

Nexus between Transport and Renewable Energy



India

India is largely setting the right incentive frameworks for shifting to more efficient vehicles and expanding renewable electricity generation. Removing remaining subsidies on electricity and supporting linkages among sectors (e.g. using electric two- and three-wheelers for power storage) could benefit households and improve air quality.

Country Typology Framework

This framework is the basis for an analysis of fossil fuel subsidy reform and renewable energy scale up in the transport sector, which can reduce carbon emissions and generate tax revenues for sustainable development.

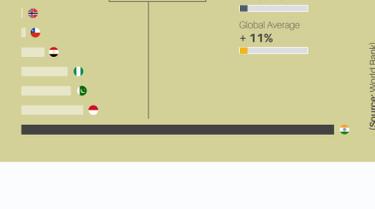


GDP per capita 2019

(PPP (constant 2017 International \$) per capita)



Population 2019



Fossil Fuel Energy



Share of power generation in total fossil fuel CO₂ emissions



Total energy supply per capita (TJ/cap) (2019)



Remaining subsidies are dedicated to support schemes for kerosene and LPG to low-income families, mostly used for cooking and lighting. Additional direct subsidies for electricity exist to enable below-market electricity prices.
(Source: OECD, IISD)



Production support is minimal and mostly dedicated to research programmes in the coal sector.
(Source: OECD)



Subsidies for petrol and diesel were eliminated in 2014.
(Source: OECD, IISD)

150.1 billion

Since the beginning of the COVID-19 pandemic in early 2020, India committed at least 150.1 billion to support all energy types through new or amended policies, according to official government sources and other publicly available information.
(Source: REN21)

Renewable Energy

Share of renewables in:

Primary energy* (%) Electricity generation (%)



(Source: REN21)

Renewable electricity (solar PV/CSP*)

Installed (2018): 43 GW Target (2022): 100 GW

* Photovoltaic / Concentrating Solar Power

India has set targets for 60 GW wind and 5 GW small-scale hydro generation capacity by 2022.

(Source: REN21)

*Primary energy refers to all energy used in a country before transformation and encompasses all uses, including all non-electricity use of energy

Transport



(Source: IEA)



(Source: EDGAR)



(Source: EDGAR, World Bank)



(Source: IEA)

Motorisation rate 2015 (vehicles* per 1000 inhabitants)



(Source: OICA)

* passenger cars and commercial vehicles

VEHICLE ELECTRIFICATION

	Total number in use (2019)	Growth (2018 - 2019)	Number sold (2019)	Growth (2018 - 2019)
Electric Cars	11 192	23%	2 088	-0.8%
Electric 2-wheelers	600 000	N/A	152 000	21%
Electric 3-wheelers	1 500 000	N/A	630 000	21%
Electric Buses	800	N/A	450	N/A

The national FAME 2 program is supporting electric passenger cars and buses through purchase subsidies and EV policies

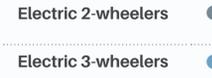
EV targets

(Source: REN21)



Additionally, 70% of commercial cars, 30% of private cars, and 40% of buses sales in 2030

BIOFUELS



(Source: REN21)



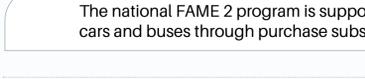
(Source: REN21)

Use (2019) Target (2030)

VEHICLE EFFICIENCY



(Source: ICCT LDV)



(Source: ICCT HDV)

Other transport targets

(Source: REN21)

Indian Railways to install 3 GW of solar capacity by 2022-23 and aims to develop 5 GW of solar capacity by 2025.

Threats and Opportunities

ENERGY

THREATS
Strong regional and national government support for electric vehicles will substantially increase demand for renewable energy. This additional demand will need to be supported by strong national renewables programs, which do not currently consider transport demand impacts.

Existing biofuel regulations to ease fossil fuel consumption are lower than in peer countries, putting additional pressure on oil imports. Insufficient biofuel regulations increase the need for electricity, and thus increase stress on the electricity system.

OPPORTUNITIES
India's petrol and diesel subsidy phase out in 2014 sent strong market signals. This could build the foundation for a tax increase to further incentivise fuel efficient vehicles and ultimately electrification.

India has the technical potential to considerably increase its 20% share of renewables in the coming decade. This share has created a vibrant renewables sector, which could be further expanded by linking renewable energy to transport sector decarbonisation.

Redirecting subsidies to enhance renewable energy access for low-income households and linking this energy to electric vehicles (including two- and three-wheelers) could create more reliable energy storage and grid management.

TRANSPORT

India's passenger car fleet is expanding, with a rising trend towards SUVs (which accounted for 37% of car sales 2019). India's national freight activity is projected to increase about five-fold by 2050 (NITI Aayog/RMI).

Maintaining existing fossil fuel subsidies makes investments in efficiency measures and renewables less attractive, leaving low-cost mitigation options untapped.

Two- and three wheelers are the most widely used transport modes in India. The 2030 electrification target for these modes will help lower carbon emissions and reduce noise and air pollution in Indian cities.

Raising light- and heavy-duty vehicle fuel efficiency standards and introducing fuel efficiency standards for two- and three wheelers would reduce the need for oil imports and reduce GHG and particulate emissions.

Increased investment in rail could help address the substantial increase in fuel consumption projected in the freight sector, particularly if combined with the ongoing electrification of the railway network.