National Low Carbon Transport Roadmaps & Strategies
Regional Cooperation Mechanism on Low Carbon Transport (17-18 July 2024)

Ministry of Infrastructure and Transport
Royal Government of Bhutan
Bhutan: Country Profile & First NDC

Bhutan
• Landlocked country located in the southern slopes of the eastern Himalayas
• Population around 727,145
• Characterized by a fragile and mountainous ecosystem with dense forest cover spreading over more than 70% of the country
• Thimphu is the capital and the largest and most populated city of Bhutan

Bhutan’s first NDC
• Bhutan submitted its Intended Nationally Determined Contribution (INDC) to the Paris Agreement on 30 September 2015
• On ratification of the Paris Agreement on 19 September 2017, the INDC became Bhutan’s first NDC
• The NDC reaffirmed Bhutan’s pledge to remain carbon neutral first made in 2009 and laid out the priorities for low GHG emissions development across nine areas including transport sector within the energy group.
Trends in Bhutan’s Transport Sector

- Road transport is the primary means of passenger and goods transportation.
- Total registered vehicles 112,058. Considering the current population, this number translates to 154 motor vehicles per 1,000 people which is considered very high.
- The vehicles are not evenly distributed across the regions, but are concentrated mainly in Thimphu and Phuentsholing regions.
- One primary concerns for Bhutan is the dominance of private commuter vehicles in its transportation system (light vehicles accounts for 81% while heavy and medium vehicles together constituted less than 1%) highlighting the need and opportunity to strengthen public transportation system in the country.
- Fuel type – almost 99.9% of the motor vehicles in Bhutan use diesel or petrol as the primary source of transport energy.
- Of the total, approximately 8% taxis and 40% light vehicles are powered by diesel engines
- Number of EVs growing over the years but only marginally. Share of EV is 0.12% of the total vehicles.
- The total GHG emissions in Bhutan were 3,814,000 metric tonnes CO2e in 2015 against the sequestration capacity of 9,386,590 metric tonnes CO2e or Carbon negative by 5,572,500 metric tonnes CO2e.
Challenges in the Surface Transport Sector

- Light vehicles account for more than 81% while heavy and medium public transport buses together constitutes less than 1%

- This disparity has not only resulted in traffic congestion but it is also a major factor to the deteriorating air quality increasing GHG emissions and increasing road crash fatalities.

- Number of personal vehicles in Bhutan is expected to increase to levels experienced in developed countries

- Vehicle growth is not matched by the supply of road network and parking space in urban areas, the need to invest in efficient and adequate public transportation solutions together with other policy measures have become urgent.

- The migration of people from rural to urban areas in Bhutan is putting tremendous pressure on the existing urban infrastructure in general and transportation system. This calls for improvement in public transport systems in urban areas along with promotion of Non-Motorized Transport (NMT) and intelligent land use planning.

- The increase in inflow of tourist has provided a tremendous boost to the overall economy and therefore calls for efficient eco-friendly as well as attractive public transport options including buses and taxis.

- Freight transportation in the country is almost dependent on road transport with a small quantity of cargo carried by air. As a result, emissions from frequent movement of heavy and medium commercial trucks represents a majority share of air pollutants and GHG emissions.

- One of the prime cause of increasing import of fossil fuels in Bhutan is the rising number of vehicles. The primary end use of fossil fuel is the transport sector. In business-as-usual scenario, it is expected that this trend will continue and will pose a significant threat to the environment and the country’s economy.
Second Nationally Determined Contribution 2021

Transport emissions are projected to increase by a factor of three by 2050 as compared to 2020 levels under business-as-usual scenario. The LEDS for surface transport was developed to provide strategic intervention options for transport and mobility and are categorized as follows:

1. Mass transit through improvements in bus systems and the introduction of open -Bus Rapid Transit (BRT) network (electric and diesel) and Light Rail Transit (LRT)
2. Promotion of electric passenger vehicles (taxi, two wheelers, light vehicles, buses)
3. Low emission freight transport system for heavy and commercial trucks and freight trains
4. Non-motorized Transport system through public bicycle systems and improved sidewalks, cross walks
5. Improve fuel-efficiency in internal combustion engines through stringent vehicle and emission standards
6. Private vehicle demand management through shared mobility, traffic system management car pooling, ride sharing and rental services, import restriction on internal combustion engine cars from 2030 and introducing annual import quota system.
Following Bhutan’s pledge at the COP15 in 2009 to remain carbon neutral for all times to come, LEDS 2021 aims to achieve a low carbon development pathway in the surface transport sector.

It is a 30 year strategy 2021-2050 with prioritized climate actions for reducing GHG emissions.

Transport sector in Bhutan has been identified as the primary source of GHG emission in the energy group and responsible for approximately 424,830 metric tonnes CO2e emission or 11.14% of the total GHG emissions (3,814,000 metric tonnes) in 2015.

Within the energy group, transport activities was responsible for more than 60% emission.

This is likely to increase to 1.25 million metric tonnes CO2e by 2050 under a business as usual scenario, with significant rise in GHG emission expected from light vehicles (3.8 times) followed by medium trucks (3.6 times) and heavy trucks (3 times). Hence the need to draw suitable strategy to control emission has been recognized globally to address global rise in temperature.

It is estimated that the GHG emission mitigation potential of implementing a particular intervention would vary from 73,397 metric tonnes CO2e to 5,684,962 metric tonnes CO2e over a period of 30 years until 2050.

30 year action plan is divided into short, medium and long term interventions, prioritized on the basis of, a. Potential for GHG reduction b. Fuel savings c. Capital and infrastructure costs and d. Abatement cost per metric tonnes CO2e
## Mitigation Potential of LEDS Surface Transport

<table>
<thead>
<tr>
<th>Intervention (in priority order)</th>
<th>Description</th>
<th>Cumulative emissions reductions till 2025 (tCOSe)</th>
<th>Cumulative emissions reductions till 2030 (tCO2e)</th>
<th>Cumulative emission reductions till 2050 (tCO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emissions Standards</td>
<td>Reducing vehicle emissions by adopting stricter emissions standards &amp; synchronizing it with fuel economy improvement measures</td>
<td>55,364</td>
<td>270,772</td>
<td>3,187,366</td>
</tr>
<tr>
<td>Shared Mobility</td>
<td>Promoting shared mobility to improve average vehicle occupancy and strengthening public transport</td>
<td>45,153</td>
<td>301,351</td>
<td>2,875,672</td>
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<tr>
<td>Electric Passenger Vehicles</td>
<td>Promoting less polluting transport alternatives for all passenger vehicles which include 2W, 4W, Bus, etc</td>
<td>30,658</td>
<td>203,343</td>
<td>5,684,962</td>
</tr>
<tr>
<td>Improving walkways/sidewalks</td>
<td>Promoting non-motorized transport such as walking, by constructing more walkways and sidewalks</td>
<td>1,269</td>
<td>5,113</td>
<td>73,397</td>
</tr>
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<tr>
<td>Annual vehicle capping system</td>
<td>Gradual phase out of ICE vehicles and Annual capping system for vehicle import/sales</td>
<td>-</td>
<td>-</td>
<td>2,940,923</td>
</tr>
<tr>
<td>BRT Electric</td>
<td>Deploying electric buses in a dedicated bus priority lane</td>
<td>3,158</td>
<td>11,985</td>
<td>134,758</td>
</tr>
<tr>
<td>LRT and Passenger Train</td>
<td>Developing rail network and deploying passenger train connecting cities/towns</td>
<td>-</td>
<td>20,306</td>
<td>112,444</td>
</tr>
<tr>
<td>Bicycling (PBS)</td>
<td>Promoting non-motorized transport such as bicycling through public/community based cycle system</td>
<td>1,389</td>
<td>5,580</td>
<td>79,480</td>
</tr>
<tr>
<td>Low emission freight truck</td>
<td>Promoting less polluting transport alternatives for all freight transport such as electric trucks</td>
<td>-</td>
<td>3,675</td>
<td>447,342</td>
</tr>
<tr>
<td>Freight Train</td>
<td>Developing rail network and deploying freight train connecting cities/towns</td>
<td>-</td>
<td>10,370</td>
<td>246,987</td>
</tr>
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</table>
Urban and Rural Settlement in Bhutan: A Low Emission Development Strategy 2017

Issue
Increase in ownership of vehicles in Bhutan is extremely high. A 6% increase per year until 2030 from 2017 is therefore applied for light vehicles which leads to about 125,000 such vehicles in 2030.

Recommendation
• Promote and replace ICE vehicles with EV
• Develop the required infrastructure to support EV
• Replace taxis with EV
• Introduce energy efficiency/fuel standards for conventional diesel and petrol fueled cars
• Public mass transit
Low Emissions Transport Master Plan: Strategies for Thimphu 2023

Vision
1. Connect people and places
2. Reduce carbon emissions to help mitigate against climate change
3. Enhance the city’s economy and attractiveness to benefit residents, visitors and businesses.

Overarching principles
1. Prioritization of people over vehicles
2. Promotion of sustainable transport modes
3. Integrated land use and transport planning,
4. Transition of vehicle fleets to clean fuels
Low Emissions Transport Master Plan: Strategies for Thimphu 2023

Key Strategies
1. Enhancing walkability
2. Introducing cycling
3. Improving public transport
4. Addressing first and last mile connectivity
5. Moving freight efficiently
6. Reducing the need to own and drive a car
7. Transitioning the vehicle fleet to clean energy
8. Reducing peak hour demand
9. Targeting traffic pinch points
10. Encouraging trial of sustainable transport modes
11. Moving freight efficiently.
Bhutan Green Transport Project - Thimphu

Objective

1. To provide a high-quality bus priority service on a key corridor in Thimphu City
2. To pedestrianize part of a main boulevard in the center of the city
3. To improve access to opportunities for the residents of Thimphu city and provide reliable, safe and green urban mobility options to them, along the North-south axis of Thimphu City as well as the City Center.

Key Strategies

1. Priority bus service infrastructure, fleet and systems.
2. Pedestrianization of Norzin Lam - This component will finance the development of the 18 km priority bus service corridor along Thimphu’s north-south axis (Babes to Dechencholing)
3. Capacity Development - This component will finance goods purchases, consultancies and training for institutional strengthening for the operation of the priority bus services.
Other Policies, Strategies related to Transport Sector

**EV Roadmap – work in progress**
- Objective is to recommend mid-term and long-term targets for National EV and EVSE (EV Supply Equipment) Program. The roadmap will also aim to promote EV penetration in conjunction with existing relevant national priorities and policies.

**Third National Communication to the UNFCCC 2020**
- Third National Communication from Bhutan to the UNFCCC elaborates the actions which are required to be taken in addition to the mitigating GHG emissions and addressing the impacts of climate change in Bhutan.
- Policy objective of mitigation assessment is carbon neutrality for the duration of the evaluation period (2010-2024).

**National Environment strategy 2020**
- The vision of this National Environment Strategy is “A Healthy and sustainable environment for present and future generations in pursuit of Gross National Happiness”

**Climate Change Policy of the Kingdom of Bhutan 2020**
- Climate change Policy reiterates the commitment made by the RGoB at COP15 to remain carbon neutral. It aims to provide guidance to achieve a climate resilient and carbon neutral economy that contributes to GNH.
- CCP focuses on four broad areas of actions requiring emission mitigation, adaptation to the adverse impact of climate change, ensuring adequate support measures and effective engagement among stakeholders.

**National Surface Transport Policy (Draft)**
- It describes national and regional development priorities, objectives and circumstances to address climate change issues.
Other Policies, Strategies related to Transport Sector

National Energy Efficiency and conservation Policy 2019
- The policy addresses the energy demand side management focusing on energy intensive sectors. The policy aims to create an enabling environment for energy efficiency and conservation measures in buildings, appliances, industries and transport sectors.
- Recognizing that the transport sector contributed to 60% of GHG emissions within the energy group in 2015, this policy recommended systematic promotion of sustainable transportation system through various actions.

Economic Development Policy 2016
- The policy outlines the economic roadmap of the country focusing on key areas such as energy, industry, mining, agriculture, construction, education, health trade, financial, ICT, services, transport services, amongst others.

National Environment Strategy for sustainable development 2015
- Main purpose of this strategy document is to guide the planning, mainstreaming and implementation of environment management needs within the overall development plans and programs at the central, sectoral and local levels over a period of 10 years ending 2025.

- The strategy was formulated to enable Bhutan in fulfilling its commitment of remains carbon neutral.

Bhutan Transport 2040: Integrated Strategic Visions 2011
- Bhutan Transport 2040 establishes building blocks to enable Bhutan to achieve vision for the transport sector by 2040. The vision document covers the entire transport infrastructure as well as addresses institutional, policy, legal and management functions associated with the delivery of transport services.

Bhutan’s second National Communication to UNFCCC 2011
- It outlines national development priorities as the basis of addressing climate change and its adverse impacts.
Thank You