Climate Transparency

CLIMATE ACTION TRACKER

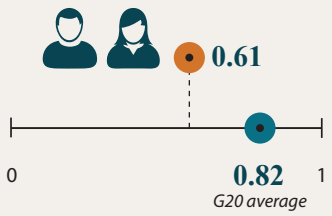
CLIMATE CHANGE PERFORMANCE index 2016

BROWN TO GREEN: G20 TRANSITION TO A LOW CARBON ECONOMY

India

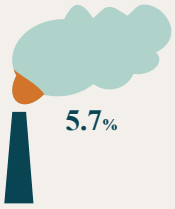
This country profile assesses India's past, present and indications of future performance towards a low-carbon economy by evaluating emissions, decarbonisation, climate policy performance and climate finance. The profile summarises the respective findings from, amongst others, the Climate Change Performance Index (CCPI, operated by Germanwatch and Climate Action Network Europe), the Climate Action Tracker (CAT, operated by Climate Analytics, NewClimate Institute, Ecofys and Potsdam Institute for Climate Impact Research), and analyses from the Overseas Development Institute (ODI).

Human Development Index



Source: UNDP, data for 2015

Share of global GHG emissions



GHG emissions per capita (tCO_2e/cap)

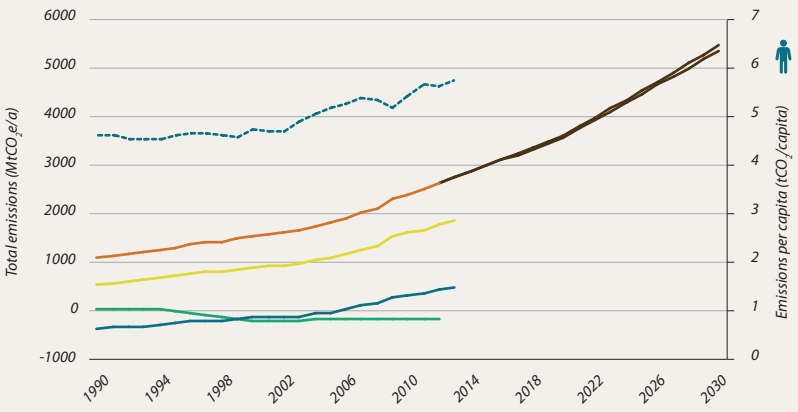
Source: World Bank Indicators, data for 2012

Share of global GDP

GDP per capita

Source: IEA, data for 2013

GREENHOUSE GAS (GHG) EMISSIONS

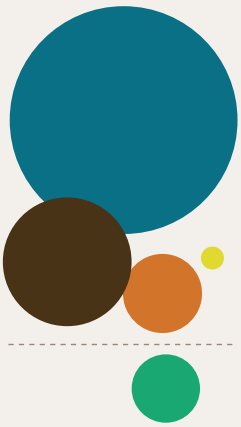


- *Historic emissions (excluding forestry)*
- *Energy-related CO_2 emissions*
- *Energy-related CO_2 emissions per capita*
- *Current policy emissions projections (excluding forestry)*
- *Historic forestry emissions/removals*
- *G20 average of energy-related CO_2 emissions per capita*

India's GHG emissions increased from 1090 $MtCO_2e$ in 1990 to 2624 $MtCO_2e$ in 2012. In the next decade, a rapid growth is expected that will nearly double the country's GHG emissions. Emissions from land use, land use change and forestry (LULUCF) are in the negative range, acting as a net sink of emissions. Around 70% of GHG emissions are from energy-related carbon dioxide (CO_2). With 1.5 tCO_2 per capita, emissions are very low compared to other G20 countries, but a steady increase is visible. The CCPI has evaluated India's emissions levels as relatively good, but with a worsening trend.

CCPI evaluation of emissions level and trend

- *Level*
- *Weak trend*
- *Strong trend*



Composition of GHG emissions

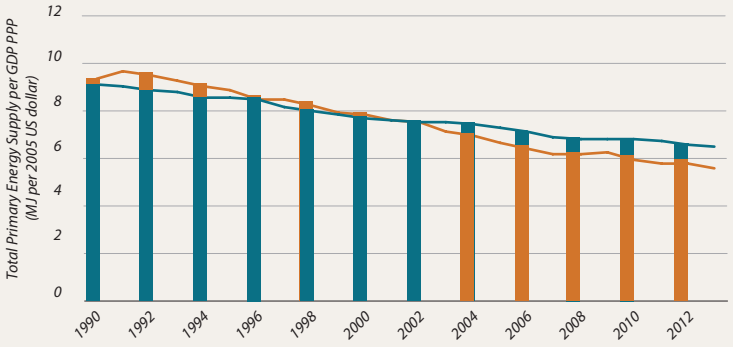
CO_2*	69%
N_2O	8%
CH_4	22%
F-Gases	1%
CO_2 emissions from forestry	-6%

*CO_2 emissions incl. LULUCF
Source: Annex I countries: UNFCCC (2015); Non-Annex I countries: IEA (2014) and CAT (2015)

Sources: Past energy related emissions from the Climate Change Performance Index (CCPI); past non-energy and future emissions projections from the Climate Action Tracker (CAT). CCPI calculations are primary based on the most recent IEA data; CAT calculations are based on national policies and country communications.

DECARBONISATION

Energy intensity of the economy



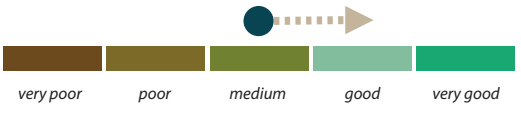
Due to mitigation activities being implemented since 1992, the energy intensity of India's economy (TPES/GDP) has gradually decrease over the years and remains below the G20 average since 2002. The CCPI evaluates India's energy intensity level as medium, but with a positive trend.

Energy intensity

Average energy intensity in G20

Source: CCPI, 2016

CCPI evaluation of energy intensity of GDP

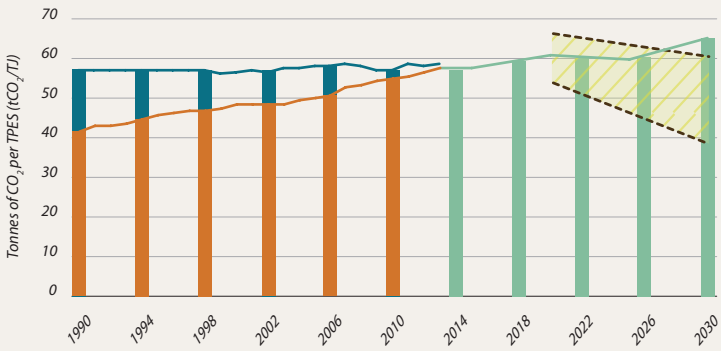


Level

Weak trend

Strong trend

Carbon intensity of the energy sector



India's emissions per primary energy (CO2/TPES) have strongly increased over the years. CO_2 intensity is still marginally below the G20 average, but predictions assume that, with further growth in the next decade, it will not stay in line with a 2°C-compatible pathway. The CCPI evaluates the carbon intensity of India's energy sector as poor, and recognises a negative trend.

Carbon intensity (past trend)

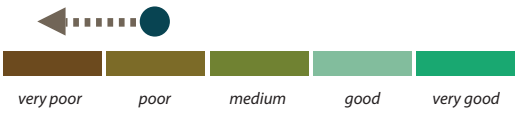
Average carbon intensity in G20

Carbon intensity (current policy projection)

Global benchmark for a 2°C pathway

Sources: Past: CCPI; future projections: CAT

CCPI evaluation of carbon intensity of energy sector

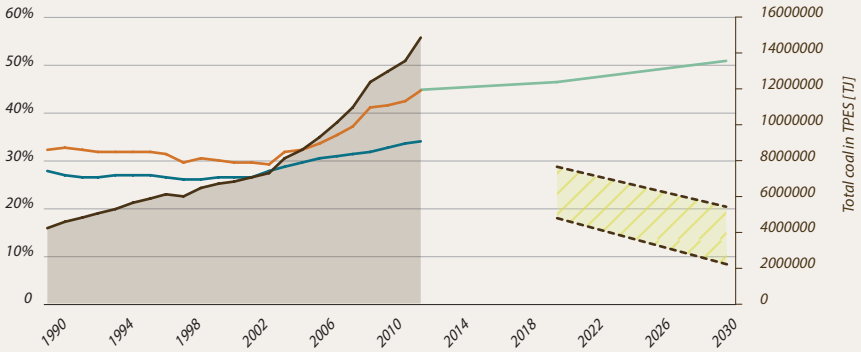


Level

Weak trend

Strong trend

Share of coal in Total Primary Energy Supply (TPES)



% of coal (past trend)

Average % of coal in G20

% of coal (current policy projections)

Global benchmark for a 2°C pathway (min & max)

Total coal consumption (TJ)

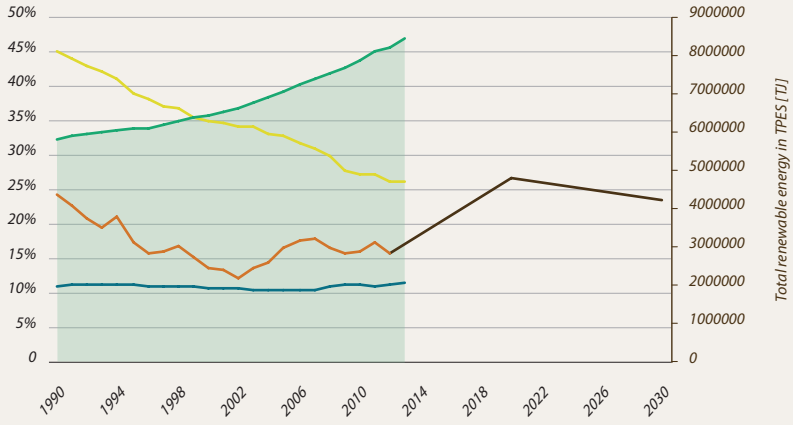
Source: CAT

Coal plays an important role in India's total primary energy supply. Already, at the beginning of the assessment period, India's share of coal was - at 33% - relatively high compared with other G20 countries. A strong increase in coal capacity began in 2003, which led to an even higher share of coal in the energy supply, increasing to 45% by 2012. This growth is predicted to continue until 2030 to a level far above a 2°C-compatible pathway.

Evaluation of coal share in TPES

Source: own evaluation

Renewable energy in TPES and electricity sector



% of renewable energy in electricity (past trend)

% of renewable energy in TPES (past trend)

% of renewable energy in electricity (current policy projections)

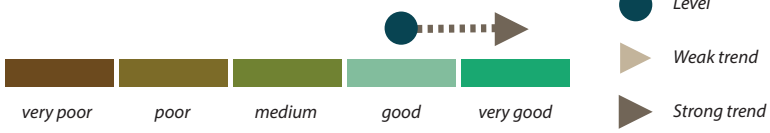
G20 average % of renewable energy in TPES

Total renewable energy consumption (TJ)

Sources: CCPI and CAT

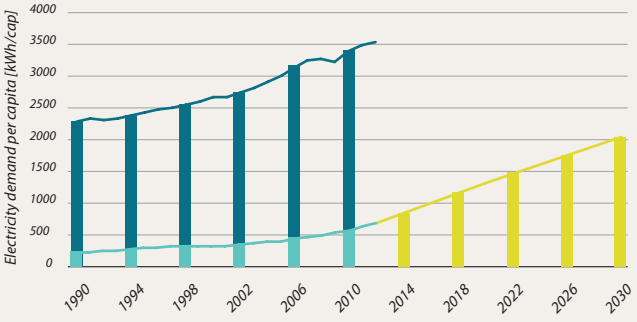
The share of renewable energy in electricity decreased from 24% in 1990 and reached an all-time low of 12% in 2002. Since then, the share began rising again and is expected to reach 1990 levels of 24% by 2030. The share of renewable energy in the country's total primary energy supply is relatively high compared to other G20 countries, but is currently falling. The CCPI ranks India's level of renewable energy as relatively good and, due to a rising overall amount of renewables in total primary energy supply, recognises a positive trend.

CCPI evaluation of renewable share in TPES



Electricity demand per capita

India's electricity demand per capita is very low compared to other G20 countries, though demand has been constantly rising since 1990. According to future projections, this development will continue.



Electricity demand per capita (past trend)

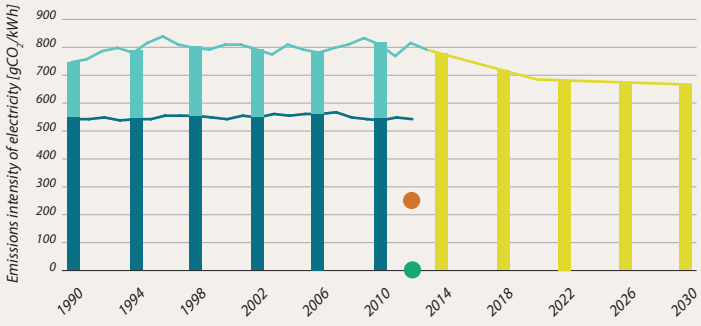
Electricity demand per capita (current policy projections)

Average electricity demand per capita in G20

Source: CAT, 2015

Emissions intensity of the electricity sector

India's electricity emissions intensity increased until 1996 and has been wavering at around 800 gCO_2 per kWh since then, which is relatively high compared to other G20 countries. Future projections show that emissions intensity will stabilise around 670 gCO_2 per kWh by 2030.



Emissions intensity (past trend)

Average emissions intensity in G20

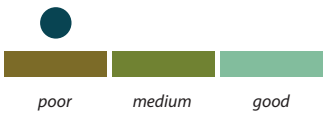
Emissions intensity (current policy projections)

Good practice benchmark: without nuclear or large hydro potential (Denmark)

Good practice benchmark: with large hydro potential (Norway)

Source: CAT, 2015

Evaluation of the electricity emission intensity



Source: own evaluation

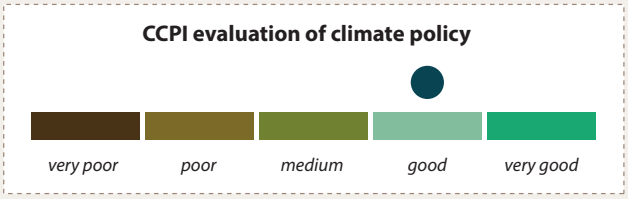
CLIMATE POLICY PERFORMANCE

Checklist of the climate policy framework

Low emissions development plan for 2050 (1)	✗
2050 GHG emissions target	✗
Building codes, standards and incentives for low-emissions options	✓
Support scheme for renewables in the power sector	✓
Emissions performance standards for cars	✓
Emissions Trading Scheme (ETS)	✗ (2)
Carbon tax	✓ (3)

(1) Understood as decarbonisation plans and not specifically as the plans called for in the Paris Agreement
(2) India has an energy efficiency certificate scheme covering energy-intensive industry unit and power stations.
(3) Although not an explicit carbon tax, India has a nationwide tax on coal, both produced and imported.

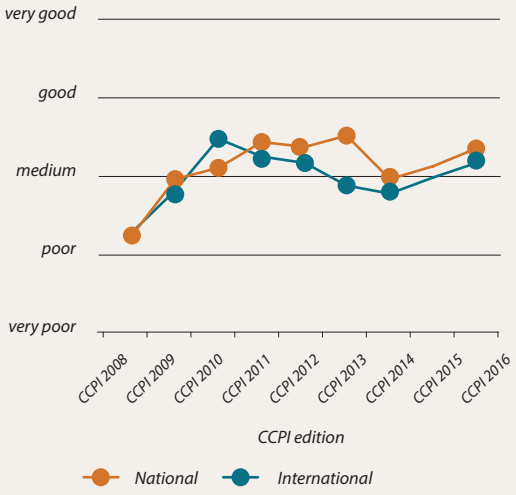
Source: Climate Policy Database, 2016



Climate policy evaluation by experts

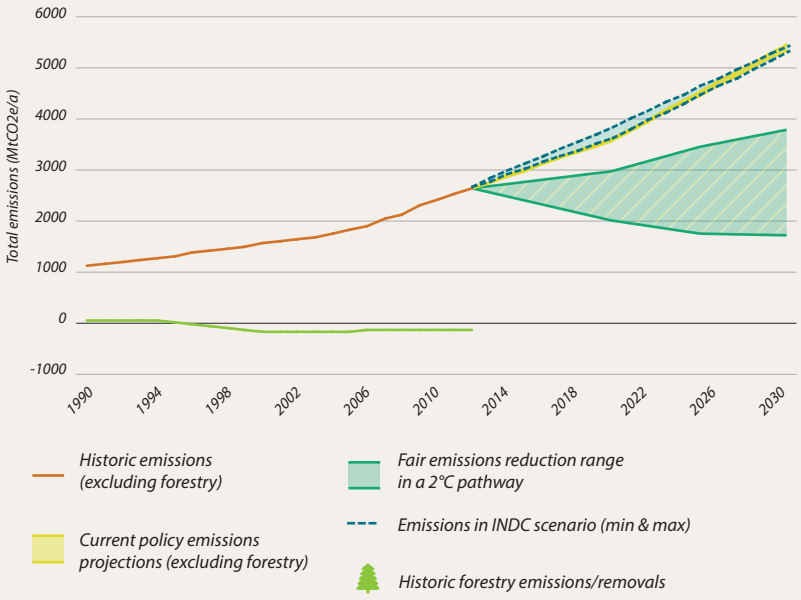
National experts acknowledge India's ability to meet its climate targets, but claim some could be more ambitious. CCPI experts appreciate a solid policy framework to promote renewable energy, while noting coal is important to meet increasing electricity demand. The overall evaluation of India's climate policy performance is relatively good.

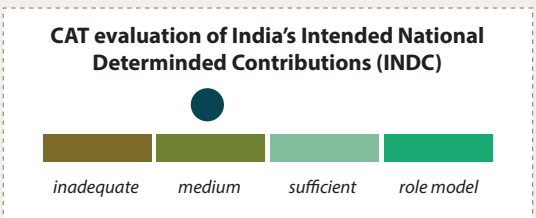
The CCPI evaluates a country's performance in national and international climate policy through feedback from national energy and climate experts.



Source: CCPI, 2016

Compatibility of national climate targets (INDCs) with a 2°C scenario





Source: CAT, 2015

India's INDC, submitted 1 October 2015, includes several targets. It aims to lower GDP emissions intensity by 33–35% below 2005 levels by 2030. Its existing pledge aims to cut GDP emissions intensity by 20–25% below 2005 levels by 2020. Further, the INDC aims to increase the non-fossil fuel share in installed power capacity to 40% in 2030, equivalent to 26–30% of power generation in 2030. Finally, it aims to increase forest and tree cover that will act as a carbon sink of 2.5–3 bn tonnes of $C0_2$ equivalent by 2030.

Under its current policies, including a target to install 175 GW of renewable power generation by 2022, the CAT projects the share of non-fossil fuels will reach 36% in 2030: equivalent to 24% share of power generation. Depending on how India plans to meet its 40% non-fossil target (through renewables and/or nuclear power), this would result in additional emissions savings of 58–155 $MtCO_2e$ by 2030, or 1–3% below current policy projections.

The CAT rates India's INDC as "medium" as it is only consistent with limiting warming below 2°C if other countries make a comparably greater efforts and much deeper reductions.

FINANCING THE TRANSITION

Investment attractiveness

Allianz Energy and Climate Monitor	MEDIUM
RECAI (E&Y index) Category (own assessment)*	HIGH
*Trend***	=

**Adapted from RECAI and re-classified in 3 categories (low, medium, high) for comparison purposes with Allianz Monitor.*

***Taken from RECAI issue of May 2016*

The indices rate India's investment attractiveness as medium to high*, due to ambitious renewable energy targets (particularly solar power), national legislation on implementing the targets and multiple recent pledges of major investors to develop projects. Land acquisition, uncertain local support and the financial weakness of distribution companies remain major obstacles for future investment attractiveness.

** RISE index developed by the World Bank gives a similar score to India*

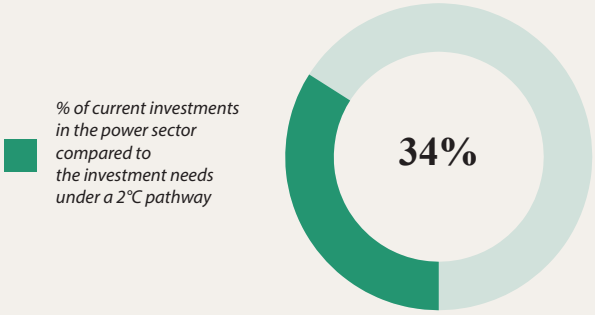
Sources: Allianz Energy and Climate Monitor and RECAI reports

The Allianz Energy & Climate Monitor ranks G20 member states on their relative fitness as potential investment destinations for building low-carbon electricity infrastructure. The investment attractiveness of a country is assessed through four categories: Policy adequacy, Policy reliability of sustained support, Market absorption capacity and the National investment conditions. The Renewable Energy Country Attractiveness Index (RECAI) produces score and rankings for countries' attractiveness based on Macro drivers, Energy market drivers and Technology-specific drivers which together compress a set of 5 drivers, 16 parameters and over 50 datasets.

Historical investments in renewable energy and investment gap

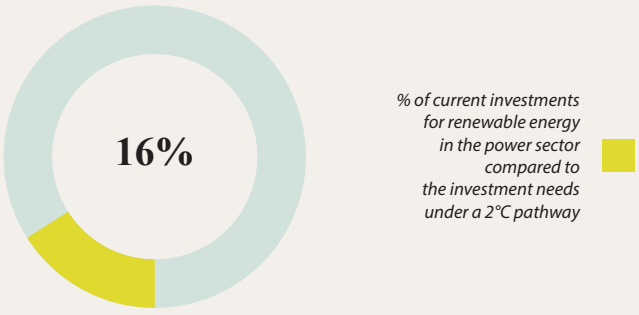
This section shows India's current investments in the overall power sector (including distribution and transmission) as well as in renewable energy expressed as the share of the total annual investments needed to be in line with a 2°C compatible trajectory.

Investments in the power sector



% of current investments in the power sector compared to the investment needs under a 2°C pathway

Investments in renewable energy for the power sector



% of current investments for renewable energy in the power sector compared to the investment needs under a 2°C pathway

Source: Adapted from WEIO, 2014[1]

[1] WEIO (2014) compares annual average investments from 2000 to 2013 with average annual investments needed from 2015 to 2030 under a 2°C scenario

Carbon pricing mechanisms

Emissions Trading Schemes (ETS)

An ETS caps the total level of GHG emissions and allows industries to trade allowances based on their marginal abatement cost. By creating a supply and demand for allowances, an ETS establishes a market price for GHG emissions.

Carbon Tax

A Carbon tax directly sets a price on carbon by defining a tax rate on GHG emissions or – more commonly – on the carbon content of fossil fuels. Unlike an ETS, a carbon tax is a price-based instrument that pre-defines the carbon price, but not the emissions reduction outcome of a carbon tax.

In 2010, India introduced a nationwide coal tax of 50 rupees (US$ 1.07) per tonne of coal both locally produced and imported. The tax has increased progressively and reached 400 rupees per tonne in 2016. Its revenues help finance the National Clean Environment Fund (NCEF).

Further, India has in place an energy efficiency certificate scheme called Perform Achieve and Trade (PAT). The PAT covers energy-intensive industry units and power stations in India. The scheme is considered one of the government's contributions to climate change mitigation as it enables companies to trade energy efficiency certificates to comply with their energy intensity targets under the PAT.

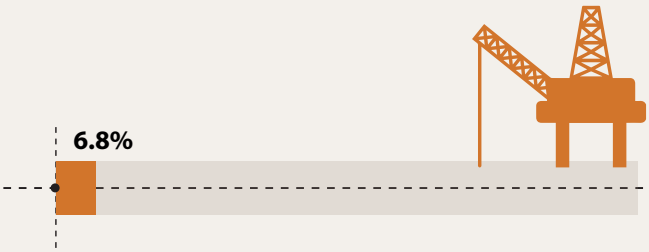
Sources: World Bank and Ecofys, 2016; other national sources

Fossil fuel subsidies

India is the world's third largest producer of coal, which accounts for over 70% of its energy production. In the past, India provided subsidies through the regulation of petrol, diesel, LPG and kerosene prices, compensating oil marketing companies for selling these products at a subsidised price. However, due to growing fiscal pressures and climate change priorities, the Indian government initiated fossil fuel subsidy reforms in 2010 by liberating petroleum pricing. It deregulated diesel prices in 2014. The Ministry of Petroleum and Natural Gas provided no capital for exploration and production of crude oil and natural gas in 2013-14, compared to US$45.7 million in the previous year.

Average annual national subsidies (2013-14)*

% of government's income from oil and gas production (2013)*



Source: ODI, 2015

**The indicators above refer only to subsidies for fossil fuel production, and include direct spending (e.g. government budget expenditure on infrastructure that specifically benefits fossil fuels), tax expenditure (e.g. tax deductions for investment in drilling and mining equipment) and other support mechanisms (e.g. capacity mechanisms).*

Public climate finance

India is not listed in Annex II of the UNFCCC, and it is therefore not formally obliged to provide climate finance. While climate-related spending by multilateral development banks may exist, it has not been included in this report.