerusalem light rail.
Ivory Coast	28% reduction from 2030 BAU scenario		5.73% reduction from 2030 BAU	- Integrate climate in territorial planning documents in order to limit travel distances - Propose efficient transport policies; - Advance urban transport plan development (e.g. urban train in the district of Abidjan); - Facilitate purchase of low-emission vehicles and scrapping of high-emission vehicles through standards, incentives or obligations.
Japan	26% by fiscal year 2030 compared to 2013		27% below 2013 (or 163 MT by 2030)	- Improvement of fuel efficiency, promotion of next-generation automobiles, and other measures in transport sector (e.g. traffic flow improvement); - Promotion of public transport, modal shift to railway, and comprehensive measures for eco -friendly ship transport; - Reduction of land transport distance by selecting nearest port, and comprehensive low-carbonization at ports; - Optimization of truck transport, energy consumption efficiency improvement of railways, energy consumption efficiency improvement of aviation, and accelerated promotion of energy saving ships; - Making vehicle transport business more eco-friendly by eco-driving and promotion of collective shipments; - Promotion of Intelligent Transport Systems ITS (e.g. centralized control of traffic

Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
				signals); -Development of traffic safety facilities (e.g. improvement of traffic signals, and promotion of the use of LED traffic lights); - Promotion of automatic driving, eco -driving and car sharing; - Utilization of 'special zones system' for structural reform of global warming measures; - Promotion of inter-ministry collaborative measures following roadmap of global warming measures.
Jordan	1.5% below 2030 BAU emissions	14% below 2030 BAU emissions	No Information	- Launch the Ministry of Transport's long term national transport strategy in 2014 with sustainable transport as a key strategy; - Increase the total number of commuters using public transport as a percentage of the total number to 25% by 2025; - Reduce all emissions from the transport sector (i.e. CO ₂ , CO, PM _x); - Reduce percentage of fuel consumption achieved through the implementation of the transport strategy; - Reduce vehicle kilometers at national level and in densely populated areas by type of vehicle (i.e. car, HGV, LGV); - Implement a national BRT system; - Implement the railway system, which would be a cornerstone of the planned multimodal network and would play a major role in the transport of goods within the country and the surrounding region; - Adopt and implement policies related to fleet characteristics to enhance efficiency and reduce emissions;
Kazakhstan	15% reduction from 1990 levels by 2030	25% reduction from 1990 levels by 2030	No Information	Development of sustainable transport.
Kenya		30% by 2030 relative to the BAU scenario of 143 MtCO ₂ eq	No Information	Low carbon and efficient transport systems.
Kiribati	12.8% by 2030 compared to BAU projection	Reduce emissions more than 60% (61.8%) by 2030	No Information	Use of coconut oil as biodiesel for transport.

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Country	Economy-wide Target (unconditional)	Economy-wide Target (conditional)	Transport Sector Target	Summary of Proposed Transport Measures
Kyrgyzstan	13.75% below BAU in 2030	30.89% below BAU in 2030.	No Information	No Information
Lao PDR		Cumulative energy sector reduction to 2025 of 1468 MtCO ₂ eq	No Information	- Increase the share of biofuels to meet 10% of the demand for transport fuels by 2025. - In one NAMA feasibility study, road network development is identified as a first objective, which will reduce the number of kilometers traveled. The second objective is to increase the use of public transport compared to business as usual (BAU). In addition to a reduction in GHG emissions the activity will lead to a reduction in NO_x and SO_x emissions, which will have significant co-benefits such as improvement in air quality which in turn will have positive impacts on human health.
Lebanon	15% below 2030 BAU scenario	Up to 30% reduction compared to the BAU scenario in 2030	No Information	Restructuring of transport is planned through a number of large infrastructure initiatives aiming to revive the role of public transport and achieving a significant share of fuel-efficient vehicles.
Lesotho	10% below 2030 BAU scenario	Up to 35% by 2030	No Information	Promote transport mitigation options including vehicle efficiency, modal shift from private to public transport, and investments in fuel-efficient vehicles.
Liberia	Reduce GHGs by at least 10% by 2030 from BAU scenario		No Information	- Mainstream climate change into existing transport management plans to strengthen emission controls; - Strengthen institutional capacity for developing strategies for integrated transport services; - Develop technical and safety standards and the enforcement of policies including emission control; - Improve the quality and reliability of transport infrastructure and services; - Develop emission reduction and tracking systems of pollutants from vehicles; - Blend up to 5% of palm oil biodiesel with both gasoline and diesel by 2030.
Liechtenstein	40% compared to 1990 by 2030		No Information	Transport measure to be revised in 2016-2017

Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
<u>Macedonia</u>	Reduce CO2 emissions from fossil fuels combustion by 30% by 2030 compared to BAU scenario		No Information	Climate change and clean energy plan, transport sector strategy: - Extension of railway to Bulgaria; - Electrification of transport, increased use of railway; - Renewal of the vehicle fleet; - Increased use of bicycles and walking; - Introduction of a parking policy.
<u>Madagascar</u>	14% below 2030 BAU scenario, and an increase of GHG absorption of at least 32% compared to BAU scenario		No Information	<u>Adaptation measures:</u> Effective application of existing or newly established sectorial policies, including flood-resistant terrestrial transport infrastructure standards.
<u>Malawi</u>		0.7 to 0.8t CO2e per capita in 2030	No Information	- Unconditionally produce 2 million liters of biodiesel/year, conditionally increase this to 20 million liters/year; - Unconditionally produce 18 million liters of ethanol/year, conditionally increase this to 40 million liters/year; - Unconditionally increase passengers using mass transport by 1%, conditionally increase this to 30%.
<u>Maldives</u>	10% below BAU by 2030	Up to 24% below BAU by 2030	No Information	No information on mitigation <u>measures</u> . <u>Adaptation measures:</u> Coastal protection measures to protect the shoreline of Hulhule, the island that contains Ibrahim Nasir International Airport, as well as for other air and seaports.
<u>Mali</u>		31.6% reduction from 2030 BAU scenario	No Information	No Information
<u>Marshall Islands</u>	32% below 2010 levels by 2025		Reduce transport emissions by 16% in 2025 and	Replace more than one-third of fossil fuels (with renewables) for electricity and transport by 2030.

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Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
			27% in 2030	
<u>Mauritania</u>	22.3% below 2030 BAU levels		No Information	Limit import of cars aged 8 years or more; create tax exemptions for bus factories.
<u>Mauritius</u>	30% below 2030 BAU scenario		No Information	Acquisition of hybrid and electric means of mass transport. Black carbon reduction plan
<u>Mexico</u>	22% reduction of GHG for 2030 compared with BAU scenario	36% reduction of GHG for 2030 compared with BAU scenario	No Information	No Information
<u>Monaco</u>	50% by 2030 compared to 1990 levels		No Information	Continue mobility policy of development of clean public transport, development of soft modes (pedestrian walkways, bicycle trips) and development of electric mobility.
<u>Mongolia</u>	14% below 2030 BAU levels		No Information	- Improve national paved road network (upgrade/pave 8000 km by 2016, 11000 km by 2021); - Improve Ulaanbaatar city road network to decrease all traffic by 30-40% by 2023; - Increase the share of private hybrid road vehicles from approximately 6.5% in 2014 to approximately 13% by 2030; - Shift from liquid fuel to LPG for vehicles in Ulaanbaatar and provincial centers by improving taxation and environmental fee systems; - Improve enforcement mechanism of standards for road vehicles and non-road based transport.
<u>Montenegro</u>	30 % reduction by 2030 compared to 1990		No Information	No Information

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Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
<u>Morocco</u>	13% reduction from 2030 BAU scenario	32% below BAU emission levels by 2030	No Information	Reduce fossil fuel subsidies and promote use of natural gas.
<u>Mozambique</u>		Total reduction of about 76,5 MtCO ₂ eq in the period from 2020 to 2030	No Information	Project of urban mobility in the municipality of Maputo
<u>Myanmar</u>		Remain a negative net sink country	No Information	National Transport Master Plan and National Implementation Plan on environmental improvement in the transport sector are being developed. Cities (e.g. Yangon) are studying options for sustainable transport development for example, and CSOs are engaged in proposing solutions to challenges for implementation.
<u>Namibia</u>	9% reduction from 2030 BAU	89% reduction from 2030 BAU	No Information	- Commission of a mass transport system in City of Windhoek to reduce number of taxis and private cars by about 40%; - Implement a car pooling system to reduce fossil fuel consumption; - Improve freight transport to reduce the number of light load vehicles by about 20%.
<u>New Zealand</u>	30% below 2005 levels by 2030		No Information	Increase renewable electricity usage in transport and increase uptake of low emission technologies.
<u>Niger</u>	3.5% below 2030 BAU scenario	34.6% below 2030 BAU	No Information	No Information
<u>Norway</u>	40% reduction in 2030 compared to 1990 levels.		No Information	Reduce emissions in the transport sector and introduce environmentally friendly shipping.
<u>Papua New Guinea</u>		Carbon-free electricity generation sector by 2030	No Information	- Improve public transport by introducing energy efficient buses in the main urban centers; - Introduce future infrastructure for more sophisticated modes of public transport, such as trains and trams.

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Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
<u>Paraguay</u>	10% by 2030 relative to BAU scenario	A further 10% by 2030 relative to BAU scenario	No Information	Promote efficient multi-modal transport.
<u>Peru</u>	20% below 2030 BAU	30% by 2030 relative to BAU scenario	No Information	No Information
<u>Philippines</u>		Reduction of about 70% by 2030 relative to BAU	No Information	No Information
<u>Republic of Korea</u>	37% below 2030 BAU		No Information	- Expand infrastructure for environmentally friendly public transport, while introducing low-carbon standards for fuel efficiency and emissions produced from automobiles; - 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.
<u>Republic of Moldova</u>	64-67% reduction by 2030 compared to 1990 levels	Up to 78% reduction below 1990 levels	15% GHG emissions reduction compared to BAU scenario by 2020	Adopt new technical and normative standards in transport and building sectors (adoption of Eurocodes) <u>Adaptation measures:</u> Analyze adaptation options, including altering assumptions about infrastructure design and operations, and incorporating uncertainty into long-range decision making.
<u>Republic of Serbia</u>	9.8% below 1990 levels by 2030		No Information	No Information
<u>Russia</u>		Limit anthropogenic greenhouse gases to 70-75% of 1990 levels by 2030	No Information	No Information

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Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
Rwanda		Estimated impact of policies is underway and will be informed by the Third National Communication Report to be completed by 2017.	No Information	- Develop efficient resilient transport systems; - Improve vehicle efficiency through vehicle and fuel quality regulations and taxation policies; - Promote new technologies to reduce transport emissions; - Establish an integrated multi-modal urban transport system.
Samoa	100% renewable electricity generation target in 2017		No Information	Implement regulations to restrict vehicle emissions.
San Marino	20% below 2005 levels by 2030		No Information	No Information
Sao Tome and Principe	24% emission reduction by 2030 relative to 2005		No Information	No Information
Senegal	5% below 2030 BAU scenario	21% below 2030 BAU scenario	No Information	Implement Bus Rapid Transit (BRT) pilot in Dakar/Guédiawaye
Seychelles	29% below 2030 BAU scenario		Reduction in emissions of 50.13 ktCO ₂ in 2030	Maintain a high penetration of public transport, target fuel efficiency and biofuels in import regulation, and move towards electric vehicles and two-wheelers, with potential to reduce oil imports for transport purposes by 15% to 30% (or more) by 2030 compared to BAU.
Sierra Leone		Maintain emission levels close to the world average of 7.58 MtCO ₂ e by	No Information	- Develop and enforce regulations on regular maintenance of vehicles and vehicle emission testing; - Formulate transport plans; - Improve and promote use of public transport (e.g. road, rail and water) for

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Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
		2035		passengers and cargo to reduce traffic congestion and GHG emissions; - Diversify economic growth through strengthened transport sub-sector (particularly infrastructure) to reduce regional and global emissions and build a stable economy.
<u>Singapore</u>	36% below 2005 levels by 2030, and stabilize emissions with the aim of peaking around 2030		No Information	No Information
<u>Solomon Islands</u>	30% below 2015 level by 2030	45% reduction in GHG emissions by 2030, compared to BAU	No Information	No Information
<u>South Africa</u>	Limit emissions to maximum 614 MTCO ₂ eq by 2030		No Information	Integrate electric vehicles and target 20% hybrid-electric vehicles by 2030
<u>Swaziland</u>	Develop a mitigation goal and associated action plan by 2020		No Information	Target 10% ethanol blend in petrol by 2030
<u>Switzerland</u>	50% by 2030 compared to 1990 levels		No Information	No Information
<u>Tajikistan</u>	Not to exceed 80-90% of 1990 levels by 2030	65-75% of 1990 level sby 2030	No Information	Modernize industry and transport

Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
<u>Tanzania</u>	10% by 2030 relative to the BAU scenario	20% by 2030 relative to the BAU scenario	No Information	Promote low emission transport systems through deployment of mass rapid transport systems and investments in air, rail, marine and road infrastructures.
<u>Thailand</u>	20% below 2030 BAU scenario	Up to 25% below 2030 BAU scenario	No Information	Environmentally Sustainable Transport System Plan proposes ambitious actions to promote road-to-rail modal shift for both freight and passenger transport, including extensions of mass rapid transit lines, construction of double-track railways and improvement of bus transit in the Bangkok Metro area. A vehicle tax scheme based on CO2 emissions will become effective beginning 2016.
<u>Togo</u>	11.4% below 2030 BAU	31.14% below 2030 BAU	No Information	Planned actions are designed to reduce fossil fuel consumption 20 through the improvement of the road network, the promotion of public transport, limiting age of imported vehicles to 5-7 years, and promoting active transport (bicycles, walking, bike path development).
<u>Trinidad and Tobago</u>		15% below 2030 BAU emission levels.	30% reduction in by 2030 in public transport sector compared to BAU	No Information
<u>Tunisia</u>	13% reduction in carbon intensity relative to 2010	41% compared to 2010	No Information	Around 20 energy efficiency actions have been included, covering the entire industrial, building, transport and agricultural sectors.
<u>Turkey</u>	21% reduction in GHG emissions from BAU by 2030		No Information	- Ensure balanced utilization of transport modes in freight and passenger transport by reducing the share of road transport and increasing the share of maritime and rail transport; - Implement sustainable transport approaches in urban areas; - Promote alternative fuels and clean vehicles; - Reduce fuel consumption and emissions of road transport with National Intelligent Transport Systems Strategy Document (2014-2023) and Action Plan (2014-2016); - Complete high speed railway projects; - Expand urban railway systems;

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Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
				- Achieve fuel savings through tunnel projects; - Scrapping old vehicles; - Implement green port and green airport projects to ensure energy efficiency; - Implement special consumption tax exemptions for maritime transport.
<u>Turkmenistan</u>		Stabilize or begin to reduce GHG emissions by 2030	No Information	No Information
<u>Ukraine</u>	Not to exceed 60% of 1990 emissions		No Information	No Information
<u>United States</u>	Reduce emissions by 26-28% below 2005 levels in 2025		No Information	- Introduce fuel economy standards for light-duty vehicles for model years 2012-2025 and for heavy-duty vehicles for model years 2014-2018.
<u>Uruguay</u>	Reduce CO2 emissions by 25%, CH4 by 44% and N2O by 40% per unit GDP by 2030	Reduce CO2 emissions by 40%, CH4 by 68% and N2O by 41% per unit GDP by 2030	No Information	- Implement BRT corridors for metropolitan public transport; - Introduce electric and hybrid private and public vehicles; - Increase the percentage of biofuels in gasoline and diesel oil blends; - Introduce public and private vehicles that support a higher percentage of biofuel blends; - Enhance vehicle fleet through higher power efficiency standards and lower emissions; - Improve cargo transport, through the incorporation of new multimodal systems, and increased use of railroad and inland waterway transport.
<u>Vanuatu</u>		30% reduction in energy sector below 2030 BAU scenario	No Information	No Information
<u>Vietnam</u>	8% below BAU scenario	25% below 2030 BAU scenario	No Information	- Develop public passenger transport, especially rapid transit in large urban centers; - Restructure freight to reduce share of road transport and increase share of transport via rail and inland waterways; - Encourage buses and taxis to use compressed natural gas and liquefied petroleum gas; - Implement management solutions for fuel quality, emissions standards, and vehicle maintenance.
<u>Zambia</u>	25% below 2030	47% below 2030	No	Promote fuel switching (e.g. diesel to biodiesel).

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Country	<u>Economy-wide Target</u> (unconditional)	<u>Economy-wide Target</u> (conditional)	<u>Transport Sector Target</u>	<u>Summary of Proposed Transport Measures</u>
	BAU scenario	BAU scenario	Information	
<u>Zimbabwe</u>		47% below 2030 BAU scenario	0.341 MtCO ₂ eq reduction in 2030	Refurbish and electrify the rail system.