

# Financing Just Transition through Emission Trading Systems

Challenges & Opportunities for India



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# EXECUTIVE SUMMARY

Climate finance is pivotal for the energy transition, with substantial needs anticipated. To address the growing demands in Asia and globally, policymakers are exploring effective revenue-raising tools. Globally, carbon pricing has become a vital decarbonization policy, encompassing greenhouse gas (GHG) emissions trading systems (ETS) and carbon taxes.

Numerous jurisdictions are implementing ETSs to enable cost-effective achievement of Nationally Determined Contribution (NDC) targets for GHG emission reductions under the Paris Agreement, and reduce negative impacts of carbon border adjustment mechanisms (CBAMs). A substantial further benefit of ETSs is the ability to generate essential climate finance through the auctioning of allowances. These revenues are allocated for decarbonization of power and industrial sectors, supporting vulnerable communities, and ensuring a just energy transition.

India's forthcoming Carbon Credit Trading Scheme (CCTS) presents an opportunity to secure significant financing for these purposes. To realise this opportunity in practice, policymakers must focus on an effective CCTS development plan, mechanisms for carbon cost pass-through in the power market, strategic revenue allocation, and robust governance structures for efficient fund management.

# INTRODUCTION

Climate finance is the centerpiece of the energy transition puzzle, and needs are high. A recent study suggests India needs USD 2 trillion until 2050 to achieve a just energy transition.<sup>1</sup> To meet India and Asia's rising needs, policy makers are seeking effective tools for raising revenue. Carbon pricing has been increasingly adopted globally as one of the critical decarbonization policies to achieve energy and climate action goals, including greenhouse gas (GHG) emissions trading systems (ETSs) and carbon taxes. Carbon pricing seeks to address the market failure associated with ignoring GHG emissions within the cost structure of the production of goods and services.

Climate change resulting from GHG emissions causes revenue loss and added government expenses due to social and economic damage caused by extreme weather events. Therefore, pricing emissions becomes an essential tool for tackling climate change by creating a financial incentive for lower-carbon products. Furthermore, a carbon pricing policy can be designed in a way that generates a substantial amount of revenue for the government, which can then be used to support key stakeholder groups in the transition to a low-carbon economy. Proper design and implementation of a carbon pricing policy, including its long-term development, must include the development of climate finance for the benefits of this policy to be fully realized.

With the passage of the Energy Conservation Amendment Act of 2022, the government of India has laid the foundation for the Carbon Credit Trading Scheme (CCTS), which comprises a mandatory credit-based emissions trading system for power and energy-intensive industry sectors (the compliance mechanism) and a voluntary project-based offset mechanism. These policy instruments are designed to enable India to achieve its Nationally Determined Contribution (NDC) targets under the Paris Agreement by driving decarbonization for major emitters, mobilizing investments in clean technologies, and reducing negative impacts of international policies including carbon border adjustment mechanisms (CBAMs). To fully leverage the potential of an effective carbon pricing policy, it is imperative to understand its different design levers and how they work.

One of the key desired elements of an ETS, as recognized globally, is auctioning of allowances for sectors that are not prone to carbon leakage. This embodies the “polluter pays principle” and creates a strong carbon price signal for GHG emissions reductions. A substantial added advantage of auctioning is that it enables the government to generate revenue that could be earmarked for climate- and energy-related purposes. The revenue earmarking could be designed to benefit entities' investments in clean energy and net zero transition, vulnerable households, communities dependent on the fossil fuel economy, and others. The CCTS compliance mechanism has the potential to generate significant revenue for the government that can be strategically earmarked to support a cost-effective and just low-carbon transition of India's economy, demonstrating global leadership and inspiring similar efforts in other major economies.

This policy paper focuses on the potential for generating revenue through India's ETS to support beneficial purposes, including just transition. Section 2 elaborates how an ETS works and why the auctioning of allowances within the ETS is important. Section 3 delves deeper into international experiences with auctioning and revenue earmarking within different jurisdictions. Section 4 provides recommendations for the CCTS in India, and Section 5 concludes the policy paper.

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<sup>1</sup> Bhushan, C. (2024) *Global report launch & webinar—just transition, just finance—iFOREST—International Forum for Environment, Sustainability & Technology*. Available at <https://iforest.global/events/global-report-launch-webinar-just-transition-just-finance/>. (Accessed April 5, 2024)

# HOW DOES AN EMISSION TRADING SYSTEM DRIVE DECARBONIZATION & GENERATE FINANCE?

## 2.1 TYPES OF EMISSIONS TRADING SYSTEMS

An ETS is a quantity-based policy instrument in which the regulator sets a target or cap on emissions of covered sectors and entities. Entities are given the flexibility to respond to the policy by improving energy efficiency, switching to lower-carbon fuels, implementing emissions reduction technologies, or buying allowances or credits either in government auctions or from other entities that have overachieved their emissions target. A carbon market enables the trading of allowances or credits, and a monitoring, reporting, and verification system is put in place to ensure compliance with the overall target or cap. The flexibility given to entities in how they comply and the incentivization of emissions reductions where they are the least expensive are the reasons why this policy is theoretically the most cost-effective. Entities can decide what strategy is best for them. Those entities that can easily reduce emissions, and at low cost, will be incentivized to do so, and they will be able to sell their surplus allowances or credits at a profit to entities that have more expensive emissions reduction options. The latter group also benefits because they can comply at a lower cost by buying allowances or credits than if they had to meet the targets entirely by reducing their own emissions.

Alternatively, the government could impose a price-based policy instrument such as a carbon tax. However, a carbon tax can be a costly policy instrument for industries, as it does not enable the free allocation of allowances for sectors exposed to the risk of carbon leakage.<sup>2</sup> Additionally, it is difficult to calculate the appropriate level of tax that should be imposed to achieve the required level of emissions reduction. In a market-based instrument such as an ETS, as targets become more stringent, the market pushes the allowance price to increase. However, for a tax system, the appropriate evolution of the tax rate is difficult to determine.

There are different types and designs of ETSs to suit the needs and circumstances of any country, as well as a well-established global trend for the evolution in design over time, based on learning by doing and achievement of increasingly ambitious reduction targets. Some of the key choices include the following:

1. **Type of target or cap**—The emissions cap could be a top-down absolute emissions cap or a bottom-up emissions intensity-based cap. The Indian CCTS is proposed to have intensity-based targets for each entity expressed as tonnes of GHG emissions per unit of product. China and Indonesia have also adopted this approach, which can be more suitable for countries where determining a reasonable level of an absolute cap would be challenging, in particular where economic growth rates are high and less predictable. In the longer term, an absolute cap, such as adopted in Europe, South Korea, and the United States and planned for Türkiye, will be a key consideration, given the certainty an absolute cap can provide in achieving targets, as well as its greater ability to support a well-functioning carbon market.

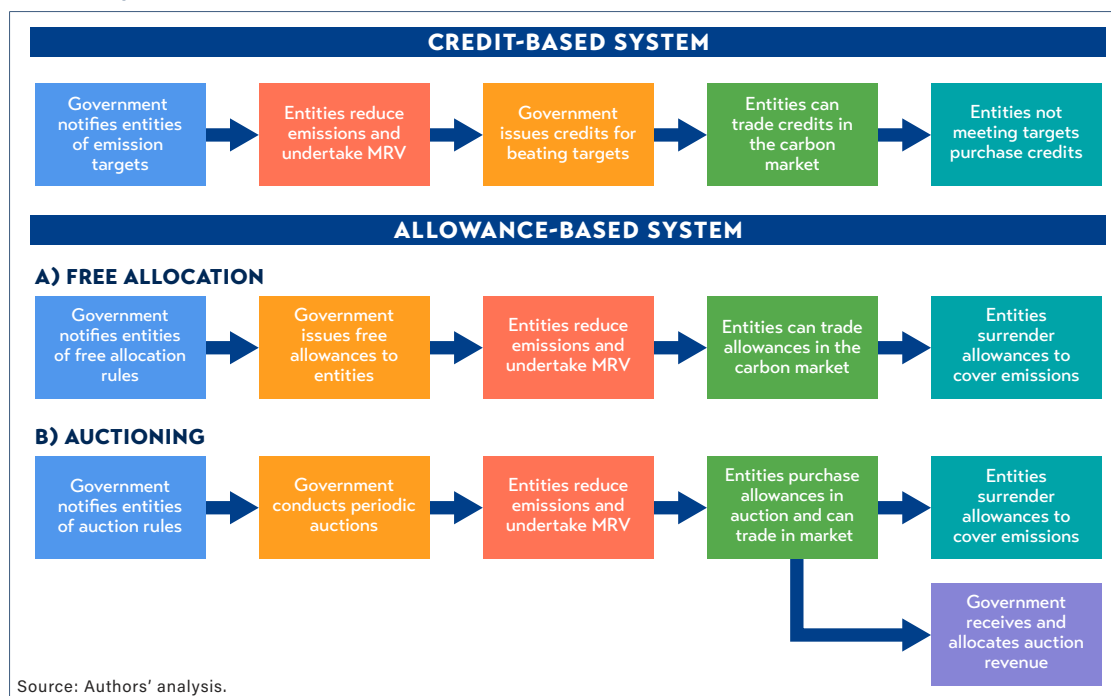
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2 Carbon leakage refers to when efforts to reduce GHG emissions in one jurisdiction lead to an increase in emissions elsewhere. This can happen when industries or companies relocate their operations to countries with less stringent environmental regulations. The result has a potentially negative impact on global emissions, undermining the original goals of climate policies. In the case of carbon pricing, companies could move their operations from jurisdictions with higher carbon prices to jurisdictions with comparatively lower carbon prices.



2. **Credit-based or allocation-based system**—In an ETS, the regulator can either provide emissions allowances at the beginning of the compliance period, within the overall cap, or provide carbon credits at the end of the compliance period. In the first case, which is the more commonly applied approach globally, the complying entity surrenders allowances corresponding to its emissions to the regulator. In a credit-based system, the regulator provides carbon credits to an entity if it has overachieved its emissions target. The CCTS, in building on the existing Perform, Achieve and Trade (PAT) scheme, will be a credit-based ETS in which entities that beat their targets will receive a carbon credit at the end of the compliance period. The entities can then sell the credits to other entities that would find it more cost-effective to buy credits than make their own emissions reductions. This baseline and credit system is also adopted in the Australian Safeguard Mechanism and the first (voluntary) phase of Japan's GX-ETS.
3. **Type of allocation**—Under an allocation-based system, allowances are given for free or by auction. Free allocation can be based on benchmarks of emissions intensity for a given product (“benchmarking”) or based on historic emissions (“grandfathering”). Auctioning is the most transparent method of allocation, putting into practice the principle that the polluter should pay and creating a strong carbon price signal to drive emissions reductions. It also reduces the risk that some entities may gain an unfair (“windfall”) profit from an ETS in which they can charge a higher price for their product without paying for their allowances.<sup>3</sup> Figure 1 depicts key steps in different types of ETSs, both the credit-based system and the allocation-based system, including both free allocation and auctioning. It also shows how the government generates revenue from auctioning of the allowances in the allocation-based system.

**FIGURE 1 KEY STEPS IN DIFFERENT TYPES OF ETS - CREDIT-BASED AND ALLOCATION-BASED SYSTEMS, INCLUDING BOTH FREE ALLOCATION AND AUCTIONING**



3 Windfall profits in the power sector under the EU ETS during its initial phases stemmed primarily from the free allocation of the emissions allowances. Power companies, which received free allowances, were able to incorporate the notional cost of carbon into electricity prices, thereby increasing market prices and realizing significant profits without a corresponding rise in operational costs. This phenomenon was exacerbated by the electricity market structure, where prices were determined by the marginal cost of the last unit of production, typically from fossil fuel plants. The regulatory framework at the time did not adequately anticipate or mitigate these windfall gains. Consequently, subsequent phases of the EU ETS implemented a shift toward auctioning allowances in the power sector to rectify this oversight.

Auctioning increases the effective carbon price that an entity pays for its emissions. The comparison of effective carbon prices under free allocation and auctioning is provided in Table 1.

**TABLE 1 ILLUSTRATION OF EFFECTIVE CARBON PRICE PAID UNDER 100% FREE ALLOCATION AND 75% FREE ALLOCATION (25% AUCTIONING)**

	<b>100% FREE ALLOCATION</b>	<b>75% FREE ALLOCATION, 25% AUCTIONING</b>
<b>Emissions at start of year</b>	110 tonnes CO <sub>2e</sub>	110 tonnes CO <sub>2e</sub>
<b>Emissions target for the current year</b>	100 tonnes CO <sub>2e</sub>	100 tonnes CO <sub>2e</sub>
<b>Allowances freely allocated at the beginning of the compliance period</b>	100 units	75 units; remainder to be bought at government auction or in the secondary market
<b>CASE 1 - ENTITIES EXACTLY REACH THEIR EMISSIONS REDUCTION TARGETS</b>		
<b>Average allowance price</b>	USD 20/tonne CO <sub>2e</sub>	USD 20/tonne CO <sub>2e</sub>
<b>Emissions at year end</b>	100 tonnes CO <sub>2e</sub>	100 tonnes CO <sub>2e</sub>
<b>Total amount paid toward emissions</b>	0 units * USD 20 = USD zero	25 * 20 = USD 500 (revenue to government)
<b>Effective price paid per tonne of CO<sub>2e</sub> emissions</b>	USD zero	USD 500/100 = USD 5
<b>CASE 2 - ENTITIES UNDERACHIEVE THEIR EMISSIONS REDUCTION TARGETS</b>		
<b>Average allowance price</b>	USD 20/tonne CO <sub>2e</sub>	USD 20/tonne CO <sub>2e</sub>
<b>Emissions at year end</b>	120 tonnes CO <sub>2e</sub>	120 tonnes CO <sub>2e</sub>
<b>Total amount paid toward emissions</b>	20 units * USD 20 = USD 400	45 * 20 = USD 900 (revenue to government)
<b>Effective price paid per tonne of CO<sub>2e</sub> emissions</b>	USD 400/120 = USD 3.33	USD 900/120 = USD 7.50
<b>CASE 3 - ENTITIES OVERACHIEVE THEIR EMISSIONS REDUCTION TARGETS</b>		
<b>Average allowance price</b>	USD 20/tonne CO <sub>2e</sub>	USD 20/tonne CO <sub>2e</sub>
<b>Emissions at year end</b>	90 tonnes CO <sub>2e</sub>	90 tonnes CO <sub>2e</sub>
<b>Total amount paid toward emissions</b>	Sell 10 units. Revenue = 10 units * USD 20 = USD 200	15 * 20 = USD 300 (revenue to government)
<b>Effective price paid per tonne of CO<sub>2e</sub> emissions</b>	Generated revenue for entity by selling allowances	USD 300/90 = USD 3.33

However, for entities that are not able to pass through carbon costs to product prices, auctioning could have negative financial impacts, including potential loss of production to overseas competitors (carbon leakage). Free allocation has been widely applied to mitigate this risk for such sectors. Systems gradually seek to reduce the amount of free allocation and increase the share of auctioning in line with tighter emissions targets, to raise increasing amounts of climate finance, and to reduce cost burdens of CBAMs.<sup>4</sup>

<sup>4</sup> Carbon Border Adjustment Mechanisms (CBAMs) are being deployed by jurisdictions with higher carbon prices to counter the risk of carbon leakage. The idea is to charge the importers of goods the same effective carbon price as is charged within the jurisdiction to safeguard the competitiveness of domestic industries. For instance, if the effective carbon price paid by an entity in the EU is USD 50/tonne CO<sub>2e</sub> and the effective carbon price of producing the good in India is USD 10/tonne CO<sub>2e</sub>, the carbon price that the importer of the good into the EU will pay at the EU border is (50 - 10) USD 40/tonne CO<sub>2e</sub>.

For any jurisdiction, whatever initial design is chosen, it is good practice to communicate a long-term vision for an ETS, recognizing that some important elements may not be in place at the start and could take some time to develop. This would help provide greater long-term certainty and predictability to obligated entities and market participants to help their decision-making.

## 2.2 HOW EMISSIONS TRADING SYSTEMS CAN GENERATE REVENUE

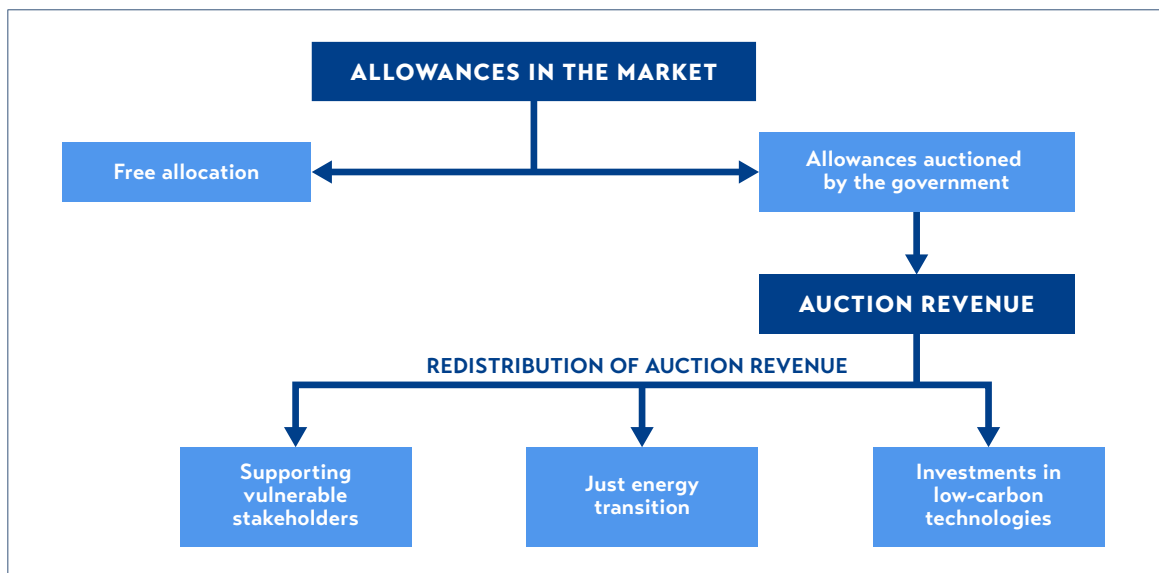
As well as the carbon price driver described above, ETSs can incorporate a second powerful mechanism for reducing emissions: generating revenue for the government that can be used to support investment in decarbonization technologies and for other beneficial uses. Some of the different ways in which an ETS can generate revenue are described below.

### 2.2.1. Allowance allocation by auctioning

The government may assess the potential of sectors to pass through carbon costs to retail prices and the risk of carbon leakage and decide that a certain sector, for example, the power sector, will only get 75% of the allowances aligned with its emissions target for free. The remainder will be held by the government and auctioned in the market. The entities in the power sector can then choose whether they want to buy the allowances from the government auctions or later from other entities in the secondary market. Either way, entities in the power sector are now paying for 25% of their emissions and effectively paying more for their emissions than when all the allowances were distributed for free (Table 1). Unlike free allowance allocation, auctioning allowances could result in substantial revenue generation for the government.

Figure 2 gives an example of how the revenue generated through auctioning could be distributed for different purposes. Each jurisdiction can design the allocation of funds considering its domestic circumstances.

**FIGURE 2 DISTRIBUTION OF EMISSIONS ALLOWANCES AND AUCTION REVENUE IN AN ETS**



Source: Authors' analysis.

### 2.2.2. Funds using allowances set aside under an overall ETS cap

The government can also plan to set aside a certain percentage of allowances under the overall cap for a targeted fund. For instance, under the EU ETS, the Innovation Fund is funded by the monetization of 530 million ETS allowances through auctioning. The size of the Innovation Fund is projected to be EUR 40 billion (USD 43 billion), assuming a EUR 75 per tonne (USD 80) carbon price.

Similarly, the Modernization Fund under the EU ETS is funded by the auctioning of 2.5% of the total quantity of the EU ETS allowances, and other sources.

### 2.2.3. Government sale of credits

The government can also generate revenue by selling credits to the obligated entities. An example of this is the Australian Safeguard Mechanism. Entities that do not achieve their target will have the option to purchase Australian Carbon Credit Units (ACCUs) from the government at a fixed rate of USD 75 in 2023–2024, with an annual increase tied to the consumer price index (CPI) plus 2%. Any revenue acquired through this process would be directed to a fund to help trade-exposed entities<sup>5</sup> invest in low-carbon technologies. This mechanism not only helps control carbon costs and provides certainty to facilities regarding their maximum compliance expenses, it also ensures credits are available to entities that need them. Additionally, penalties levied for non-compliance are also allocated to the fund.

Table 2 summarizes the way selected ETSs globally are generating finance.

**TABLE 2 REVENUE-GENERATION MECHANISMS IN SELECTED GLOBAL ETSs**

EMISSION TRADING SYSTEMS	FINANCE THROUGH AUCTIONING OF EMISSIONS ALLOWANCES	FINANCE BY SETTING ASIDE ALLOWANCES FOR A FUND	SALE OF CREDITS	TOTAL REVENUE GENERATED UNTIL 2023 (IN USD BILLIONS) <sup>6</sup>
EU ETS	✓	✓		206
California Cap-and-Trade Program	✓			28
Washington State Cap-and-Invest Program	✓			2
Regional Greenhouse Gas Initiative (RGGI)	✓	✓		7
Korean ETS	✓			1
Australian Safeguard Mechanism			✓	<1
Japan GX-ETS	✓			Zero so far <sup>7</sup>

<sup>5</sup> Trade exposed entities are entities that are constrained in their ability to pass through carbon costs due to actual or potential international competition.

<sup>6</sup> *Emissions trading worldwide: 2024 ICAP status report* (no date) *International Carbon Action Partnership*. Available at [https://icapcarbonaction.com/system/files/document/240416\\_report\\_final.pdf](https://icapcarbonaction.com/system/files/document/240416_report_final.pdf). (Accessed May 10, 2024)

<sup>7</sup> Auctioning in GX-ETS is scheduled to start by 2033 and is planned to raise approximately USD 120 billion of revenue.

# ETS AUCTION REVENUE AS A SOURCE OF CLIMATE FINANCE—INTERNATIONAL EXAMPLES

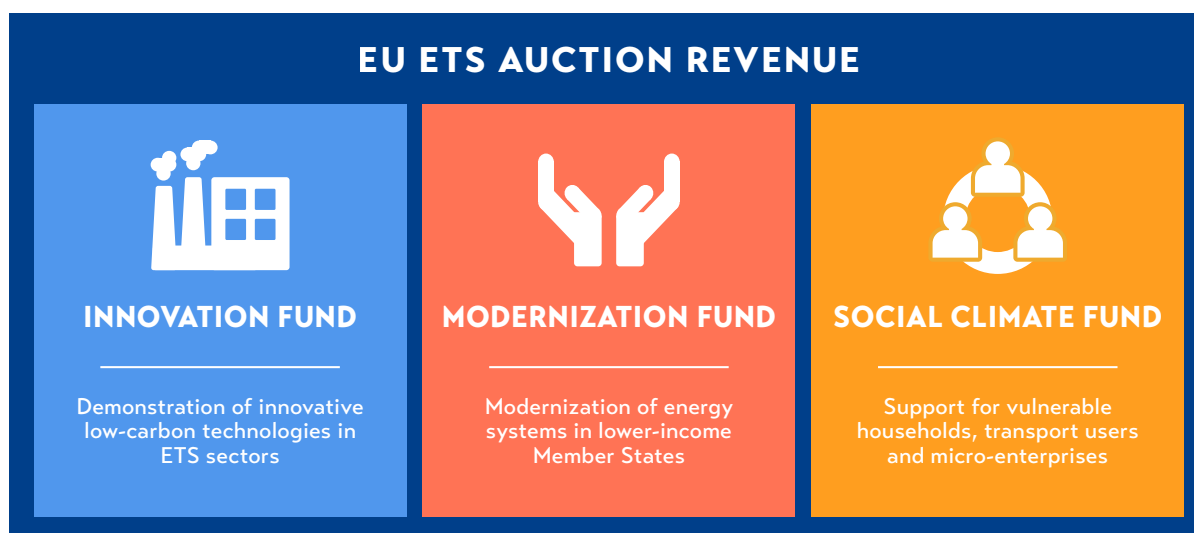
## 3.1 EUROPEAN UNION EMISSIONS TRADING SYSTEM (EU ETS)

The EU ETS stands as a crucial policy in realizing the goals of the European Green Deal, which aims to achieve net zero GHG emissions in the EU by 2050. This ETS covers approximately 40% of the EU's overall emissions, covering various sectors such as electricity generation, industry, and aviation. Since its inception, the EU ETS has played a pivotal role in driving down emissions from energy and industrial facilities by 47% since 2005. Additionally, it has yielded more than EUR 184 billion (USD 206 billion)<sup>6</sup> in auction revenues that have been earmarked to drive further decarbonization efforts.

Part of the auction revenue generated by the EU ETS is distributed among Member States and the other part is divided among the Innovation Fund, Modernization Fund, and Social Climate Fund. Member States are now required to allocate all their revenue from emissions trading under the EU ETS for climate and energy purposes and related social purposes. This represents an increase from the previous requirement up to 2023 for Member States to allocate at least 50% of revenues for these purposes.<sup>8</sup>

The EU's centralized funds support decarbonization of ETS sectors, provide financial assistance for energy transition of lower-income Member States, and provide support to vulnerable stakeholders. Figure 3 shows the centralized EU ETS funds supported by auction revenue, with further details given below.

**FIGURE 3 CENTRALIZED EU ETS FUNDS FOR AUCTION REVENUE EARMARKING**



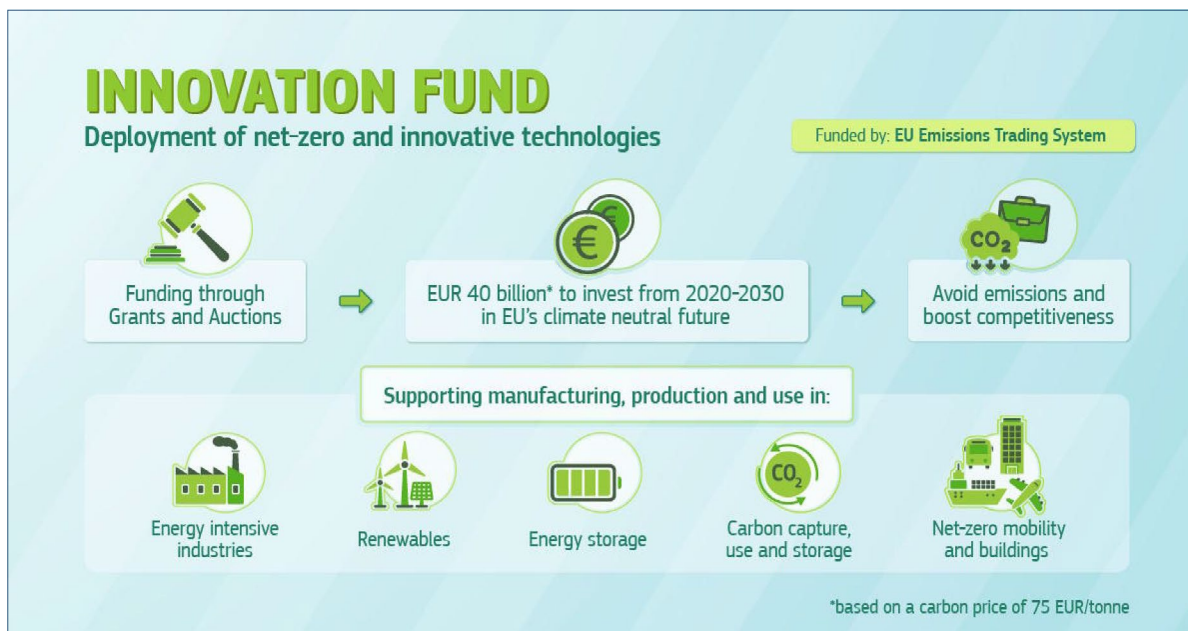
Source: Authors' analysis.

<sup>8</sup> The actual amount of revenue allocated by Member States for climate, renewable energy, and energy efficiency-related purposes significantly exceeded the previous targets, with 76% allocated to these purposes between 2013 and 2022, according to the European Environment Agency.

### 3.1.1 Innovation Fund

The EU Innovation Fund supports the demonstration of innovative low-carbon technologies aimed at reducing carbon emissions in Europe's energy-intensive sectors (Figure 4). With a current projected budget exceeding EUR 40 billion (USD 43 billion), it ranks among the largest grant programs globally and is exclusively financed by the EU ETS.

FIGURE 4 EU INNOVATION FUND



Source: Europa.eu; Innovation Fund Projects (no date) Climate Action. Available at [https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund/innovation-fund-projects\\_en](https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund/innovation-fund-projects_en) (Accessed: April 5, 2024).

The fund is designed to support a diverse range of innovative projects across various technologies and sectors in all eligible regions, including all EU countries, Norway, Liechtenstein, and Iceland. Projects must demonstrate advanced stages of planning and have solid business, financial, and legal frameworks. Funding is awarded through calls for proposals and competitive bidding processes such as auctions.

Projects applying for standard grants will be evaluated on several criteria: their effectiveness in avoiding GHG emissions, the level of innovation they bring, their maturity, their potential for replication, and their cost efficiency.

Projects entering competitive bidding must first meet minimum qualification criteria and are then ranked according to their bid prices. Each call for proposals will specify the detailed scoring and ranking methodologies and may include additional criteria to ensure geographical and sectoral balance.

The Innovation Fund offers support covering up to 60% of relevant costs for regular grants and up to 100% for competitive bidding projects. Grant disbursements are tailored to the financial needs of the projects, taking into account the milestones achieved during their lifecycle. For regular grants, up to 40% of the funding can be allocated based on predefined milestones before the project is fully operational. In contrast, for competitive bidding, payments are made only during the operational period of the projects.

Since 2020, the fund has granted more than EUR 3.1 billion (USD 3.3 billion) to approximately 70 projects across a diverse range of sectors,<sup>9</sup> spanning chemicals, steel, cement, refineries, green hydrogen production, and renewables. In the latest call for large-scale projects under the Innovation Fund, with a budget of EUR 3 billion (USD 3.1 billion), there was a particular focus on hydrogen and electrification, clean-tech manufacturing, and mid-size pilots.

### 3.1.2 Modernization Fund

In addition to promoting innovation-driven transformations within the sectors covered by the EU ETS, the EU also acknowledges the varying starting points of Member States in addressing the challenges of transitioning to green economies. The EU Modernization Fund serves as one of its solidarity mechanisms, aiding lower-income Member States in their efforts to decarbonize and develop sustainable energy systems. Currently, a minimum of 70% of the anticipated budget of this fund, estimated to reach EUR 48 billion (USD 50 billion) by 2030, must be allocated to priority projects facilitating the beneficiary countries' transition toward climate neutrality.

Since 2021, approximately EUR 5 billion (USD 5.3 billion)<sup>6</sup> has been allocated for investments in energy-efficiency enhancements, renewable energy, energy storage, and the modernization of power grids in these beneficiary countries. The approved revision of the EU ETS expands the Modernization Fund's size (to 2.5% of the allowances under the cap) and extends its support to Greece, Portugal, and Slovenia. Moreover, a greater portion of the fund is earmarked for priority investments (up to 90%), and stricter limitations are imposed on funding projects related to fossil fuels.

### 3.1.3 Social Climate Fund

The EU Social Climate Fund is being established in conjunction with the introduction of the new ETS 2, which will cover CO<sub>2</sub> emissions from fuel combustion in buildings, road transport, and small industry. This fund will offer dedicated assistance to Member States aimed at aiding vulnerable individuals and microenterprises in making green investments related to energy efficiency, decarbonization, and sustainable transportation. Examples of eligible investments include home insulation, heat pumps, solar panels, and electric vehicles.

From 2026 to 2032, the Social Climate Fund is anticipated to mobilize at least EUR 87 billion (USD 91 billion) throughout the EU. This funding will be derived from auction revenues from the EU ETS and ETS 2 along with 25% of national contributions. In addition to financing green investments, Member States will have the flexibility to allocate up to 37.5% of the fund's resources toward providing direct income support for vulnerable households and transportation users.

## 3.2 REGIONAL GREENHOUSE GAS INITIATIVE (RGGI)

The Regional Greenhouse Gas Initiative (RGGI) was established in 2009 as the first mandatory GHG emissions trading system in the United States. Initially, it included ten states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont). The "2005 RGGI Memorandum

9 *Innovation Fund Projects* (no date). *Climate Action*. Available at [https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund/innovation-fund-projects\\_en](https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund/innovation-fund-projects_en). (Accessed: April 5, 2024)

of Understanding” (MOU) and the “2006 RGGI Model Rule” guided the development of RGGI. Each participating state then implemented its own CO<sub>2</sub> budget trading program based on these guidelines.

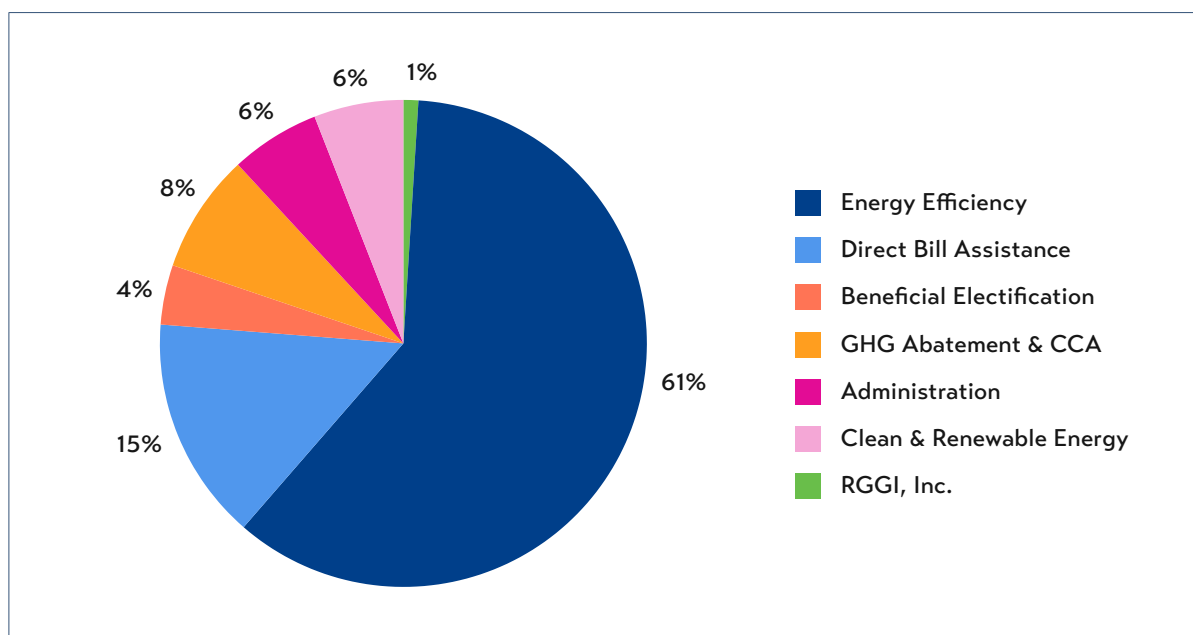
RGGI focuses on regulating emissions from the power sector in the participating states. In 2020, it covered approximately 14% of the total emissions from these states, with 228 facilities falling under its regulations. The overall emissions cap is set to decrease by 30% compared to 2020 levels between 2021 and 2030.

Each state participating in RGGI allocates CO<sub>2</sub> allowances through quarterly auctions. States reserve a portion of these allowances in “set-aside” accounts,<sup>10</sup> distributing them in accordance with their individual regulations.

Since its inception, RGGI has generated USD 7 billion through auctioning of allowances. The revenue from these auctions is returned to the participating states and is primarily used for consumer benefit programs, including initiatives for energy efficiency, direct bill assistance, beneficial electrification, GHG abatement, and clean and renewable energy projects.

A summary of the investments made by proceeds of the revenue collected through auctioning of allowances under RGGI is given in Figure 5, showing each program category as a percentage of all-time RGGI investments. The life-time benefits of revenue earmarking under the RGGI scheme are presented in Table 3.

**FIGURE 5 DISTRIBUTION OF AUCTION REVENUE UNDER RGGI**









Source: RGGI (June, 2024) The investment of RGGI proceeds in 2022. Available at [www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI\\_Proceeds\\_Report\\_2022.pdf](http://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2022.pdf). (Accessed June 10, 2024)

<sup>10</sup> The CO<sub>2</sub> trading programs of RGGI states might incorporate state-specific set-aside programs. These set-aside accounts are part of the broader effort to reduce GHG emissions and support various environmental and economic goals. These programs enable a state to reserve a limited number of CO<sub>2</sub> allowances in set-aside accounts, which can be retired, allocated, or distributed in ways other than through the RGGI auctions. Examples of set-aside accounts include Voluntary Clean Energy Purchase Set-Aside, Customer-side Distributed Resources (CDR) Set-Aside, Combined Heat and Power Useful Thermal Energy Set-Aside, Integrated Manufacturing Facility Pre-Retirement Set-Aside, etc.



**TABLE 3 LIFETIME BENEFITS ACCRUED BY INVESTMENTS DONE THROUGH RGGI AUCTION PROCEEDS**

 PARTICIPATING HOUSEHOLDS	7,947,694
 PARTICIPATING BUSINESSES	374,791
 SHORT TONS CO <sub>2</sub> AVOIDED	60,170,134
 MEGAWATT-HOURS SAVED	94,822,626
 MMBTU SAVED	330,997,102
 ENERGY BILL SAVINGS	\$17,532,362,391

Source: RGGI (June, 2024) The investment of RGGI proceeds in 2022. Available at [www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI\\_Proceeds\\_Report\\_2022.pdf](http://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2022.pdf). (Accessed June 10, 2024)

### 3.3 CALIFORNIA CAP-AND-TRADE PROGRAM

The California Cap-and-Trade Program commenced operations in 2012 when its system for allocation, auction distribution, and trading of compliance instruments was launched. Compliance obligations officially began in January 2013. Encompassing approximately 75% of the state's GHG emissions, the program oversees around 400 facilities across various sectors including power, industry, transport, and buildings.

Allowances within the program are distributed through a mix of auctioning, free allocation, and free allocation with consignment auctioning<sup>11</sup>. Revenue generated from auctions is reinvested into projects aimed at emissions reduction, public health, and environmental sustainability, with a particular focus on disadvantaged communities.

In 2022, approximately 65% of total allowances were made available through auctions, which included allowances held by California Air Resources Board (CARB, around 38%) and those consigned to auction by utilities (about 27%). Since its inception, the California Cap-and-Trade program has generated USD 28 billion<sup>12</sup> in revenue.

The majority of California's revenue is allocated to the Greenhouse Gas Reduction Fund, with a minimum of 35% earmarked to benefit disadvantaged and low-income communities. These funds are subsequently allocated as California Climate Investments, supporting projects that yield substantial environmental, economic, and public health advantages statewide. By November 2023, a total of USD 11 billion had been invested in 578,500 projects, estimated

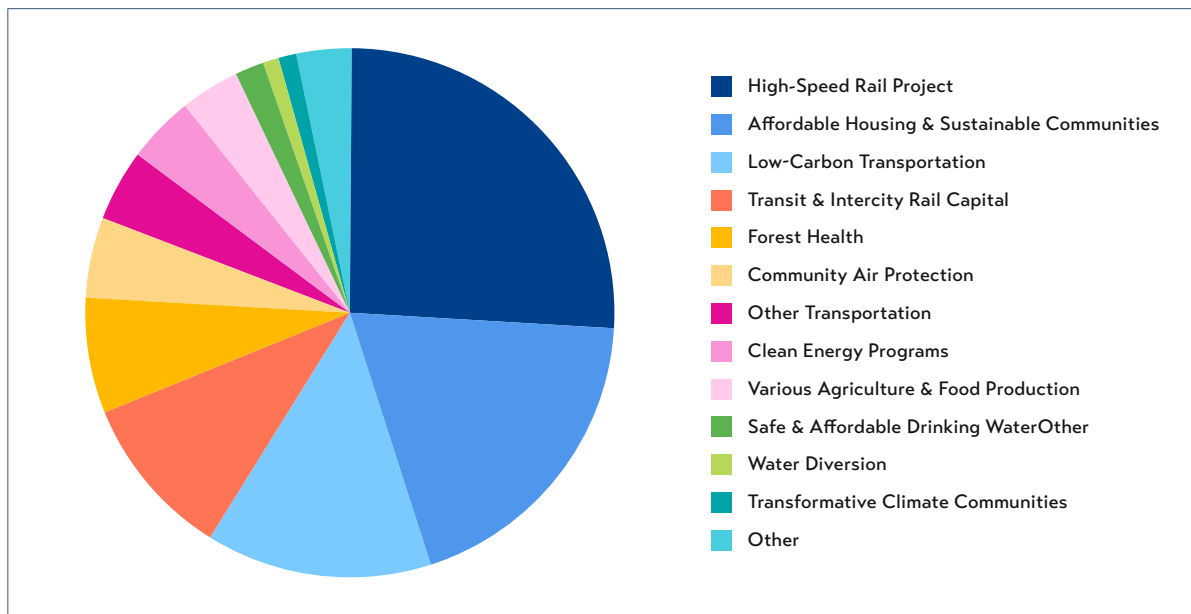
<sup>11</sup> Consignment auctioning is applied to electrical distribution utilities and natural gas suppliers. Allowances are allocated freely to them but they must be consigned to auction, with the proceeds used for ratepayer benefit.

<sup>12</sup> 2024 Annual Report on Cap-and-Trade Auction Proceeds (May, 2024). Available at [https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/cci\\_annual\\_report\\_2024.pdf](https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/cci_annual_report_2024.pdf). (Accessed June 10, 2024)

to result in a reduction of 109 million tonnes of CO<sub>2</sub> equivalent emissions. Notably, USD 8.1 billion (approx. 76%) has been directed toward disadvantaged and low-income communities.<sup>13</sup>

Figure 6 provides a summary of the distribution of California's Cap-and-Trade revenue expenditure.<sup>14</sup>

**FIGURE 6 DISTRIBUTION OF AUCTION REVENUE UNDER CALIFORNIA'S CAP-AND-TRADE PROGRAM**



Source: California's Cap-and-Trade Program: Frequently asked questions (2023). Available at: <https://lao.ca.gov/Publications/Report/4811>. (Accessed April 5, 2024)

California's Cap-and-Trade Program invests heavily in sustainable mobility and supporting vulnerable households. The biggest share of the auction revenue, 34%, goes toward a high-speed rail development project and 27% goes toward affordable housing and sustainable communities.

### 3.4 WASHINGTON STATE CAP-AND-INVEST PROGRAM

Washington's Cap-and-Invest Program began operations in January 2023. It covers approximately 70% of the state's emissions and aligns with the trajectory required to achieve the long-term goal of reducing statewide emissions to 95% below 1990 levels by 2050.

The quarterly auctions integral to Washington's Cap-and-Invest program generate significant revenue, which, according to legislation, must be allocated toward essential climate projects statewide. In its first year, cap-and-invest auctions raised USD 1.8 billion.<sup>15</sup> These proceeds are designed to be allocated into the following accounts:

13 2024 Annual Report on Cap-and-Trade Auction Proceeds (May, 2024). Available at [https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/cci\\_annual\\_report\\_2024.pdf](https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/cci_annual_report_2024.pdf). (Accessed June 10, 2024)

14 California's cap-and-trade program: Frequently asked questions (2023). Available at <https://lao.ca.gov/Publications/Report/4811>. (Accessed April 5, 2024)

15 Cap-and-invest auction proceeds (No date) Auction proceeds—Washington State Department of Ecology. Available at <https://ecology.wa.gov/air-climate/climate-commitment-act/auction-proceeds>. (Accessed April 5, 2024)

1. **Carbon Emissions Reduction Account (CERA)**—This account provides funds for a Climate Active Transportation Account and a Climate Transit Plans Account with an objective of prioritizing the reduction of transportation emissions, including strategies aimed at decreasing reliance on single occupancy passenger vehicles and emissions reduction programs targeting freight, ferries, and ports. These measures collectively form part of a comprehensive approach to address transportation-related emissions and promote sustainable mobility solutions.
2. **Climate Investment Account (CIA)**—The funds derived from auctions and deposited into the CIA are initially allocated to cover the administration expenses of the Cap-and-Invest Program, which are capped at 5% of the total auction revenue. The remaining proceeds are directed toward subaccounts dedicated to financing projects to enhance climate resilience within communities and ecosystems across Washington.
3. **Funding Environmental Justice**—At least 35%, with an objective of 40%, of revenue generated from auctions is to be allocated to projects offering direct advantages to vulnerable populations residing in overburdened communities. Additionally, 10% of auction funds are designated for projects benefiting tribal entities.

### 3.5 SOUTH KOREA—K-ETS

The Korean Emissions Trading System (K-ETS) was introduced in 2015 as the first nationwide ETS in East Asia. Encompassing approximately 74% of South Korea's national GHG emissions, it aligns with the country's goal of achieving carbon neutrality by 2050, as outlined in the Carbon Neutral Framework Act of 2021, and is a core policy to help Korea achieve its 2030 NDC.

In Phase 3 of K-ETS (2021–2025), 10% of the allocation is reserved for auctioning to entities in specified sub-sectors.<sup>16</sup> The government plans to raise the proportion of auctioned allowances in Phase 4 (2026–2030).

The revenue generated from auctions is directed into a climate response fund, which includes assistance for mitigation equipment, fostering low-carbon innovation, and supporting technology development specifically tailored for small- and mid-sized companies encompassed by the K-ETS.

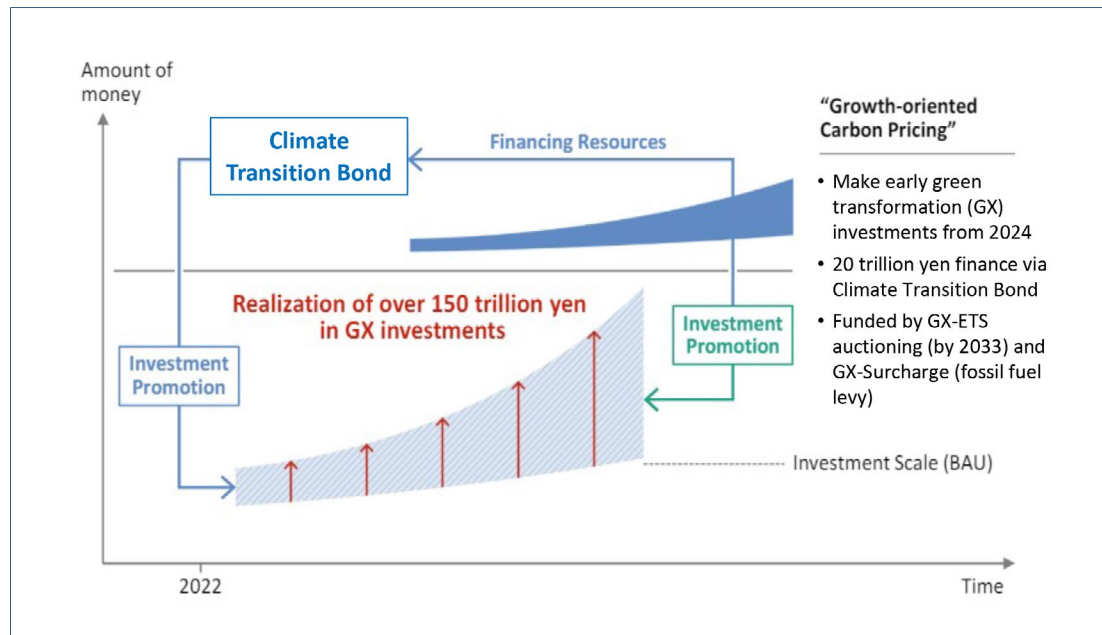
### 3.6 JAPAN'S GX-ETS

In April 2023, Japan introduced its national ETS (GX-ETS) on a voluntary basis, starting with a credit-based design. Currently, approximately 750 companies, accounting for more than 50% of the nation's overall emissions, are engaged in the program. By 2033, proceeds from the auctioning of emissions allowances for power generators will be utilized to reimburse Climate Transition Bonds. These bonds, issued from February 2024 and over the next decade, are worth 20 trillion yen (approximately USD 120 billion) and will facilitate upfront investments in green transition of Japan's power and industrial sectors. The overall aim to realize more than 150 trillion yen (approximately USD 900 billion) of public and private sector investment in low-carbon technologies.<sup>17</sup> A levy on fossil fuel imports, scheduled to begin in 2028, will also contribute to reimbursing the bonds. Japan's example shows the potential to make funds available in the present, even if auctioning in the ETS is scheduled to start at a later date. Figure 7 outlines Japan's Climate Transition Bond Framework.

<sup>16</sup> There are 41 sub-sectors, excluding energy-intensive and trade-exposed (EITE) sub-sectors.

<sup>17</sup> *Japan Climate Transition Bond Framework*. Available at [https://www.mof.go.jp/english/policy/jgbs/topics/JapanClimateTransitionBonds/climate\\_transition\\_bond\\_framework\\_eng.pdf](https://www.mof.go.jp/english/policy/jgbs/topics/JapanClimateTransitionBonds/climate_transition_bond_framework_eng.pdf). (Accessed May 10, 2024)

FIGURE 7 JAPAN'S CLIMATE TRANSITION BOND FRAMEWORK



Source: Japan Climate Transition Bond Framework and author's analysis.<sup>17</sup>

A significant portion of the bond's proceeds<sup>18</sup> 55.5%, is directed toward research and development of technologies that align with emissions reduction targets and support for industrial and energy transition efforts. Within this portion, substantial funding is to be allocated to utilizing hydrogen in steel-making processes and achieving decarbonization in thermal processes. The remaining 44.5% of the bond's proceeds are allocated to subsidy programs aimed at advancing decarbonization objectives. The majority of these subsidies (81.6%) are targeted toward semi-conductors, electricity storage batteries, and energy-efficiency measures in buildings.

18 *Japan's Climate Transition Bond* (No date). Available at <https://www.climatebonds.net/files/reports/japan-transition-bond-briefing-note-14022024.pdf>. (Accessed April 5, 2024)

# HOW CAN INDIA UNLOCK THE POTENTIAL OF AN EFFECTIVE CCTS?

India's CCTS could generate substantial revenue if it allows auctioning of allowances,<sup>19</sup> in line with leading ETSs globally.<sup>20</sup> For India's power sector, auctioning could potentially generate **USD 700 billion to USD 1400 billion by 2050** under certain policy assumptions<sup>21</sup> and depending on the amount of coal-fired power generation in India over this time period.<sup>22</sup>

India has a unique opportunity to learn from the strengths and weaknesses of existing international ETSs to design a CCTS that best suits its domestic circumstances and helps the government raise revenue through auctioning. This revenue could help India maintain industrial competitiveness and achieve a just transition.

Auctioning within the ETS is most beneficial for achieving climate and social goals when the revenue collected through auctioning is earmarked for climate and energy-related projects aimed at just transition and decarbonization of industrial and power sectors. Policymakers will need to ensure the four pillars shown in Figure 8 are in place for the successful implementation of auctioning in the CCTS, as explained below.

**FIGURE 8 FOUR PILLARS OF EFFECTIVE IMPLEMENTATION OF AUCTIONING IN THE CCTS**



Source: Authors' analysis.

19 A relevant example is Japan's GX-ETS, which is starting as a credit-based system and is expected to transition to an allocation-based system to enable the auctioning of allowances for the power sector by 2033.

20 Including ETSs in EU, UK, the United States (California, Washington State, RGGI), Canada, China, South Korea, Indonesia, etc.

21 For these illustrative ballpark estimates, auctioning for the power sector is assumed to be introduced by 2035, at an initial rate of 25%, increasing to 100% over a 10-year period, with carbon prices assumed to be USD 20/t from 2035, USD 30/t from 2040, and USD 50/t from 2050.

22 This is considering a range of annual growth rates in power sector CO<sub>2</sub> emissions between 4% and 8% until 2044 and a similar decrease after then to reach net zero by 2070, and taking into account current emissions data from the Central Electricity Authority.

## 4.1 ENSURING A CONDUCTIVE POWER MARKET ECOSYSTEM TO ALLOW CARBON COST PASS-THROUGH

A key factor determining the feasibility for auctioning allowances in a sector is the extent to which the sector can pass-through carbon costs to product prices. In ETSs globally, the power sector is the key sector in which the pass-through of carbon costs is most feasible and it is the sector where auctioning of allowances is most widely applied. This is also one of the most important sectors to cover in any ETS due to the scale and cost-effective abatement potential of GHG emissions.

An effective interaction between the CCTS and the power market will be essential. It will be important to identify actions to ensure this effective interaction, including:

- enabling reflection of carbon costs in power station dispatch decisions (driving fuel switching to lower-carbon fuels and renewables);
- enabling pass-through of carbon costs to retail electricity prices (facilitating demand side management of electricity consumption and auctioning for the power sector); and
- the development of a roadmap and action plan to implement effective power market interactions.

In conjunction, measures may be needed to mitigate the impacts of potentially higher electricity costs on vulnerable stakeholder groups, which can be financed by auction revenue.

There are also wider benefits of allowing pass-through of power sector costs to electricity consumers. The power market in India is currently highly subsidized and regulated. Subsidies for the power sector and losses in public sector distribution companies (DISCOMS) are significant. DISCOMS are not able to invest in maintenance projects that could subsequently result in a reduction of transmission and distribution (T&D) losses, nor are they able to invest in building further distribution lines connecting more households and communities to the grid or pay the power generation companies on time. Additionally, the costs of these inefficiencies deplete the money available for other development projects. Therefore, an effective mechanism to pass-through the power sector's costs to consumers would ease financial pressure on the DISCOMS, reduce subsidies, improve system efficiency, and increase electricity access and availability.

## 4.2 ENSURING CCTS DESIGN BEST SUITED FOR AUCTIONING

As mentioned in Section 2.1, the proposed design of the CCTS is a credit-based ETS. There are examples of revenue generation through such a system, including with the Australian Safeguard Mechanism. However, the most significant and proven way of generating revenue from an ETS is through auctioning of allowances as part of allocation-based systems, as illustrated in the examples in Section 3. Furthermore, Japan's GX-ETS, while starting as a credit-based system, is expected to transition to an allocation-based system to enable the auctioning of allowances for the power sector. As such, this is a particularly relevant example for India's consideration, and it is notably beneficial that finance (through Climate Transition Bonds) is being made available much earlier than the start of auctioning, and even before the detailed aspects of the auction design are considered.

The potential transition of the CCTS to an allowance-based system to enable auctioning could be one of a number of areas where the design of the system could evolve over time. Future design options of the CCTS related to target / cap-setting and allocation can be assessed through detailed economic, energy and GHG emission modelling. This can inform the development of a long-term plan for the compliance mechanism over at least the first decade, taking into account these and other important elements of an effective design that may not be in place in the first phase and may take some time to develop. Such a plan would provide considerable benefits, including providing greater long-term certainty and predictability to obligated entities to help them make effective investment decisions for reducing GHG emissions.

### 4.3 EFFECTIVE REVENUE-EARMARKING STRATEGY

For an effective introduction of auctioning, the government needs to carefully chart India's revenue-earmarking strategy, considering domestic circumstances and needs. Policymakers should consider the following when creating this strategy:

1. **Long-term domestic decarbonization goals**—This includes analyzing the decarbonization goals in different sectors, identifying potential roadblocks, and funneling investments accordingly. The government should identify technologies that will need additional financial support to achieve the clean energy and net zero targets, beyond those technologies that would already be commercially viable under existing policies.
2. **Mapping the vulnerable stakeholder groups**—A comprehensive exercise is needed to map the vulnerable stakeholder groups that will be affected by the clean energy and net zero transition. These include the industry stakeholders as well as communities dependent on the fossil economy.
3. **Mapping the division of funds among stakeholder groups**—Mapping the division of funds among different stakeholder groups and purposes should depend on domestic circumstances and needs. The division needs to identify the amount of burden that each stakeholder group will share and, therefore, what proportion of the funds should be allocated to the particular group. Not only should the government allocate sufficient funds to support CCTS entities toward achieving their emissions reduction targets and support just transition of affected stakeholder groups, but also it should safeguard vulnerable groups against potential rises in energy costs. These factors need to be mapped for the Indian context while designing the auction revenue-earmarking strategy.
4. **Identifying the financial instruments best suited for India**—Various types of financial instruments are currently being used internationally; some have been described in earlier sections. Further best practice assessments should be conducted for financial instruments most useful to India. Similarly, for just transition, an analysis needs to be done to understand the most effective ways of disbursing funds to the beneficiaries. While investment is needed to diversify employment opportunities, such as creating training and livelihood centers and other relevant infrastructure, there is also a need to create a financial safety net for people dependent on the coal economy. The funds could be disbursed using direct cash transfer or a dedicated employee transition fund managed by their employer or entity. The effectiveness of these approaches in the Indian context must be studied before devising specific financial instruments for industrial decarbonization and just transition.

#### 4.4 ESTABLISHING A ROBUST GOVERNANCE STRUCTURE FOR AUCTION REVENUE

India has struggled to effectively use the funds collected through initiatives such as District Mineral Funds (DMF) and introduction of the coal cess. A robust governance structure for the funds collected through auctioning in the CCTS will help to ensure that funds are used for their intended purpose, with considerable scope for learning from international experience and best practices in India. The use of the funds could be guided by laws and institutions designed to ensure a just energy transition.

Additionally, as India has a federal governance structure, the governance structure of the just transition fund needs to be designed accordingly. For example, India can consider the governance structure of funds financed by auction revenue from the EU ETS, including both centrally managed funds and those managed by the Member States. Similarly, in India, since the CCTS is a central government-led policy, the central government would collect the auction revenue, which could then be divided into separate funds. The design and implementation of each of these funds need to be studied, and a governance structure must be in place to deploy the funds effectively. For instance, a fund supporting just transition may be most effective if it were allotted to state governments to address state- and local-level priorities, with a mandate and guidelines to deploy it in the coal-affected districts. Conversely, a decarbonization fund envisaged for industrial and power sectors may be more effective if it were handled by a central government department to ensure strategic apportionment in line with national priorities and recognizing that many affected entities will have operations across multiple states.



# CONCLUSION

The adoption of emissions trading systems (ETs) has emerged as a pivotal strategy for climate mitigation across various global jurisdictions. These systems are intricately tailored to suit domestic contexts and specific circumstances, showcasing their adaptability and effectiveness. Moreover, ETs are increasingly recognized as vital instruments for generating substantial domestic climate finance.

India's ongoing endeavor to develop its own CCTS presents an exceptional opportunity to glean insights from established ET models and create a CCTS uniquely suited to India's needs. This strategic approach not only aligns with achievement of India's Nationally Determined Contributions (NDCs) but also positions the country to harness significant domestic climate finance. By leveraging the lessons learned and best practices from existing ET frameworks, India can facilitate a just energy transition while advancing its climate goals.

To learn more, visit: [AsiaSociety.org/financing-just-transition](https://AsiaSociety.org/financing-just-transition)



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