



NEPAL

E-mobility Country Profile

Background

Nepal is a landlocked country nestled in South Asia, bordered by China to the north and India to the south, east, and west. It is renowned for housing eight of the world's ten tallest mountains, including Mount Everest. Covering an area slightly larger than 147,000 square kilometres, Nepal ranks as the 93rd country globally in terms of size. With a population of approximately 30 million people, it stands as the 48th most populous nation worldwide and is a significant cultural and natural hub in South Asia, known for its rich history, diverse cultures, and vibrant traditions.

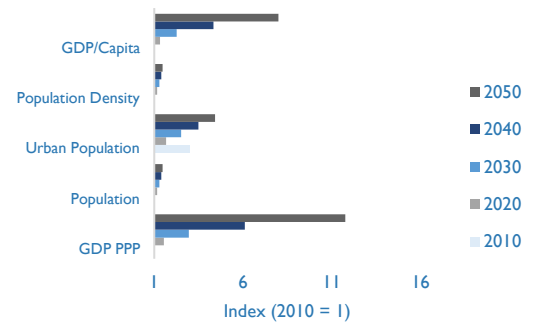
Nepal's GDP per capita is projected to grow at long-term annual average rate of 6.2% (up to 2050).¹ Nepal has a relatively low urbanisation rate, estimated to be at around 22% in 2023, compared to the sub-regional average in South Asia at 34%. Passenger transport activity is estimated to grow at 1.5% per annum up to 2050, while freight transport activity is estimated to grow faster at 4.8% per annum over the same period.² Due to the lack of viable fossil fuel reserves, Nepal imports all its oil needs, and spends at least 1.5 billion USD per year on refined oil imports.³

The vehicle registration in Nepal has reached 5.2 million in 2022.⁴ Consequently, we can expect continued growth in the vehicle fleet. While Nepal's motorization index is still relatively low at 125 vehicles/capita, Nepal's motorization index has grown 25 times since 1990s, and has exhibited the fastest growth in South Asia, and second only to China in the whole Asian region.⁵

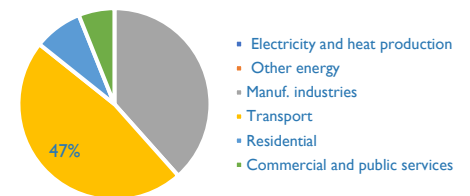
The transportation sector is one of the major contributors to greenhouse gas (GHG) emissions in Nepal and is estimated to contribute about 44% of the fuel combustion GHGs in the country (total of 12 million tons in 2020). Ninety-nine percent (99%) of the transport CO2 emissions is from the road sector.⁶

In terms of ambient air pollution, the road transport sector is estimated to contribute 5.3 % of the total burden of disease related to Particulate Matter 2.5 (PM2.5) — in the country. Road transport air pollution is also deemed to have significant contributions to the burden of disease related to ischemic heart disease (25%), and more significantly to chronic obstructive pulmonary disease (41%) in the country.⁷ Kathmandu, which hosts around 845 thousand people, had an average of 37 µg/m³ of PM2.5 in 2020, which is at least 7 times higher than the WHO PM2.5 guideline value of 5 µg/m³.^{8,9}

Socio-economic & Transport Indicators

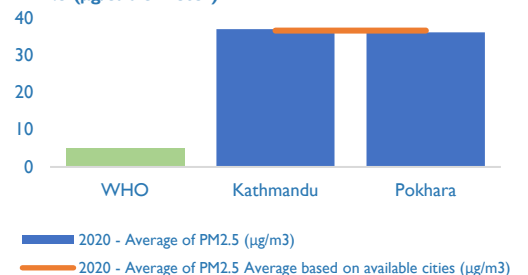


2020 Fuel Combustion CO2: % By Sector



Total: 12 million tons

PM2.5 (µg/cubic meter)



E-mobility at a Glance

The Electric Vehicle Association of Nepal (EVAN) estimates that in 2018, the total number of EVs had reached 45,000.¹⁰ Around the same time, there had been estimates that at least 10% of all new sales of cars were electric.¹¹ The Ministry of Finance reported that in 2022, there were 55,585 electric rickshaws that were registered in Nepal.¹²

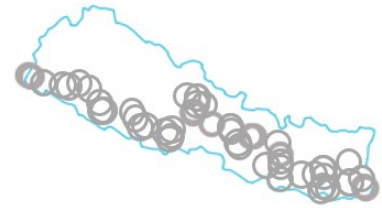
Electrification of public transport came to Nepal in the 1970s, with the introduction of the electric trolley bus in Kathmandu and went on up to 2009. Nepal was also a trailblazer in terms of electrifying three-wheelers, as battery-powered safa tempos were introduced in the early 1990s. Diesel-fed tempos in Kathmandu Valley, were banned in the 1990s due to air pollution.¹³ The popularity of the safa tempos eventually led to the opening of seven manufacturing plants, and almost 40 charging stations. At least 750 jobs were being supported by the industry in the early 2000s.¹⁴ In 2023, it is estimated that at least 700 electric safa tempos run in the Kathmandu Valley.¹⁵ These safa tempos faced challenges related to batteries, and the costs that came along with the battery requirements. The banning of the diesel tempos in Kathmandu also had an unintentional effect. Together with the ban, the government provided compensation to the owners by allowing them to import petrol minibuses at lowered tariffs (160% to 1%), which had led many to replace their diesel tempos with fossil-based minibuses.¹⁶ The electric tempo industry essentially stagnated towards the end of 2000 but is now being revived through various initiatives. The EU-supported Solutionsplus project, for example, is working with local entrepreneurs to develop new form factors for safa tempos, as well as testing e-bus conversion.¹⁷ A project supported by the Mitigation Action Facility (Ministry of Physical Infrastructure and Transport; Ministry of Forests and Environment; and Ministry of Finance, implemented by GIZ) will deploy more than 3,000 electric minibuses, as well as charging stations. It envisions that by 2030, 85% of all new minibuses purchased in Nepal will be electric.¹⁸

There are also initiatives to introduce e-buses in Nepal. Sajha Yatayat, one of the largest public transport service providers in the country had purchased 37 electric buses from China in 2021 - with a grant from the government- but have had issues in deployment due to lack of charging stations and infrastructure challenges in the Kathmandu Valley.¹⁹ Sundar Yatayat, another operator, is also operating at least 4 electric buses in the valley.²⁰

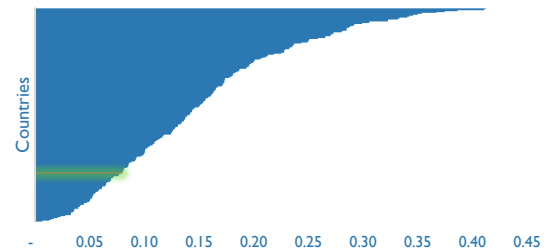
The electric vehicle (EV) charging infrastructure in Nepal is undergoing significant developments, with efforts to expand and modernize the network to support the growing interest in electric vehicles. As of February 2024, there are at least 350 charging stations in Nepal.²¹ These stations host mostly CCS2 chargers, while some of those stations by the National Electric Authority also feature chargers for GB/T plugs. The private sector is playing a significant role in putting up these charging stations (Tata, Sundar Yatayat, Dee-Group, MG Motors, Hyundai, BYD).

The average price of electricity in Nepal (2021) was estimated to be 0.08 USD/kWh.²² This ranks as the 53rd cheapest average rate globally. Ninety percent (98%) of the population has access to electricity in Nepal.²³ In terms of the emissions impact of the electricity grid, the national average is estimated at 25 kgCO₂ is emitted per MWh, which is the fourth cleanest grid in the world in terms of CO₂ emissions.²⁴ Nepal's electricity is mainly from locally-produced hydropower. The remaining requirements were fulfilled by importing electricity from India, mainly to balance the shortage of power in winter.

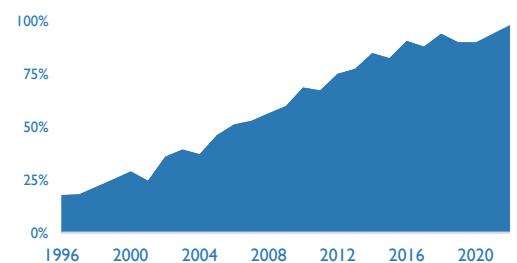
Charging Stations Approximate Locations



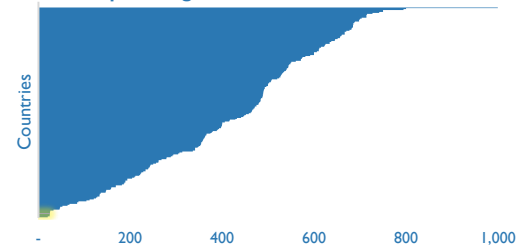
Nepal: 0.08 USD/kWh



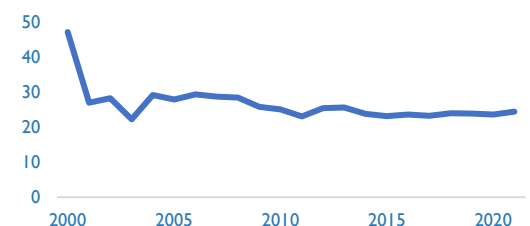
% Population with Access to Electricity



Nepal: 25 kgCO₂/MWh



Nepal Historical Grid kgCO₂/MWh



Policy Measures: Highlights

In May 2019, the Prime Minister's Committee on Climate Change apE-E-E-E-mobility is being supported by various policies in Nepal such as its second (enhanced) NDC (2020) which mentions the following relevant targets and measures:²⁵

- 25% of all private passenger vehicle sales (including 2-wheelers) and 20% of all four-wheelers public passenger vehicle sales will be electric by 2025
- 90% of private passenger vehicle sales and 60% of four-wheeler public passenger vehicles sales will be electric by 2030
- Develop 200 km of electric rail network by 2030
- Expand clean energy generation from 1,400 MW to 15,000 MW by 2030.

Its first Nationally Determined Contribution (NDC) issued in 2016 included electric mobility-related targets such as the following:²⁶

- Increase the share of EVs to 20% against 2010 levels by 2020
- Reduce fuel dependency by 50% by 2050 but promoting mass transport, coupled with energy efficient and electric vehicles
- Develop electric rail network by 2040.

The National Action Plan for Electric Mobility (2018) aims to halve Nepal's fossil fuel consumption by 2050. The import tariffs for EVs are significantly lower for EVs than their fossil fuel counterparts. It proposes three priority actions:²⁷

- Establishment of a dedicated unit / centre/ taskforce on electric mobility
- Establishment of a national program on electric mobility that encompasses various pillars such as: legislative support for EV adoption, raising public awareness; supporting consumer acquisition, among others
- Establishment of a national financing vehicle to co-fund e-mobility projects together with the private sector.

The 15th Five Year Periodic Plan (2019/20-2023/24) puts a target of 35% share of EVs in the fleet by 2023/24, and states that electric vehicles will be promoted, and appropriate tariffs will be fixed. IT also mentions that charging stations will be gradually set up as needed with the participation from the private sector.²⁸

The Budget Speech 2022/23 states that an arrangement will be made to convert private and public petroleum-based vehicles to EVs. An arrangement for public procurement of EVs will also be developed.

- If a new industry of four-wheel electrical passenger vehicles is established for production or assembly, an arrangement is made to exempt 40 percent income tax for 5 years from the starting date of the transaction of the industry.
- 1% levied on customs duty on the raw materials or spare parts used by the industries manufacturing electric rickshaws and electric motorcycles or scooters
- Nepal Electricity Authority will operate charging stations at 50. The private sector will be encouraged to set up charging stations at petrol pumps.
- The use of electrical equipment and vehicles will be promoted emphasizing renewable energy including solar, wind, and biogas.

After the announcement of these incentives, Moterx Pvt. Ltd. (Korean company) announced that it will establish an assembly plant in Butwal. Based on the Nepal Budget for 2022-2023, there had been an increase in excise duty for EVs that are 100 kW and above (30%, 45%, 60% for 100-200 kW, 201-300 kW, and > 300 kW, respectively), while customs duties for EVs >100 kW have been increased from 15% to 20%.²⁹

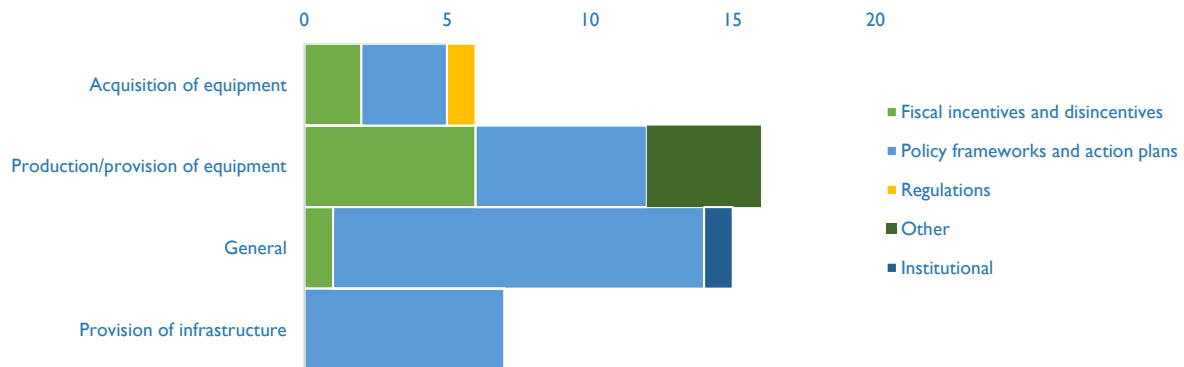
The National Transport Policy in 2001 has an objective of making the transport sector environment friendly and mentions the expansion of solar powered and electricity driven transport. It proposes the provision of economic instruments such as customs and tax incentives towards promoting private sector participation in proliferating non-polluting vehicles.³⁰

The Environmentally Friendly Transport Policy (2014) sets specific targets towards adopting EVs. It mentions a target of increasing the share of environmentally friendly vehicles to at least 20% by 2020. Similarly, the National Climate Policy, as well as the National Environment Policy (both issued in 2019) promotes electric vehicles.^{31,32} A draft National Sustainable Transport Strategy (2015-2040) also included the promotion of electric vehicles as a key objective.

It is also worth to note that action at the sub-national level is being promoted. For example, the Bagmati Province First Periodic Plan supports the promotion of EVs and establishment of charging stations by municipalities. It also targets replacing all petroleum-powered vehicles with EVs units' urban centres, mainly Kathmandu Valley, Chitwan, Hetauda and Dhulikhel, Banepa, and Panauti by 2028.³³

Snapshot of E-mobility Policy Measures

Distribution of Policy Measures



Pillar	Stage	Category	Type of Policy Measure
EVs and EV components	Acquisition of equipment	Fiscal incentives and disincentives	Custom tariff waiver/ reduction for EV and components
			Excise tax waiver for EV and components
		Policy frameworks and action plans	Public fleet electrification target
			Public procurement directive/program
	Regulations	Regulating age of imported Evs	
	Production/provision of equipment	Fiscal incentives and disincentives	Fiscal incentives - general
			Corporate income tax reduction/holiday - manufacturers of Evs/ components
			Excise duties incentives for lower powered Evs
			Custom duties incentives for lower powered Evs
		Policy frameworks and action plans	Pronouncement of support for vehicle conversion
			General pronouncement of support for Evs production / assembly / import
			Import-based EV target
	Other	Total EV fleet target	
	Usage	Fiscal incentives and disincentives	Road use tax waiver or reduction for Evs
			Pollution tax - differential
Annual vehicle tax - exemption			
Policy frameworks and action plans		EV Modal targets	
Non-fiscal /incentives/disincentives		General pronouncement of support for EV usage	
General	General	Fiscal incentives and disincentives	Distinct registration plates for Evs
			General Subsidy (No information)
		Policy frameworks and action plans	General pronouncement of support for emobility
			General pronouncement of support - RE
Infrastructure	General	Policy frameworks and action plans	General EV industry plan
			Defined institutional setup
	Provision of infrastructure	Policy frameworks and action plans	Electric infrastructure targets
			General pronouncement of support for charging infrastructure
			Land acquisition for emobility
			Charging stations integration into public transport stations-general support
			Rail infrastructure - target

Note: The graph and the table above mainly representative of the policy measures that had been collected, collated and categorized by the authors. The authors make no claims about the completeness of the list, nor the accuracy of the categorization.

Endnotes

Photo: "Kathmandu Tempo Stand– Ratna Park" by Sharada Prasad CS used under CC BY 2.0 / Cropped and recoloured from original

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21 Information provided by the Energy Efficiency Section of the National Energy Agency to the Society of Engineers Nepal (SOTEN). NEA operates 51 stations, and various stations are being operated by private sector entities (e.g. [BYD Nepal](#), [Hyundai Nepal](#), [MG Motors Nepal](#), [Tata Motors](#), [CG NETA](#), among others)

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