

# THE INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICMAI)

(Statutory body under an Act of Parliament)



## Green Finance

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## Global Summit 2023

Unlocking Sustainability: G20 Presidency Paves the Way for  
an ESG-driven New World Order

Zorawar Auditorium, Manekshaw Centre, Delhi  
July 14 and 15, 2023

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# Greenhouse Gas

- A greenhouse gas (GHG or GhG) is a gas that absorbs and emits radiant energy at thermal infrared wavelengths, causing the greenhouse effect.
- The primary greenhouse gases in [Earth's atmosphere](#) are [water vapor](#) (H<sub>2</sub>O), [carbon dioxide](#) (CO<sub>2</sub>), [methane](#) (CH<sub>4</sub>), [nitrous oxide](#) (N<sub>2</sub>O), and ozone (O<sub>3</sub>).
- Without greenhouse gases, the average temperature of [Earth's surface](#) would be about –18 °C (0 °F), rather than the present average of 15 °C (59 °F).

# Greenhouse Gas

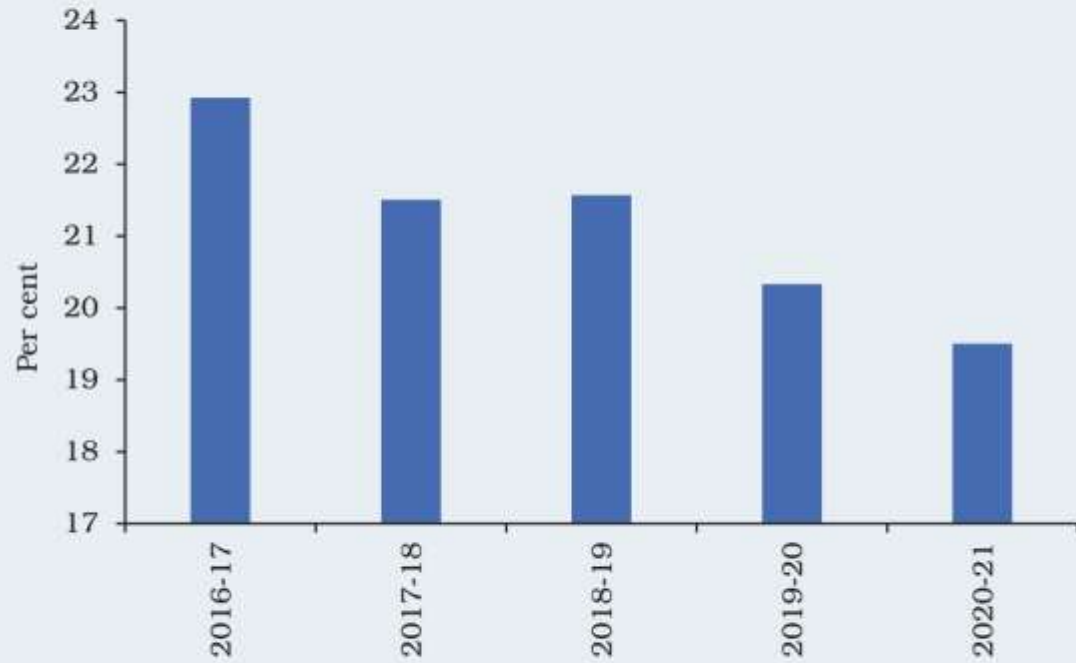
- India's Per Capita Greenhouse Gas Emissions Far Below World Average: UNEP Report.
- The world's average per capita GHG emissions – including land use, land-use change, and forestry – was 6.3 tCO<sub>2</sub>e (tonne carbon dioxide equivalent) in 2020. India's was 2.4 tCO<sub>2</sub>e.<sup>2</sup>

# Net Zero

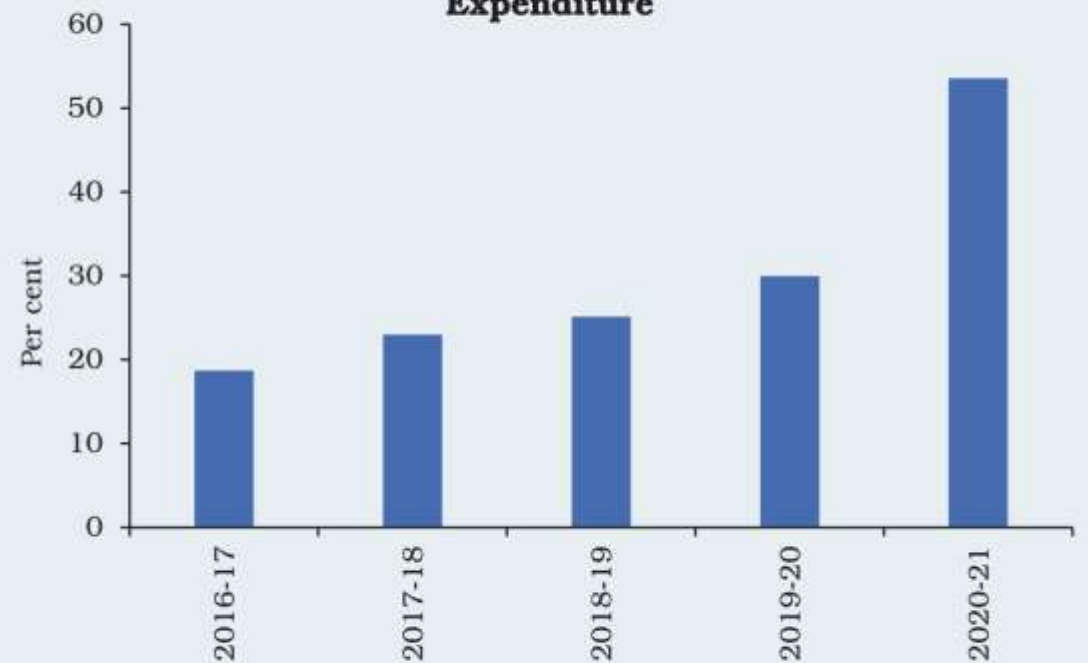
- Net Zero means cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere, by oceans and forests for instance.

**Chart IV.13: CSR Expenditure by Companies**

**a: Share of Top 10 Companies in Total CSR Expenditure**



**b: Share of Companies Reporting Higher than Prescribed CSR Expenditure**



**Source:** National CSR Portal.

**Chart IV.12: Sector-Wise CSR Expenditure**



**Source:** National CSR Portal.

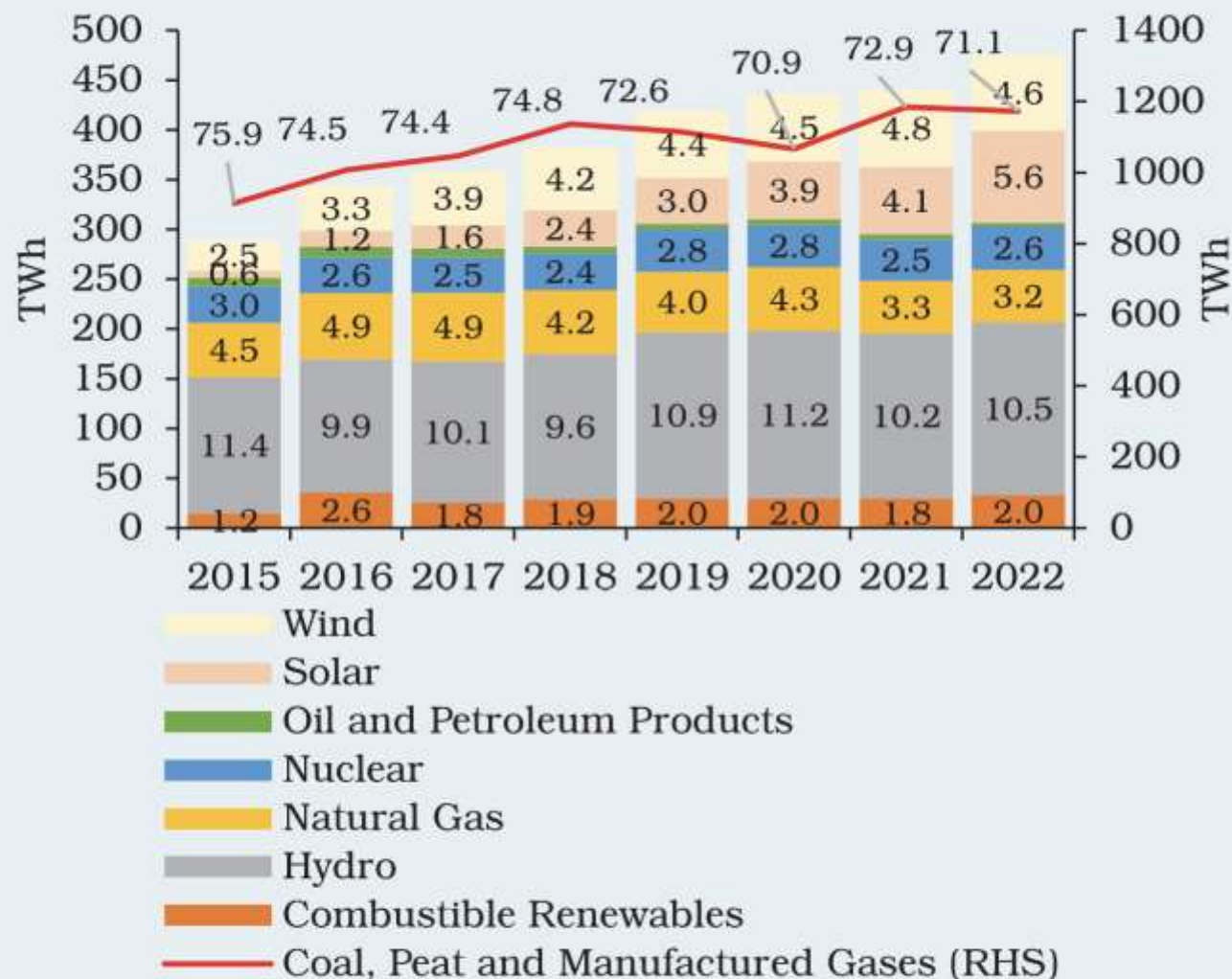
**Table IV.5: Machine Learning and its Deployment for Climate Change Solutions**

Solution Domain	Causal Inference	Computer Vision	Interpretable Models	Natural Language Processing	Reinforcement Learning and Control	Time-Series Analysis	Transfer Learning	Uncertainty Quantification	Unsupervised Learning
<b>Electricity systems</b>									
Enabling low-carbon electricity		✓	✓		✓	✓		✓	✓
Reducing current-system impacts		✓				✓		✓	✓
Ensuring global impact		✓					✓		✓
<b>Transportation</b>									
Reducing transport activity		✓				✓		✓	✓
Improving vehicle efficiency		✓			✓				
Alternative fuels & electrification					✓				✓
<b>Buildings and cities</b>									
Optimising buildings	✓				✓	✓	✓		
Urban planning		✓				✓	✓		✓
The future of cities				✓			✓	✓	✓
<b>Industry</b>									
Optimising supply chains		✓			✓	✓			
Improving materials									✓
Production & energy		✓	✓		✓				
<b>Farms &amp; forests</b>									
Remote sensing of emissions		✓							
Precision agriculture		✓			✓	✓			
Monitoring peatlands		✓							
<b>Carbon dioxide removal</b>									
Direct air capture									✓
Sequestering CO <sub>2</sub>		✓						✓	✓
<b>Climate prediction</b>									
Uniting data, ML & climate science		✓	✓			✓		✓	
Forecasting extreme events		✓	✓			✓		✓	

Source: Rolnick *et al.* (2023).



**Chart IV.7: Net Electricity Production by Source (TWh)**



**Note:** Data labels show percentage shares, calculated as a per cent of total net electricity generation; they may not add to 100.

**Source:** IEA Monthly Energy Statistics, and Authors' calculations.

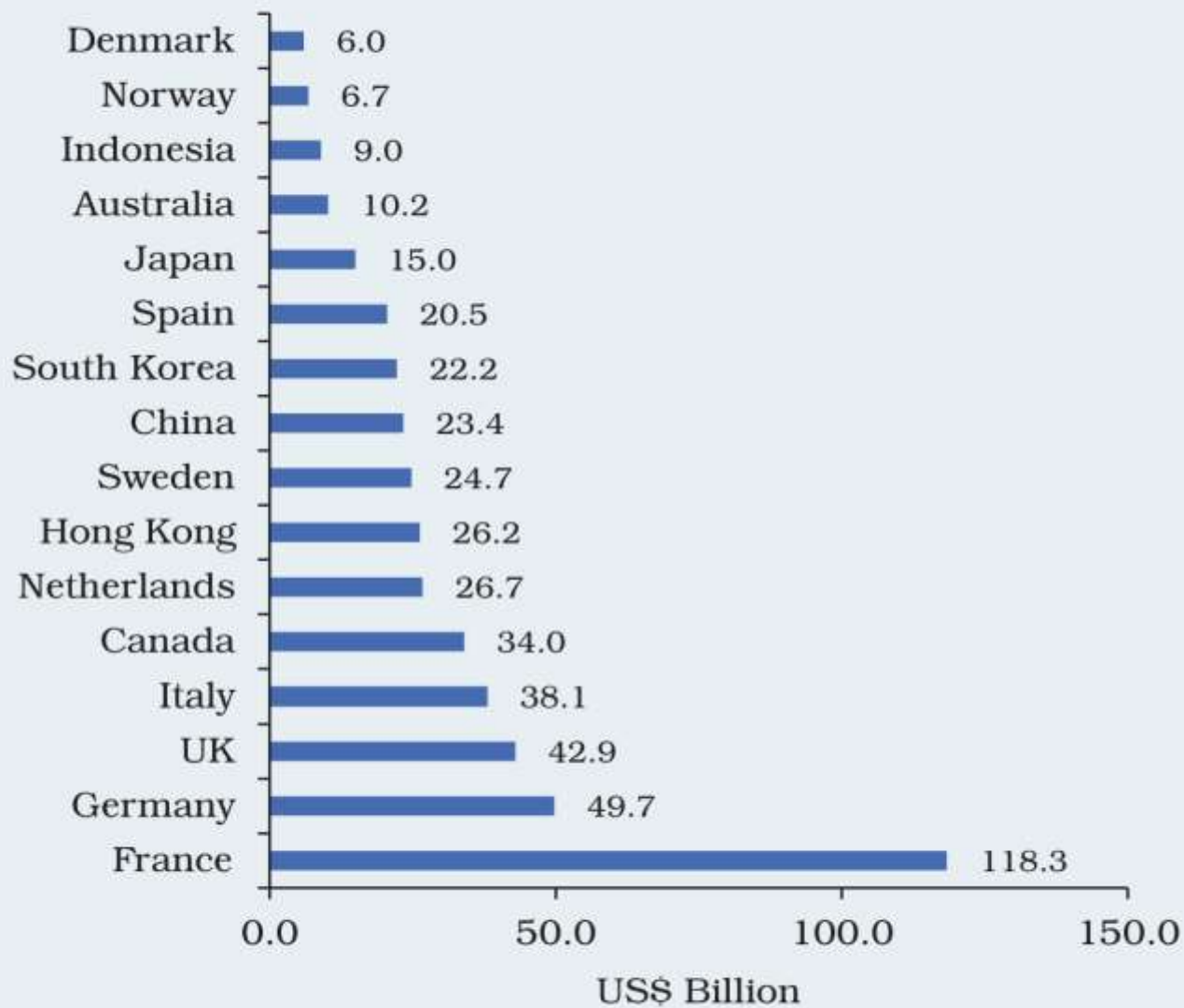
## **Box IV.1**

### **Emerging Market (EM) Green Bonds: The Significance of Greenium**

'Greenium'- a premium over vanilla bonds, is an integral feature of a successful green bond issuance strategy. JP Morgan's EM Green Bond Index outperformed the comparable JP Morgan EM Bond Index in 2022, extending the cumulative over-performance since December 2017 to 790 basis points (bps) (IFC, 2021; Bloomberg, 2022). When the green bond index outperforms the conventional bond performance, the greenium widens (Chart 1).

Global financial conditions have influenced the evolution of the spread between the return on EM green bonds and their non-green counterparts. A tighter global financial condition (proxied by the US financial conditions) is associated with an increase in the spread, and the association almost doubled from the pre-COVID to post-Covid period. For example, the correlation was 0.31 in the pre-COVID period (2018 M01- 2020 M02) and rose

**Chart IV.5: Sovereign Green Bond Issuances**



**Note:** The chart represents the total SGB issuances of each country as of mid-April 2023.

**Source:** Bloomberg, accessed on April 19, 2023.

**Table IV.3: Carbon Pricing Mechanism in Emerging Market Economies**

Name	GHG Emissions (as per cent of World emission)	Status	Description	Scope (Share of GHG emissions covered)
Argentina	0.80	Carbon Tax (Implemented)	Implemented a Carbon tax in 2018, replacing the fuel tax	20 per cent
Brazil	2.92	ETS (TBC)	National Climate Policy aims to promote ETS. Since 2013, a group of leading companies have participated in a voluntary ETS simulation	Not decided
China	24.23	ETS (Implemented)	The world's largest ETS, in terms of covered emissions, was implemented in 2021.	33 per cent.
Indonesia	3.94	Carbon Tax (Implemented) / ETS (TBC)	Passed a law to implement carbon tax in October 2021, Working towards a mandatory ETS in the power sector	26 per cent using Carbon tax
South Korea	1.31	ETS (Implemented)	Launched a cap-and-trade based ETS at a national level in 2015	73 per cent.
Malaysia	0.80	ETS (TBC)	Considering between Domestic ETS and Carbon tax	Not decided
Mexico	1.35	Carbon Tax (Implemented) / ETS (TBC)	Carbon tax is an excise tax under the special tax on production and services that was implemented in 2014	44 per cent.
Poland	0.64	Carbon Tax (Implemented)	Part of the Environmental Protection Act that covers CO <sub>2</sub> emission, dust, sewage, and waste.	3.75 per cent.
South Africa	1.13	Carbon Tax (Implemented)	Places a price on CO <sub>2</sub> emissions from large businesses in the industry, power, and transport sectors.	80 per cent.
Thailand	1.13	ETS (TBC)	Following COP 26, the government is developing guidelines for ETS, expected to be released in 2022	Not decided
Türkiye	1.31	ETS (TBC)	Laws governing monitoring, reporting, and verification (MRV) were implemented in Türkiye in 2012, and monitoring of GHG emissions from large installations began in 2015.	Not decided
India	6.75	Carbon Tax (TBC)	NA	NA

**Note:** TBC: To be confirmed.

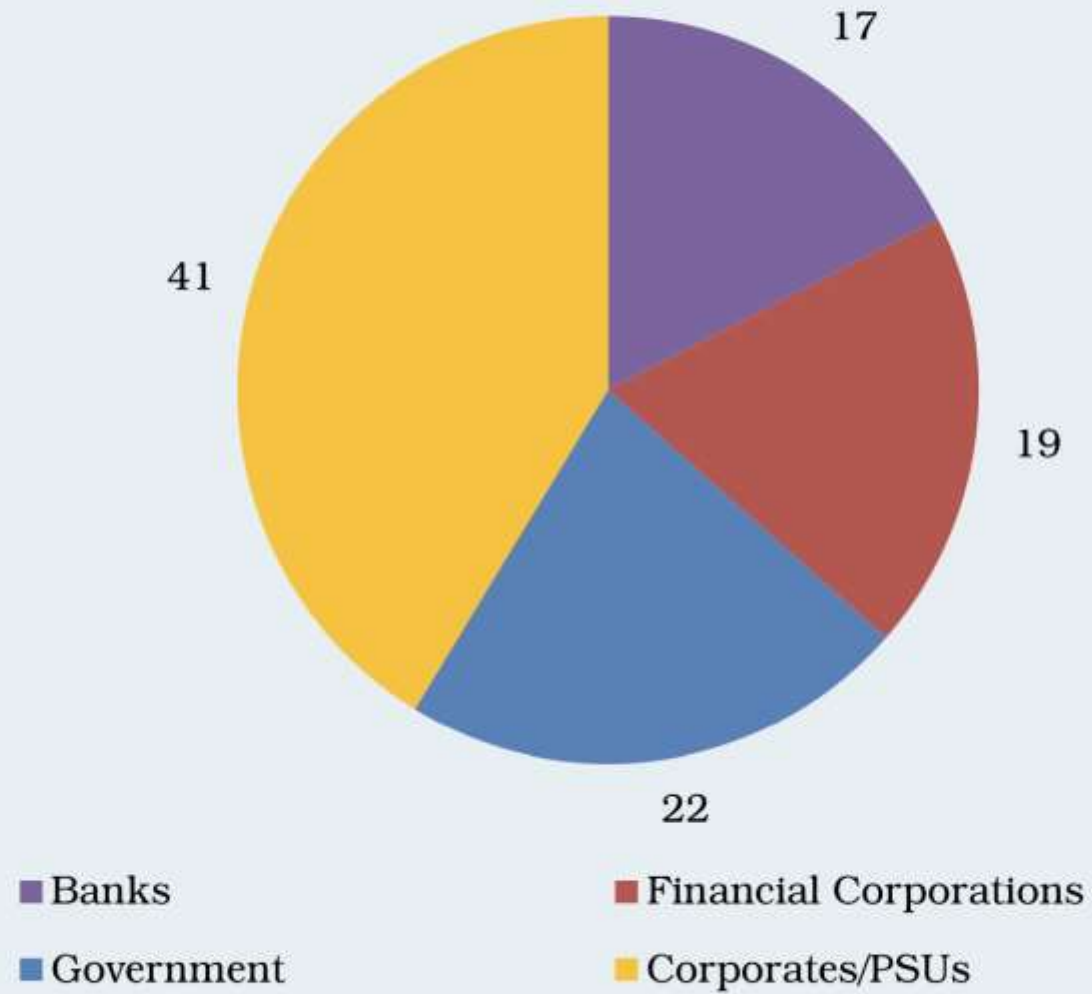
**Source:** Our World in Data.

## Table IV.2: Carbon Tax and ETS: Advantages and Disadvantages

	Carbon Tax	ETS
Advantage	Provides certainty about the price of carbon	Increases certainty about emission reductions and environmental benefits.
Disadvantage	The outcome of emission reductions is unknown.	The costs of achieving the desired level of abatement are unknown.

**Source:** Observer Research Foundation (2022).

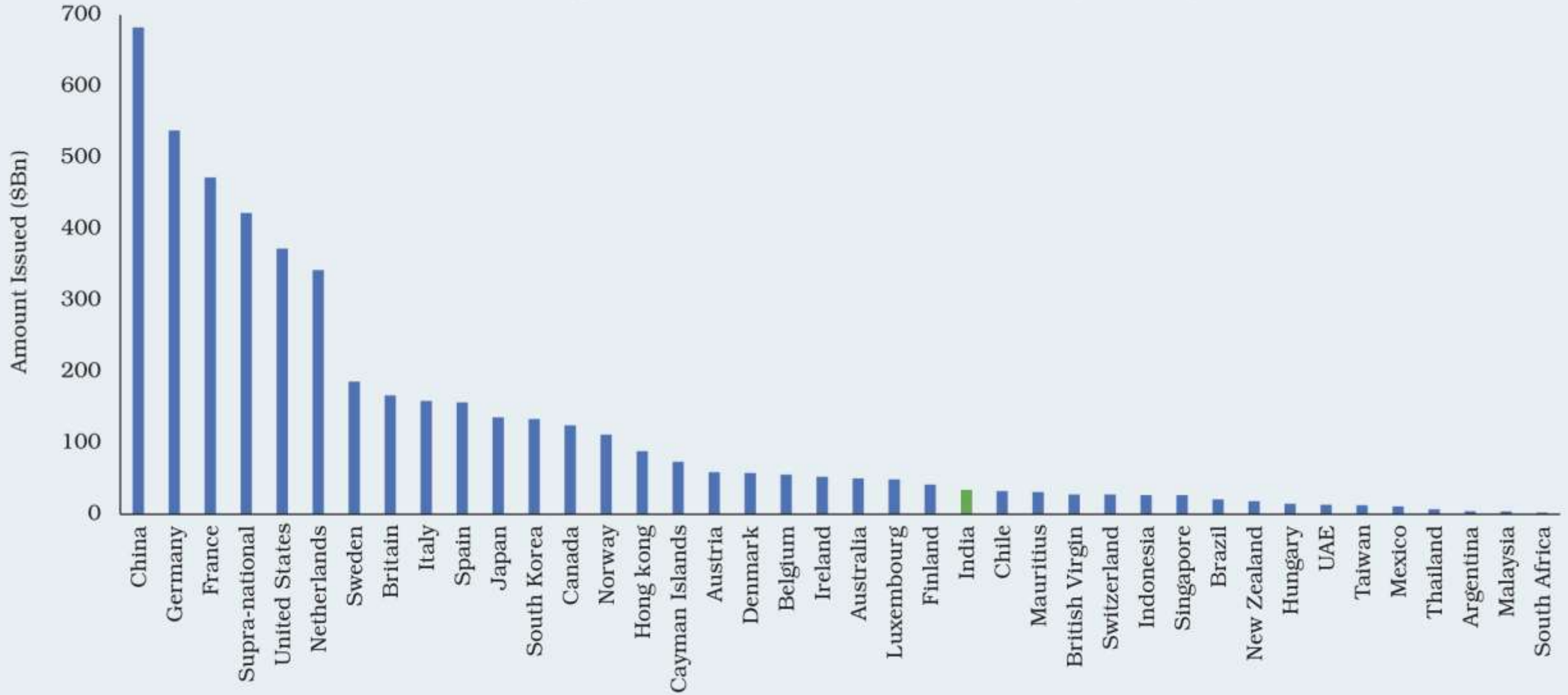
**Chart III.17: Issuer-wise Breakup of Green Bonds Issued in India (Per cent)**



**Note:** Government green bonds include municipal green bonds.

**Source:** Bloomberg data as on April 28, 2023.

**Chart III.16: Corporate and Government Green Bonds by Country**



**Notes:** 1. Government green bonds do not include municipal green bonds.  
 2. A Supra-national organisation relates to more than one country.

**Source:** Bloomberg data as on April 28, 2023.



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