



CCTS: Accelerating the path to decarbonization

Strategy realised

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Executive summary

The initial CCTS targets are foundational, signaling the importance of proactive decarbonization by industry



Market-based emission reduction scheme

India's Carbon Credit Trading Scheme (CCTS) is a market-based emission scheme that incentivizes emission reductions and operates through a two-tiered approach:

- Mandatory compliance mechanisms (which include mandatory targets for designated sectors)
- A voluntary offset mechanism (which enables emitters to buy credits to balance their emissions voluntarily)

Designated sectors: Cement, aluminum, chlor-alkali, paper and pulp, iron and steel, refineries, textiles, petrochemicals, fertilizers



Initial targets are modest but foundational

For the compliance period 2025-2027, the overall greenhouse gas emissions intensity (GEI) reduction targets are as follows:

- Cement: 2% to 6%
- Aluminum: 4% to 7%
- Chlor-Alkali: 6% to 9%
- Paper and pulp: 4% to 9%
- Iron and steel: 4% to 6%
- Refineries: 2% to 6%
- Textiles: 4% to 12%
- Petrochemicals: 5%



Initially modest, the financial burden of the CCTS could escalate sharply, affecting company revenues in the long run

Due to forthcoming technological advancements, the expenses associated with decarbonization initiatives are expected to decrease; however, the carbon prices* required to comply with the CCTS are anticipated to rise significantly in the near future.



Early compliance is essential

Early decarbonization under the CCTS provides benefits, including improved energy and operational efficiency, resulting in cost savings, besides mitigating the risk of escalating penalties.

Cost-intensive initiatives such as carbon capture, green fuels and low-carbon technological shifts will be necessary to meet stringent CCTS benchmarks in the future and to achieve net zero goals for companies.

With industry emissions trailing Science Based Target Initiatives (SBTi) and net zero benchmark trajectories, CCTS regulations are likely to tighten, underscoring the need for immediate decarbonization action.

*Carbon prices refer to cost of purchasing certificates/carbon credits

Source: EY-Parthenon Analysis

Strategic decarbonization pathways for India's cement sector: Carbon capture and energy efficiency measures are the primary levers for emission reduction and financial optimization



1 Market and capacity dynamics

- Moderate growth in cement production
 - Cement production in India has grown from 337 MMT (million metric ton) in 2019 to 433 MMT in 2024, with a CAGR of 3.8%.
- Despite this, capacity utilization has remained flat at 65%-69%, indicating structural inefficiencies or overcapacity.



2 Regulatory and financial implications

- Emerging compliance risks
 - A prominent company faces a potential emission gap of up to 82% by 2040 when benchmarked against Accelerated Decarbonization and SBTi targets.
- Financial exposure to carbon penalties
 - Non-alignment with decarbonization pathways could result in INR314-320 crore under CCTS penalties for the company by 2030.



3 Strategic technology and investment levers

- Decarbonization as a Strategic Differentiator
 - Early adopters of technologies like RE, CCUS can position themselves as climate leaders
- Cost Mitigation through Energy Efficiency
 - Energy efficiency remains a cost-saving lever while supporting emissions reduction goals



4 Future cost of inaction

- Declining cost of abatement
 - By abating emissions at a cost lower than the carbon price, the cement industry may realize significant cost savings between 2032 and 2035, by overcoming the higher costs tied to carbon prices.
- Carbon prices are expected to become more expensive, making internal decarbonization efforts more economically viable in the long term.

Recommendations



1 Accelerate transition plans

Companies should align with SBTi or accelerated decarbonization pathways to avoid future liabilities and capitalize on ESG opportunities.



2 Invest in key levers

Prioritize carbon capture technologies, which contribute to more than 50% CO2 abatement, and adopt energy efficiency measures as complementary strategies for emission reduction and financial optimization.

Source: EY-Parthenon Analysis

Strategic decarbonization pathways for India's aluminum sector: Renewable energy and carbon capture measures are the primary levers for achieving more than 70% CO₂ abatement

1

Market and capacity dynamics

- Moderate growth in aluminum production
 - India's primary aluminum production has seen moderate growth, increasing from 3.6 MMT to 4.2 MMT, reflecting a CAGR of 5.3%.
- Exports to the EU have fallen from 30% in 2023 to 17% in 2024, indicating the effects of carbon pricing under the CBAM.

2

Regulatory and Financial Implications

- Emerging compliance risks
 - An Indian conglomerate would have an emission differential of 10% by 2030 if compared with CCTS targets.
- Financial exposure to carbon penalties
 - Non-alignment with decarbonization pathways could result in ~INR1179-1185 crore under CCTS penalties for the company by 2030

3

Strategic technology and Investment levers

- Decarbonization as a strategic differentiator
 - Early adopters of technologies like RE and alternate fuels can position themselves as climate leaders.
 - Energy efficiency measures like waste heat recovery, alumina efficiency are cost-saving measures along with emission reduction strategies.

4

Future cost of inaction

- Declining cost of abatement
 - By abating emissions at a cost lower than the carbon price, the aluminum industry may realize significant cost savings between 2037 and 2040 by overcoming the higher costs tied to carbon prices.
 - Carbon prices are expected to become more expensive, making internal decarbonization efforts more economically viable in the long term.

Recommendations

1

Accelerate transition plans to avoid CBAM and CCTS impact

Compliance with SBTi and accelerated decarbonization are essential, as the financial impact of the CBAM on India's aluminum sector is anticipated to be significant.

2

Invest in key levers

Prioritize renewable energy and carbon capture technologies as dual strategies for emission reduction, targeting by ~53% and ~21% in primary aluminum.

Strategic decarbonization pathways for India's chlor-alkali sector: Renewable energy and energy efficiency measures are the primary levers for achieving up to 60% CO₂ abatement

1

Market and capacity dynamics

- Moderate growth in caustic soda production
 - India's caustic soda production has seen moderate growth, increasing from 3.5 MMT to 4.6 MMT, reflecting a CAGR of 6.2% and at a capacity utilization of ~80%.
 - The production of chlorine during 2023-24 was 40.87 lakh MMT, compared to 39.63 lakh MMT in 2022-23, an increase of 3.1%.
 - Exports of caustic soda reached 465 KT in 2023-24, while imports have significantly decreased over the years, totaling 221 KT.

2

Regulatory and Financial Implications

- Emerging compliance risks
 - An Indian chemical manufacturing company would have an emission differential of 58% by 2030 and 93% by 2040 if compared with accelerated decarbonization targets.
- Financial exposure to carbon penalties
 - Non-alignment with decarbonization pathways could result in INR94-100 crore under CCTS penalties for the company by 2030.

3

Strategic technology and investment levers

- Decarbonization as a strategic differentiator
 - Early adopters of technologies like RE and carbon capture can position themselves as climate leaders.
 - Intervention across digital transformation and energy efficiency measures like brine temperature control and MVR has the potential to reduce emissions and provide cost benefits.

4

Future cost of inaction

- Declining cost of abatement
 - By abating emissions at a cost lower than the carbon price, chlor-alkali sector may realize significant cost savings between 2030 and 2032 by overcoming the higher costs tied to carbon prices.
 - Carbon prices are expected to become more expensive, making internal decarbonization efforts more economically viable in the long term.

Recommendations

1

Accelerate transition plans to avoid CBAM and CCTS impact

Compliance with SBTi and accelerated decarbonization are essential, as the cost of abatement is projected to drop below the Indian carbon prices in the next five years.

2

Invest in key levers

Prioritize RE to abate half of the total emissions. Also, focus on energy efficiency measures to reduce emissions by a further 15% to 18%, resulting in cost savings.

Source: EY-Parthenon Analysis

Strategic decarbonization pathways for India's paper and pulp sector: Utilization of biomass for steam production, along with carbon capture measures, is essential for emission reduction

1 Market and capacity dynamics

- Moderate growth in the paper industry
 - India's paper production has seen moderate growth, increasing from 18.9 MMT to 23.8 MMT, reflecting a CAGR of 5.8% and utilization of 88%.
 - Export of paper, paperboard and newsprint have increased almost three times.

2 Regulatory and financial implications

- Emerging compliance risks
 - Diversified Indian conglomerate would have an emission differential of 66% by 2030 and 96% by 2040 if compared with accelerated decarbonization targets.
- Financial exposure to carbon penalties
 - Non-alignment with decarbonization pathways could result in ~INR23-29 crore under CCTS penalties for the company by 2030.

3 Strategic technology and investment levers

- Decarbonization as a strategic differentiator
 - Early adopters of technologies such as RE and alternate fuels can position themselves as climate leaders.
 - Interventions like pumping optimization, efficient rotors, heat recovery and turbo fans are crucial to abate emissions and lead to cost benefits.

4 Future cost of inaction

- Declining cost of abatement
 - By abating emissions at a cost lower than the carbon price, paper and pulp industry may realize significant cost savings between 2029 and 2031 by overcoming the higher costs tied to carbon prices.
 - Carbon prices are expected to become more expensive, making internal decarbonization efforts more economically viable in the long term.

Recommendations

1 Accelerate transition plans to avoid CCTS impact

Compliance with SBTi and accelerated decarbonization are essential, as the cost of abatement is projected to drop below the Indian carbon prices in next four to five years.

2 Invest in key levers

Prioritize usage of biomass for steam production. Further, as the cost of technology reduces, P&P industry can leverage carbon capture to curb emissions.

Strategic decarbonization pathways for India's iron and steel sector: Utilization of GH2 in BF, RE, and carbon capture measures are essential for emission reduction in BF-BOF steelmaking

1

Market and capacity dynamics

- Tremendous growth in the iron and steel industry
- India's crude steel production has seen steady growth, increasing from 109 MMT in FY20 to 144 MMT in FY24, reflecting a CAGR of 5.72%.
- Globally, India is the second-largest producer of steel and is on the path to achieving of 300 MMT installed capacity, with 255 MMT expected by FY31.

2

Regulatory and financial implications

- Emerging Compliance Risks
 - Diversified Indian conglomerate with would have an emission differential of 67% by 2030 and 96% by 2040 if compared with accelerated decarbonization targets.
- Financial exposure to carbon penalties
 - Non-alignment with decarbonization pathways could result in ~INR3,010-3,016 crore under CCTS penalties for the company by 2030.

3

Strategic Technology and Investment Levers

- Decarbonization as a strategic differentiator
 - Early adopters of technologies like RE, carbon capture, and GH2 injection in BF can position themselves as climate leaders.
 - In the short term, BF-BOF players may focus on energy efficiency principles like energy monitoring, variable speed drives, heat recovery systems etc. to abate emissions, leading to cost saving.

4

Future Cost of Inaction

- Declining cost of abatement
 - By abating emissions at a cost lower than the carbon price, iron and steel industry may realize significant cost savings between 2035 and 2039 by overcoming the higher costs tied to carbon prices.
 - Carbon prices are expected to become more expensive, making internal decarbonization efforts more economically viable in the long term.

Recommendations

1

Accelerate transition plans to avoid CBAM and CCTS impact

Compliance with SBTi and accelerated decarbonization are essential, as the financial impact of the CBAM on India's iron and steel sector is anticipated to be significant.

2

Invest in key levers

Prioritize energy efficiency measures. Further, as the cost of technology reduces, iron and steel industry can leverage carbon capture to curb emissions .

Source: EY-Parthenon Analysis

Strategic decarbonization pathways for India's refinery sector: Electrification, alternate fuels and carbon capture measures are essential for emission reduction in refineries

1

Market and capacity dynamics

- Considerable growth in the refinery sector
 - India's refinery installed capacity has seen sharp growth, increasing from 215 MMT in FY14 to 257 MMT in FY24, reflecting a growth of 19.5%.
 - As of date, India has 23 refineries and is ranked fourth in terms of installed refining capacity globally.

2

Regulatory and financial implications

- Emerging compliance risks
 - Diversified Indian conglomerate would have an emission differential of 58% by 2030 and 93% by 2040 if compared with accelerated decarbonization targets.
- Financial exposure to carbon penalties
 - Non-alignment with decarbonization pathways could result in ~INR272-278 crore under CCTS penalties for the company by 2030.

3

Strategic technology and investment levers

- Decarbonization as a strategic differentiator
 - Early adopters of technologies like carbon capture and electrification can position themselves as climate leaders.
 - Adapting "in the money" initiatives like heat recovery, Organic Rankine cycle and RE integration leads to emission intensity reduction and cost savings.

4

Future cost of inaction

- Declining cost of abatement
 - By abating emissions at a cost lower than the carbon price, Indian refineries may realize significant cost savings between 2029 and 2033 by overcoming the higher costs tied to carbon prices.
 - Carbon prices are expected to become more expensive, making internal decarbonization efforts more economically viable in the long term.

Recommendations

1

Accelerate transition plans to avoid CCTS impact

Compliance with CCTS targets and adopting accelerated decarbonization is crucial to mitigate the financial impact of the CCTS on India's refinery sector.

2

Invest in key levers

Prioritize RE and energy efficiency measures. Further, as the cost of technology reduces, refineries can leverage carbon capture to curb emissions.

Strategic decarbonization pathways for India's textiles sector: Adoption of renewable power and biomass usage are the most crucial levers for emissions reduction in the textiles industry

1

Market and capacity dynamics

- Sharp growth in the textile sector
 - India currently has more than 3,400 textile mills installed, with domestic textile and apparel production valued around US\$176 billion
 - The market for Indian textiles and apparel is projected to grow at a 10% CAGR to reach US\$350 billion by 2030

2

Regulatory and Financial Implications

- Emerging compliance risks
 - Diversified Indian conglomerate would have an emission differential of 67% by 2030 and 96% by 2040 if compared with accelerated decarbonization targets
- Financial exposure to carbon penalties
 - Non-alignment with decarbonization pathways could result in ~INR53-59 crore under CCTS penalties for the company by 2030.

3

Strategic Technology and Investment Levers

- Decarbonization as a Strategic Differentiator
 - RE adaption is a cost saving measure in the textile industry
 - Alternate fuels like biomass usage in CPP is also a cost saving initiative leading to emissions reduction

4

Future Cost of Inaction

- Declining cost of abatement
 - By abating emissions at a cost lower than the carbon price, textile industry may realize significant cost savings by overcoming the higher costs tied to carbon prices
 - Carbon prices are expected to become more expensive, making internal decarbonization efforts more economically viable in the long term

Recommendations

1

Accelerate transition plans to avoid CCTS impact

Compliance with SBTi and accelerated decarbonization are essential, as the financial impact of the CCTS on India's textiles sector is anticipated to be significant.

2

Invest in key levers

Prioritize RE and biomass usage. Further, as the cost of technology reduces, textile industries can leverage BESS to curb emissions.

Source: EY-Parthenon Analysis

Strategic decarbonization pathways for India's petrochemical sector: RE adoption and carbon capture measures are essential for achieving meaningful emission reduction

1

Market and capacity dynamics

- Tremendous growth prospects
 - India's petrochemical production capacity is projected to increase from 29.6 MMTPA in 2024 to 46 MMTPA by 2030, reflecting a 55.4% growth.
 - India ranks sixth globally in chemical and petrochemical production.

2

Regulatory and financial implications

- Emerging compliance risks
 - Diversified Indian would have an emission differential of 58% by 2030 and 93% by 2040 if compared with accelerated decarbonization targets.
- **Financial exposure to carbon penalties**
 - Non-alignment with decarbonization pathways could result in ~INR107-113 crore under CCTS penalties for the company by 2030.

3

Strategic technology and investment levers

- Decarbonization as a Strategic Differentiator
 - Early adopters of technologies like alternate fuels, carbon capture can position themselves as climate leaders
 - Energy efficiency and RE integration are the low hanging fruits serving dual benefits: emissions reduction and cost savings

4

Future cost of inaction

- Declining cost of abatement
 - By abating emissions at a cost lower than the carbon price, petrochemicals may realize significant cost savings between 2034 and 2039 by overcoming the higher costs tied to carbon prices.
 - Carbon prices are expected to become more expensive, making internal decarbonization efforts more economically viable in the long term.

Recommendations

1

Accelerate transition plans to avoid CCTS impact

Compliance with CCTS targets and adopting accelerated decarbonization is crucial to mitigate the financial impact of the CCTS on India's petrochemical sector.

2

Invest in Key Levers

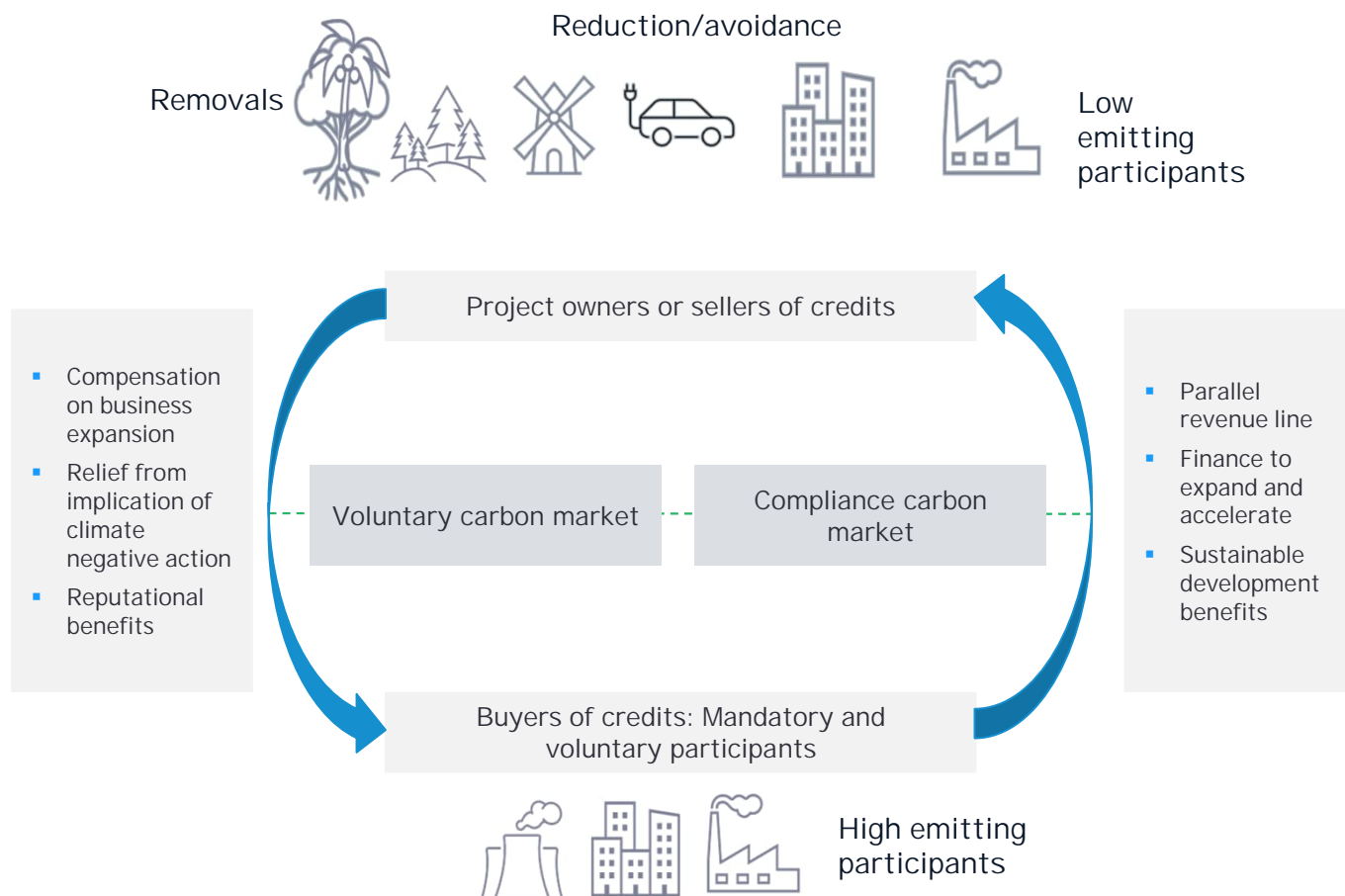
Prioritize RE and energy efficiency measures. Further, as the cost of technology reduces, leverage carbon capture and green H2 to curb emissions.



2 | Carbon markets

India's Carbon Credit Trading Scheme established in April 2025, operates with a dual approach, combining the mandatory emission reduction targets with Voluntary carbon mechanism

Carbon markets overview



1 What are carbon markets?

Carbon markets are carbon pricing mechanisms that enable governments and non-state actors to trade greenhouse gas emission credits. The aim is to achieve climate targets and implement climate actions cost-effectively.

2 Why are they important?

Developing countries need up to US\$6 trillion to meet climate goals. Current funding is vastly inadequate, with the IPCC report suggesting levels that are three to six times lower than needed by 2030.

Carbon markets are seen as a potential solution to finance climate action and incentivize governments and private entities to reduce their emissions.

3 What are various types of carbon markets?

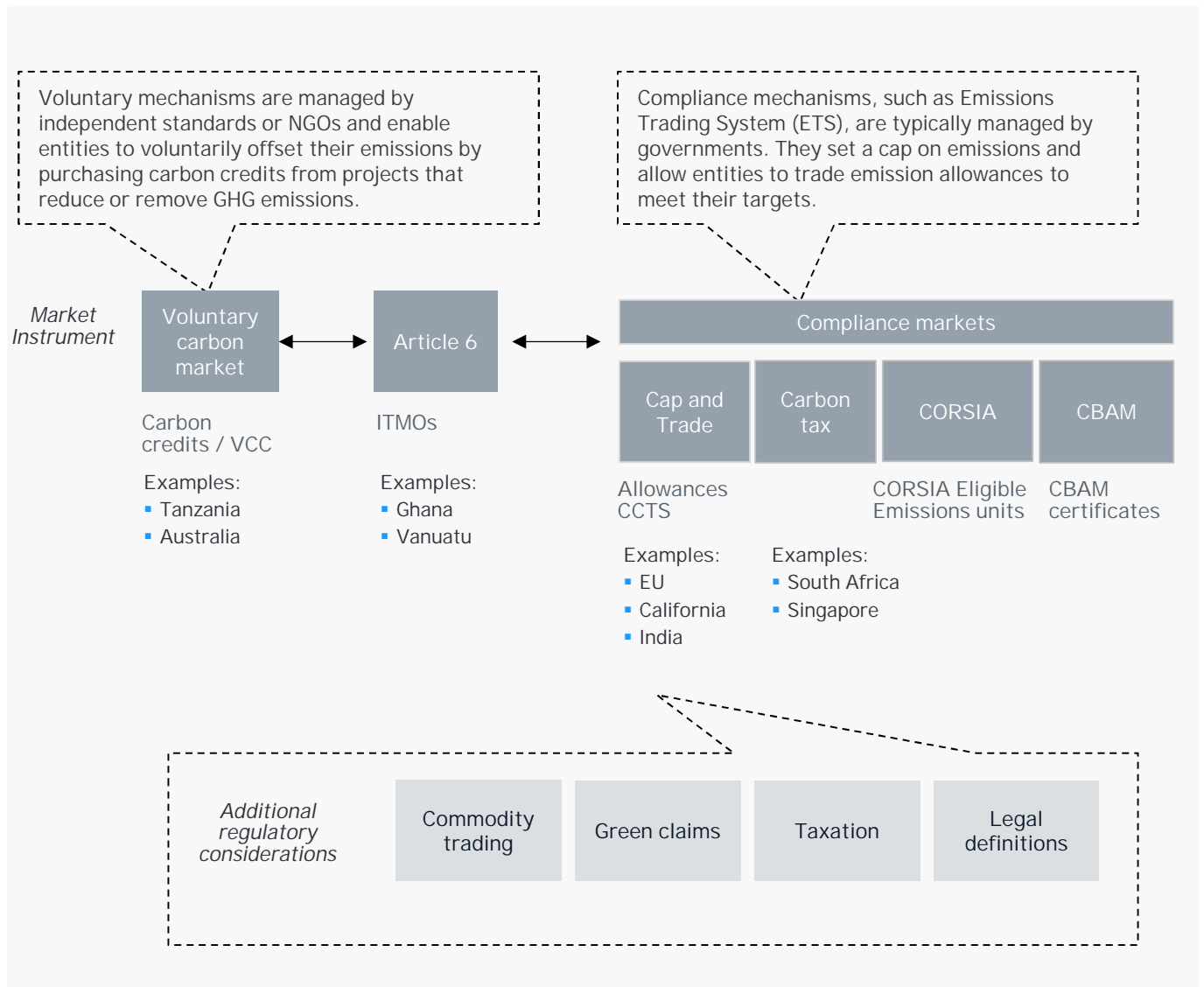
Compliance markets are created as a result of any national, regional and/or international policy or regulatory requirement.

- E.g., an emission trading system that uses "cap-and-trade" where businesses or countries get emission allowances and are required to buy additional credits if they exceed their caps.

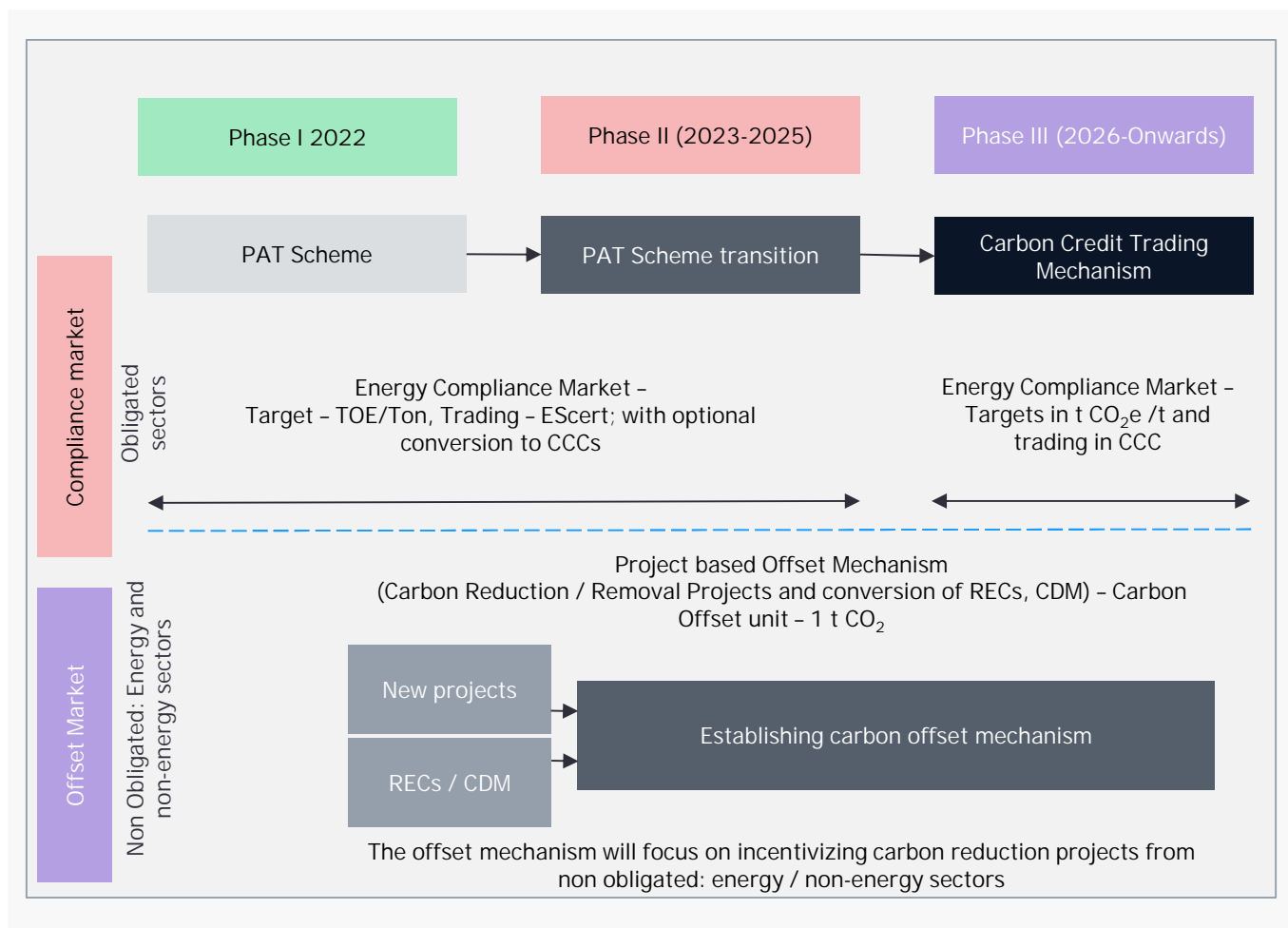
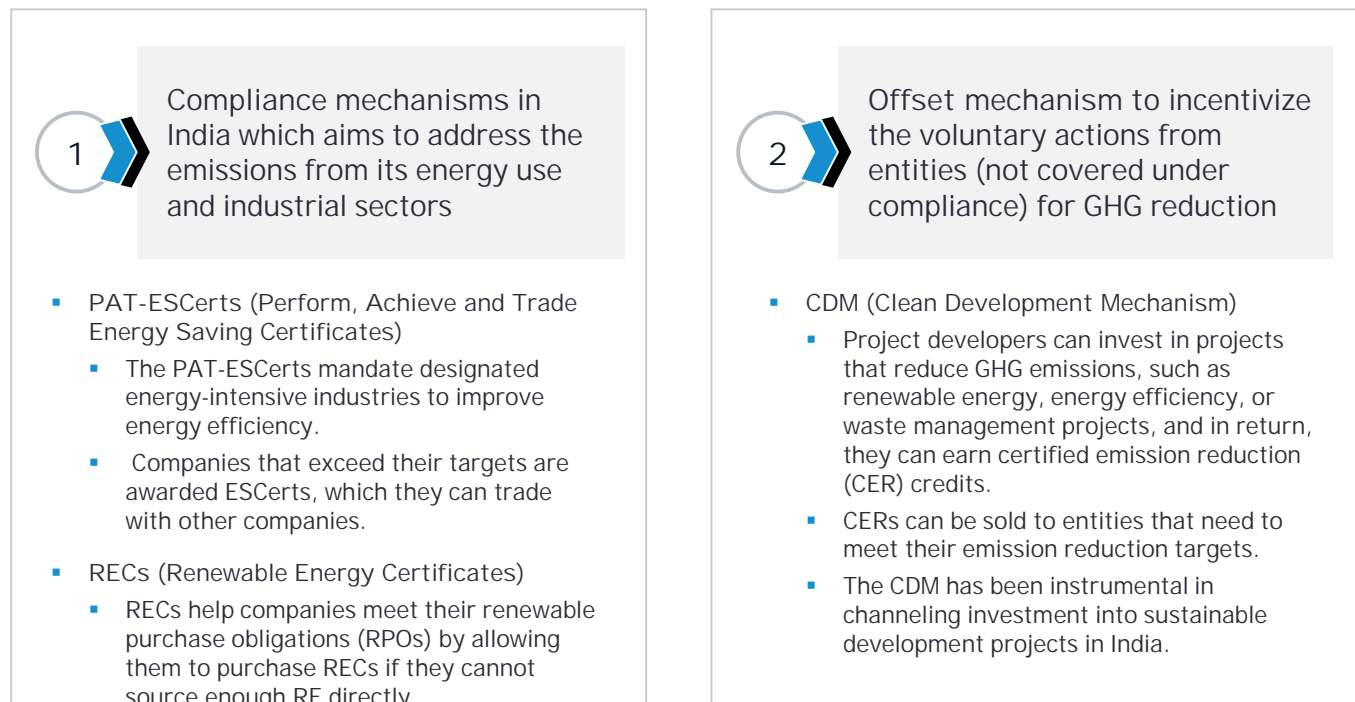
Voluntary markets refer to the issuance, buying and selling of carbon credits on a voluntary basis.

Mechanisms of carbon markets

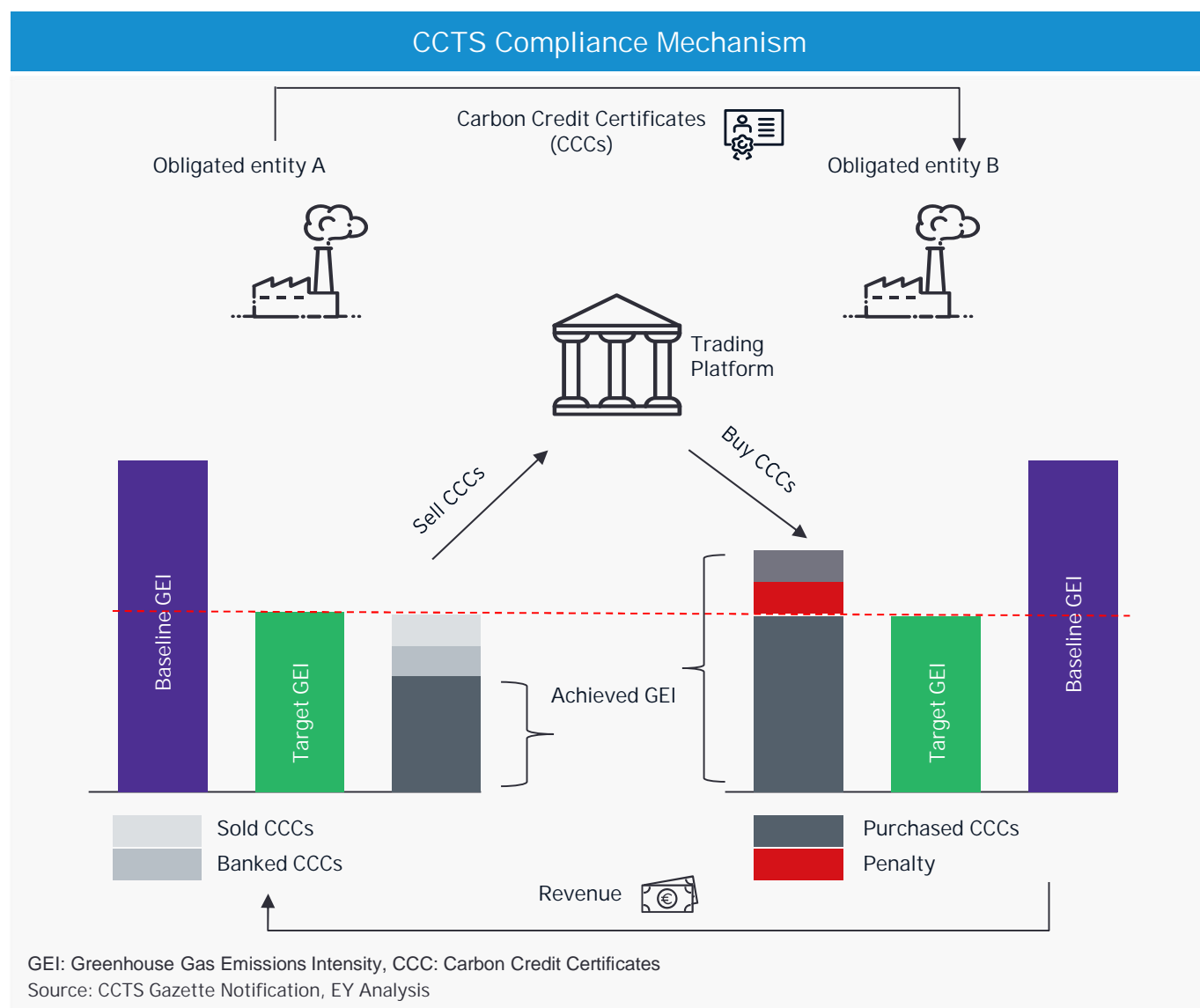
The multiple overlaps existing between these markets feed into a variety of credit trading opportunities



Indian carbon market framework operates with a mix of compliance and voluntary mechanisms



With the establishment of Carbon Credit Trading Scheme (CCTS) and regulatory mandates, companies will have the option to trade carbon reductions against their target GEI



Key aspects of CCTS

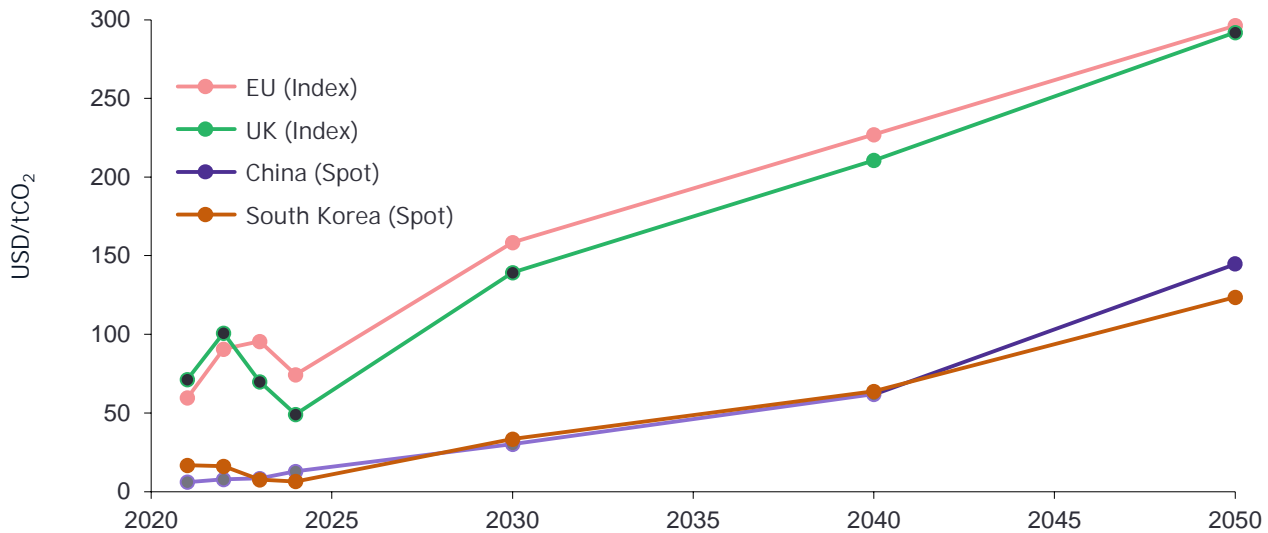
- The Compliance Mechanism under the Indian Carbon Market (ICM) aims to regulate and reduce greenhouse gas (GHG) emissions through a structured framework involving targets, monitoring, verification, and trading of carbon credit certificates (CCC)
- The initial set of sectors chosen under CCTS scheme are
- If an obligated entity's actual emission intensity is lower than the target, Bureau of Energy Efficiency (BEE) will issue CCCs equivalent to the difference, multiplied by the production volume.
- Entities failing to achieve their GEI targets will have to purchase corresponding number of CCCs to cover the excess emissions. Penalties will be applied on failing to meet compliance obligations.

- CCCs will be traded through the exchanges and the price of carbon will be dynamically decided as per the supply and demand of carbon credits.

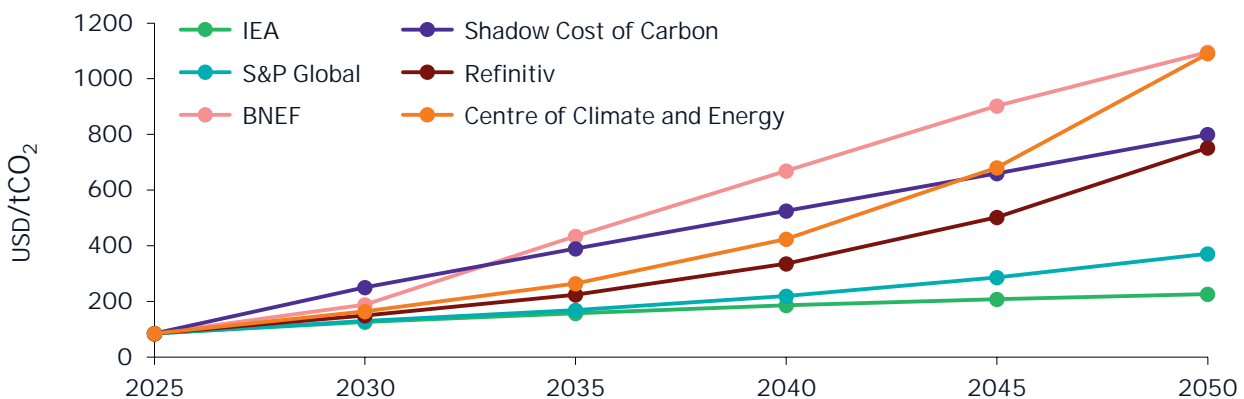
Final	Draft
Aluminium	Refinery & petrochemicals
Chlor-Alkali	Textiles
Cement	Iron and steel
Pulp & Paper	Aluminium

Evolution of carbon prices and projections across various geographies and India

Carbon prices: Historical



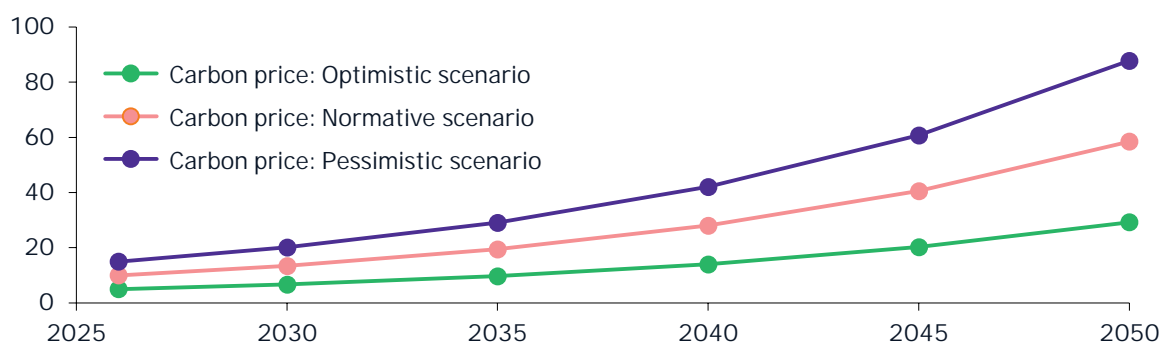
EU carbon prices: Projections



CAGR

IEA	S&P	BNEF	SCOC	Refinitiv	CCE
3.69%	5.60%	9.92%	8.65%	8.00%	10.00%

Indian carbon prices: Projections





3 | Sectoral decarbonization

Cement sector with total installed capacity of ~630 MMT contributes to ~20% of India's industrial GHG emissions

India's refinery sector trend (MMTPA)



Sector highlights

- The cement sector operates at a capacity utilization of 65% to 69%.
- As of 2024, India's share of cement exports is 2% to 3% of production capacity.
- India's cement industry has decreased its emissions intensity by 19.4% over the last five years, due to the use of alternative materials like fly ash and slag in blended cement production.
- The Indian cement sector is likely to add 150-160 MMT, bringing the total installed capacity to about 782-792 MMT by FY2028.



Parameters	Description
India's total installed cement capacity (FY2024)	632 million ton
India's share in global cement production (2024)	~10%
CO2 emissions from cement sector (FY2024)	~252.44 MMTCO2
PPC (blended) cement % in the industry	72%

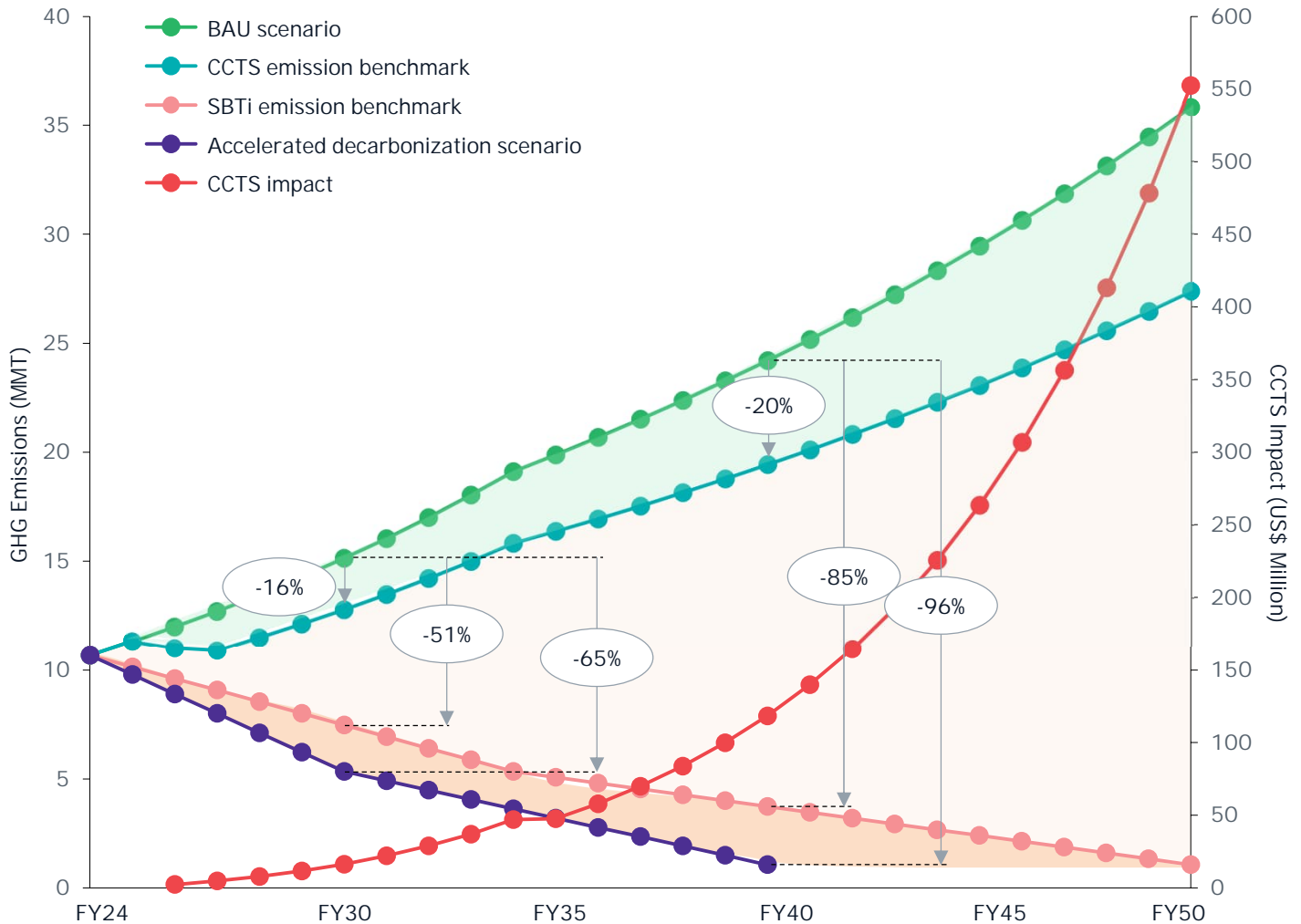
CCTS targets

- Sectoral reduction target
 - An average 2% to 6% reduction in emission intensity over the baseline during the compliance period would translate to an 8.67 MMT reduction of CO₂e (assuming constant installed capacity as per FY 2023-2024) by FY27.
 - During the compliance period, based on the production forecast, there is a potential net increase of 31.54 MMT of CO₂ e in absolute numbers.

Source: EYP Research, JMK Report, Ministry of commerce

Case study: A prominent cement company should decarbonize its assets to avoid penalties on 16% excess emissions above CCTS benchmarks

Emission scenarios with CCTS/ SBTi mandates and cost saving potential



Note:

- SBTi targets are aligned as per 1.5 Degree scenario with long term target of 50% emission reduction in 10 years and Net zero by 2050
- Accelerated decarbonization scenario targets 50% emission reduction by 2030 and net zero by 2040
- The Cement sector is projected to grow at 6% annually until FY 2035, after which the growth rate is expected to stabilize at 4% in the long term

The company would have to pay for these emissions under the CCTS scheme in case of BAU scenario (e.g., if the company does not decarbonize).

The company would have an emission differential of 51% by 2030 and 85% by 2040 if compared with SBTi targets.

The company would have an emission differential of 65% by 2030 and 96% by 2040 if compared with accelerated decarbonization targets.

- The company would have to pay for the excess emissions above CCTS benchmark.
- The CCTS penalty will differ as the growth rate increases and CCTS benchmark decreases if the company does not decarbonize.

- Since the SBTi line is below CCTS emission benchmark, adherence to the same and having an accelerated decarbonization journey can help the company avoid CCTS penalties.

Source: EY-Parthenon Analysis

Case study: The company is expected to incur a financial implication of ~INR314-320 crore from 2026 to 2030 due to the impact of CCTS, if no decarbonization is undertaken

Sensitivity Analysis highlighting financial impact FY 26-30 (INR cr.)

Sensitivity table	Production growth scenario	No growth	Expected growth	Normative (cement sector growth benchmark)	Optimistic
CCTS industry benchmark scenario	%	0%	4%	6%	8%
As-is (Present)	As per BEE Gazette	239-245	287-293	314-320	343-349
Industry weighted average	Average of all plants (category wise) (in terms of GEI)	238-244	286-292	312-318	341-347
Pessimistic (stricter targets)	-5% (GEI target lower Industry weighted avg)	458-464	543-549	591-597	642-648
Optimistic (lenient targets)	+5% (GEI target higher than Industry weighted avg)	18-24	28-34	33-39	39-45

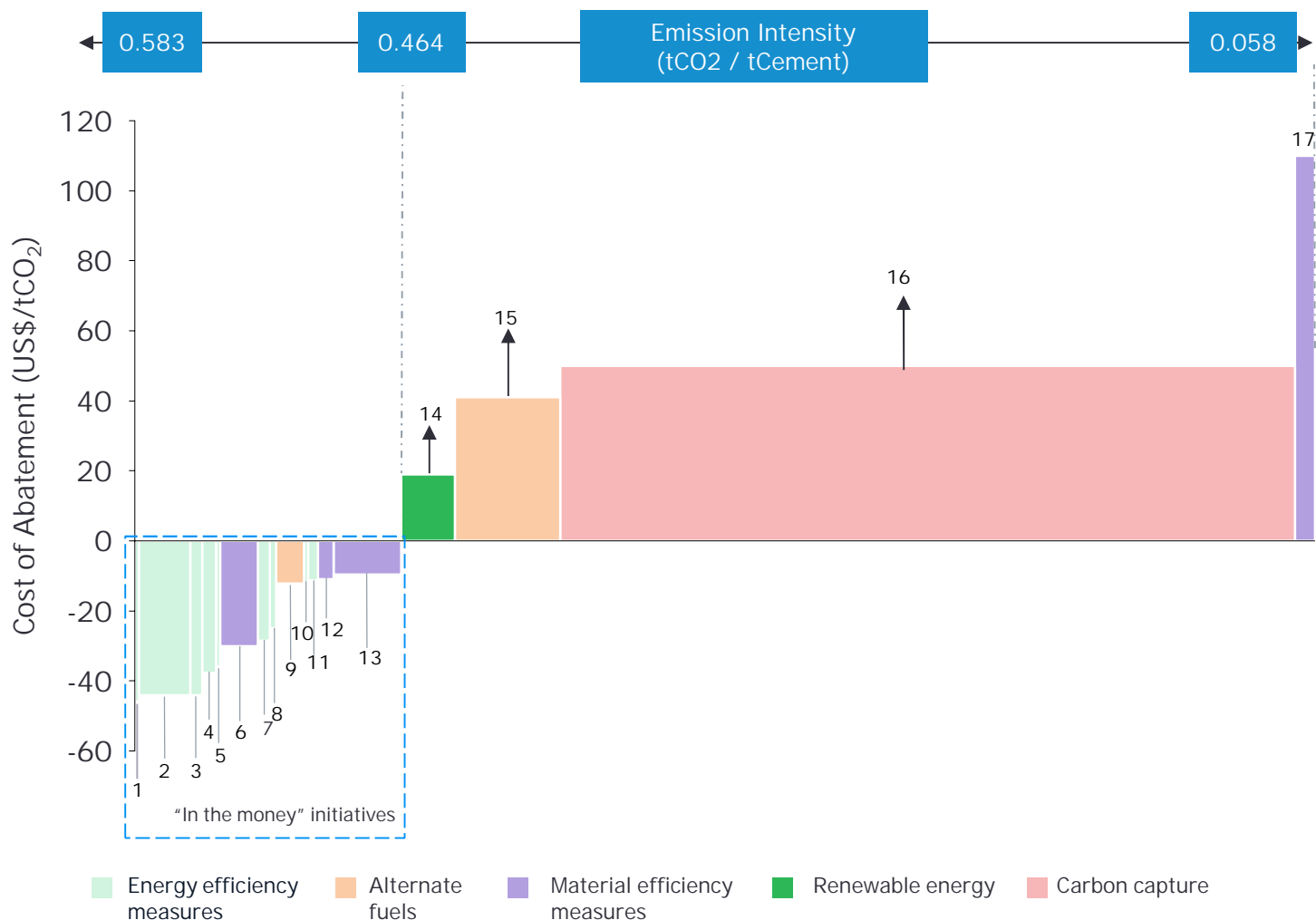


Insights

- In the BAU scenario, taking into account no industry growth for cement, the company is projected to experience a financial impact of ~ INR314 crore from 2025 to 2030, considering the carbon price at US\$10 per ton of CO₂.
- The costs in the table represent the cost of not decarbonizing for the company's plants.
- Assumptions:
 - Nine plants of the company have been considered for analysis in this table (taken directly from the GoI Gazette by BEE).
 - The financial impact is calculated cumulatively from 2026 to 2030. The net present value of the impact has been mentioned in the table.
 - A carbon price scenario with a normative pricing of US\$10 has been taken into account for the analysis
 - Production growth scenarios have been built based on the cement sector trends in India.
 - The "Industry Weighted Average" for GHG emission intensity has been established based on the performance of all the companies in the particular sub-sector (PPC, OPC, grinding).
 - The CCTS benchmark sensitivity scenarios have been built based on +5% and -5% of the "Industry Weighted Average" intensity benchmark.

Source: EY Analysis

Indian cement sector has multiple pathways to decarbonization, with carbon capture emerging as the most crucial lever for CO₂ reduction; and energy efficiency measures leading to cost savings



"In the money" initiatives

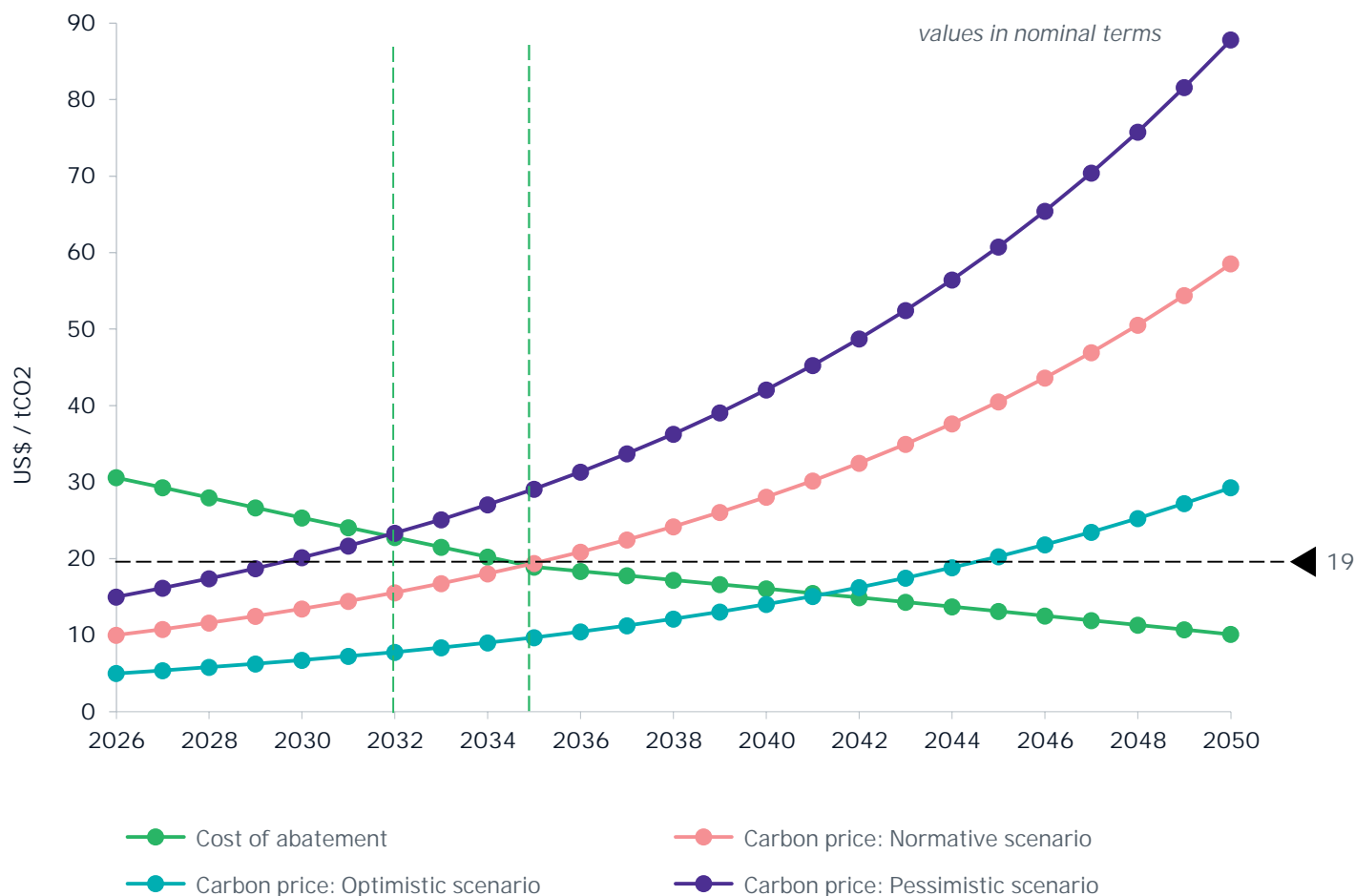
1. Efficient electrical equipment	5. Optimising auxiliary power	9. Improving burnability of material	13. Increasing fly ash to 35% in PPC
2. Waste Heat Recovery	6. Increasing slag to 70% in PSC	10. Burner retrofit	14. Renewable energy use in electricity
3. Automation System	7. Enhancement in Kiln	11. High efficiency clinker coolers	15. Increasing TSR to 30% in kiln fuel
4. Efficient Grinding System	8. Heat rate reduction in CPP	12. Substitute OPC with LC3 cement	16. Carbon Capture
			17. Decreasing Clinker to 85% in OPC

Note: 1. Carbon capture costs includes capturing CO₂ from source, and excludes the costs of CO₂ for storage/utilization. 2. Cost savings are in nominal terms

Source: CEEW, EYP Analysis

The Indian cement industry stands to gain by investing in decarbonization technologies early on, as purchasing carbon credit certificates will become expensive in the future

Indian Cement Industry: Cost of Abatement v/s Carbon Prices



Insights

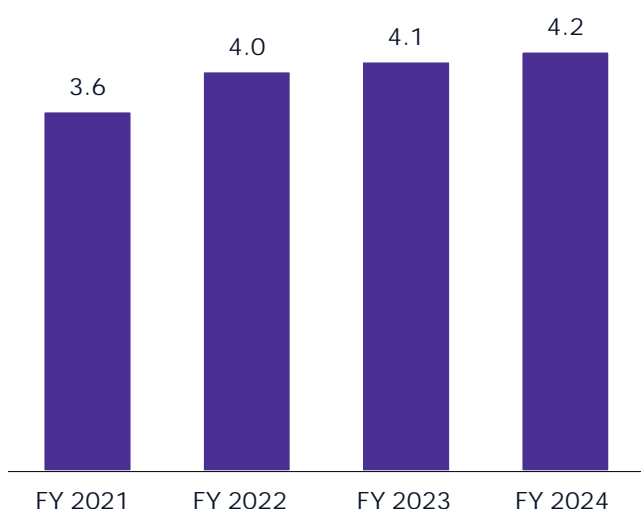
- By abating CO2 emissions at a cost lower than the carbon price, the cement industry may realize significant cost savings by overcoming the higher costs tied to carbon prices.
- In a normal scenario, it is projected that by the year 2036, the cost of decarbonization will drop below US\$19/tCO2. Concurrently, carbon prices in India are expected to rise above this level.
- As these technologies scale and mature in the coming years, the cost of decarbonization will continue to decline, creating stronger and faster incentives for the cement industry.

Key notes:

- A carbon price scenario with a normative pricing of US\$10/tCO2 in 2026 has been taken into account for the analysis.
- In pessimistic and optimistic scenarios, the carbon price starts at US\$15 and US\$5, respectively.
- All identified decarbonization levers are considered simultaneously to plot the blended cost of abatement in each year.

Aluminum sector, with a total installed capacity of 4.2 MMT (primary), contributes to ~8% of India's industrial GHG emissions; CCTS targets mandatory reduction of ~4.3 MMT of CO₂ by FY27

India's primary aluminium production trend (MMT)



Highlights

- From FY2021 to FY2024, India's aluminum production has seen moderate growth, increasing from 3.6 MMT to 4.2 MMT, reflecting a CAGR of 5.3%.
- As of 2024, aluminum exports from India total around 2.45 MMT, of which 0.3 MMT is being exported to the European Union.
- Exports to the EU represented 30% of India's total aluminum exports in FY2023. However, this share dropped to 17% in FY2024, indicating the expected effects of carbon pricing under the CBAM.
- The aluminum sector in India accounts for 8% of the country's industrial GHG emissions, totaling 82.72 MMT CO₂ e (2023).
- The country recorded exports of aluminum and its related articles worth INR63,34 crore (US\$7.54 billion).

Parameters

Description

Global aluminum production (2024)	~72 MMT
Indian aluminum market size	INR1,09,950 cr. (US\$12.14 billion)
India's share in global aluminum production (2024)	~5.5%
Indian GHG emissions* (FY2024)	~73 MMTCO ₂ e

CCTS targets

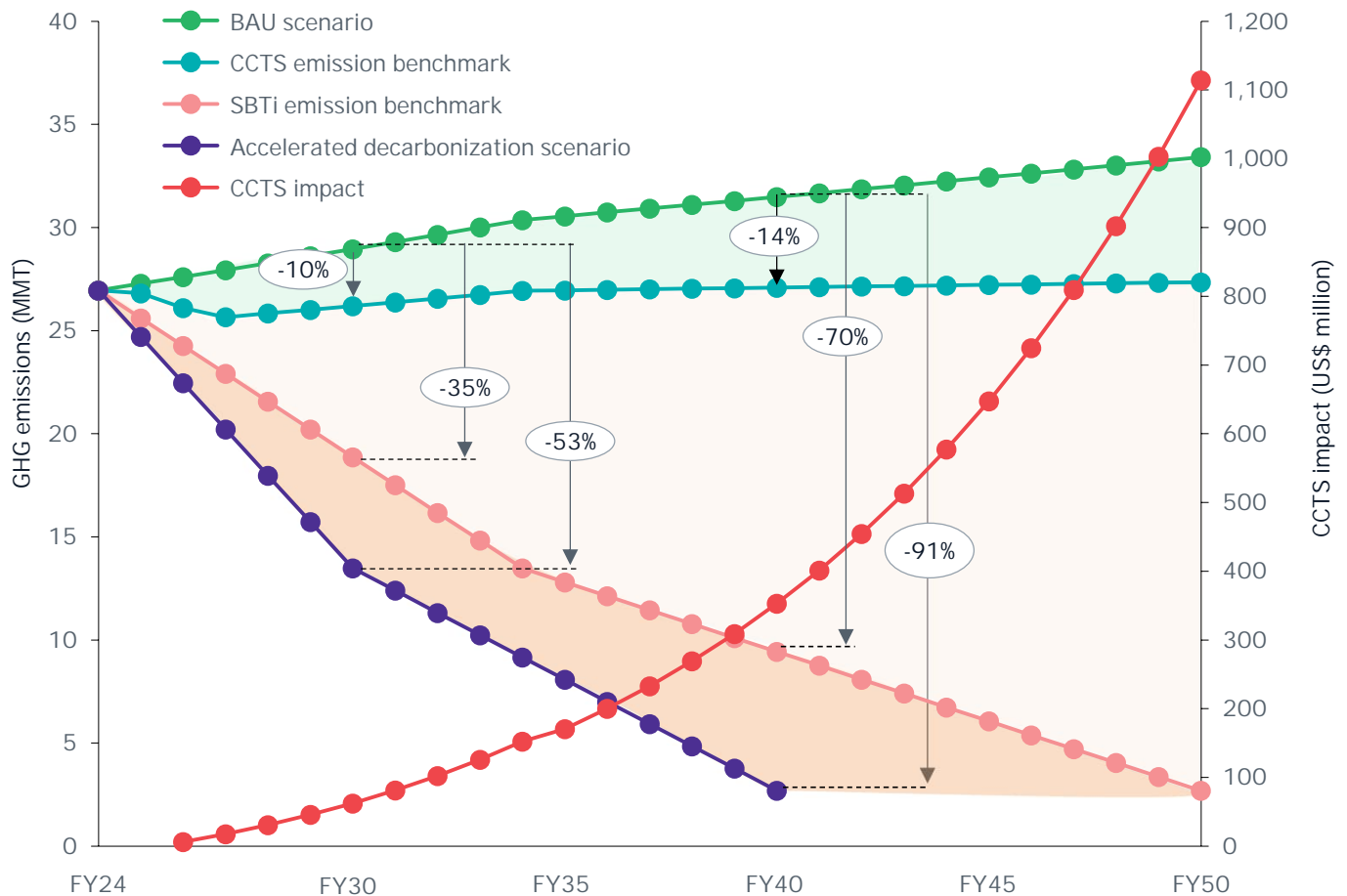
- Sectoral Reduction target
 - An average 4-7% reduction in emission intensity over baseline during compliance period would translate to ~4.3 MMT reduction of CO₂ e by FY27 (assuming constant installed capacity as per FY 2023-2024)
 - During the compliance period, based on the production forecast, there is a potential net decrease of ~1.74 MMT of CO₂ emissions

Source: EYP Research, Annual reports, Ministry of commerce

*Emissions include scope 1 + scope 2

Case Study: A renowned aluminum company should start decarbonizing their assets to avoid CCTS penalties on 10-14% emissions differential from BaU

Emission scenarios with CCTS/ SBTi mandates and cost saving potential



Source: EY-Parthenon Analysis

Note:

1. SBTi targets are aligned as per 1.5 Degree scenario with long term target of 50% emission reduction in 10 years and Net zero by 2050
2. Accelerated decarbonization scenario targets 50% emission reduction by 2030 and net zero by 2040
3. The Aluminium sector is projected to grow at 1.2% annually until FY 2035, after which the growth rate is expected to stabilize at 0.6% in the long term

The company would have to pay for these emissions in CCTS scheme in case of BAU scenario (eg: if company does not decarbonize)

The company would have an emission differential of 35% by 2030 and 70% by 2040 if compared with SBTi targets

The company would have an emission differential of 53% by 2030 and 91% by 2040 if compared with Accelerated Decarbonization targets

- The company would have to pay for the excess emissions above CCTS benchmark
- The CCTS penalty will differ as the growth rate increases and CCTS benchmark decreases if the company does not decarbonize

- Since the SBTi line is below CCTS emission benchmark, adherence to the same and having an accelerated decarbonization journey can help the company avoid CCTS penalties

Normative carbon pricing: The company is expected to face a financial implication of ~INR 1,179-1185 crore from 2026 to 2030 due to CCTS impact if no decarbonization is undertaken

Sensitivity analysis highlighting financial impact FY 26-30 (cr.)

Sensitivity table	Production growth scenario	No growth	Pessimistic	Normative (<i>textile growth benchmark</i>)	Optimistic
CCTS Industry Benchmark scenario	%	0%	0.6%	1.2%	1.8%
As-is (Present)	As per BEE Gazette	1113-1119	1146-1152	1179-1185	1213-1219
Industry Weighted Average	Average of all plants (category wise) (<i>in terms of GEI</i>)	1036-1042	1062-1068	1089-1095	1115-1121
Pessimistic (stricter targets)	-5% (<i>GEI target lower Industry weighted avg</i>)	1362-1368	1395-1401	1429-1435	1464-1470
Optimistic (lenient targets)	+5% (<i>GEI target higher than industry weighted avg</i>)	711-717	729-735	748-754	767-773

Source: EY-Parthenon Analysis



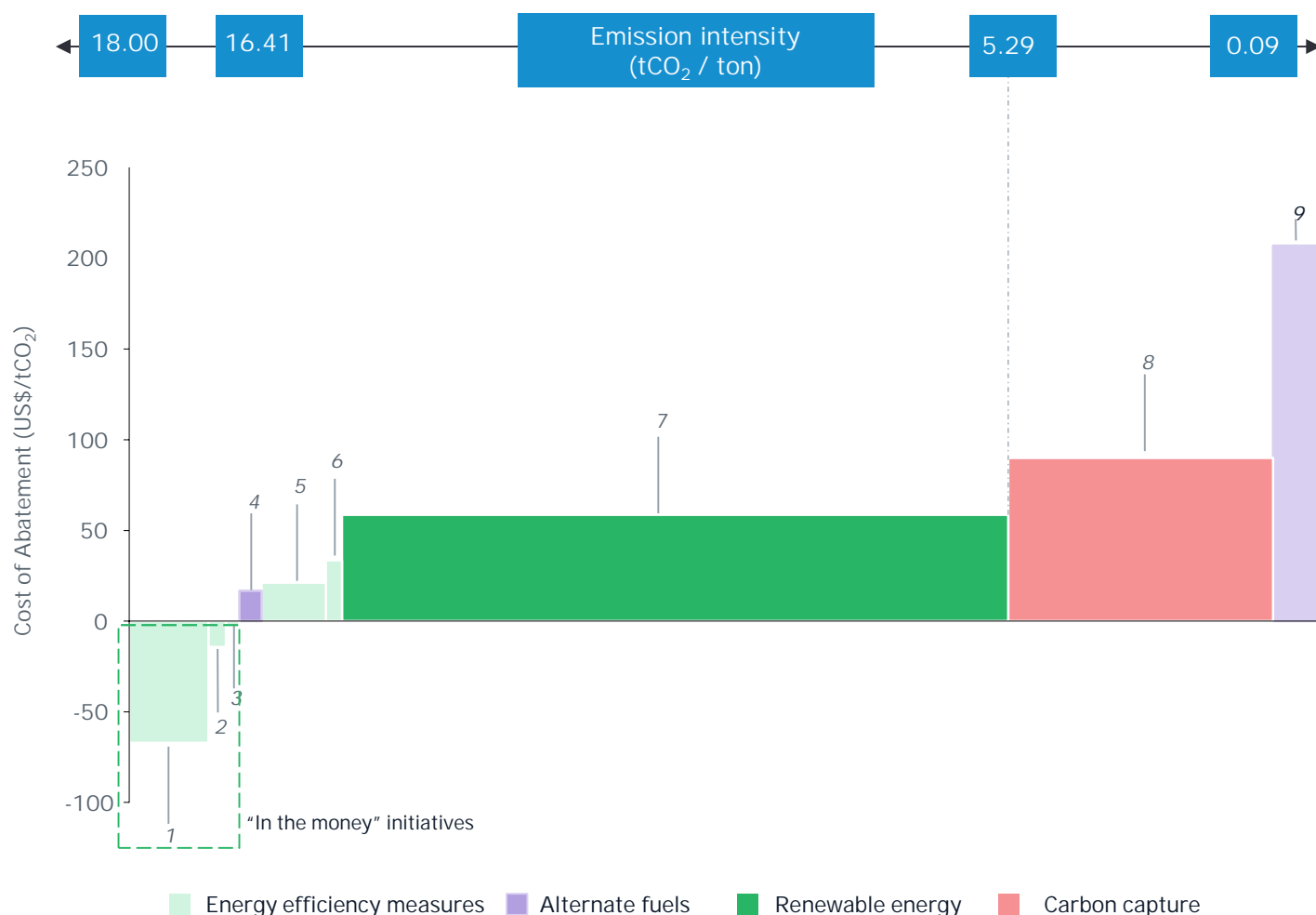
Insights

- In the BAU scenario, taking into account a 1.2% industry growth rate for aluminum, the company is projected to incur a financial impact of INR1,179-1,185 crore from 2026 to 2030, considering the carbon price at US\$10 per ton of CO₂.
- The costs in the table represent the cost of not decarbonizing for the company plants.

Assumptions:

- Four plants of the company have been considered for analysis in this table (taken directly from the GoI Gazette by BEE).
- The financial impact is calculated cumulatively from 2025 to 2030. The net present value of the impact has been mentioned in the table.
- A carbon price scenario with a normative pricing of US\$10 has been taken into account for the analysis.
- Production growth scenarios have been built basis the aluminum sector trends in India.
- The "Industry Weighted Average" for GHG emission intensity has been considered for scenario analysis.
- The CCTS benchmark sensitivity scenarios have been built basis +5% and -5% of the "Industry Weighted Average" intensity benchmark.

RE is the key decarbonization lever for the Indian aluminium sector, particularly in the smelting process, with carbon capture and energy efficiency acting as other key measures



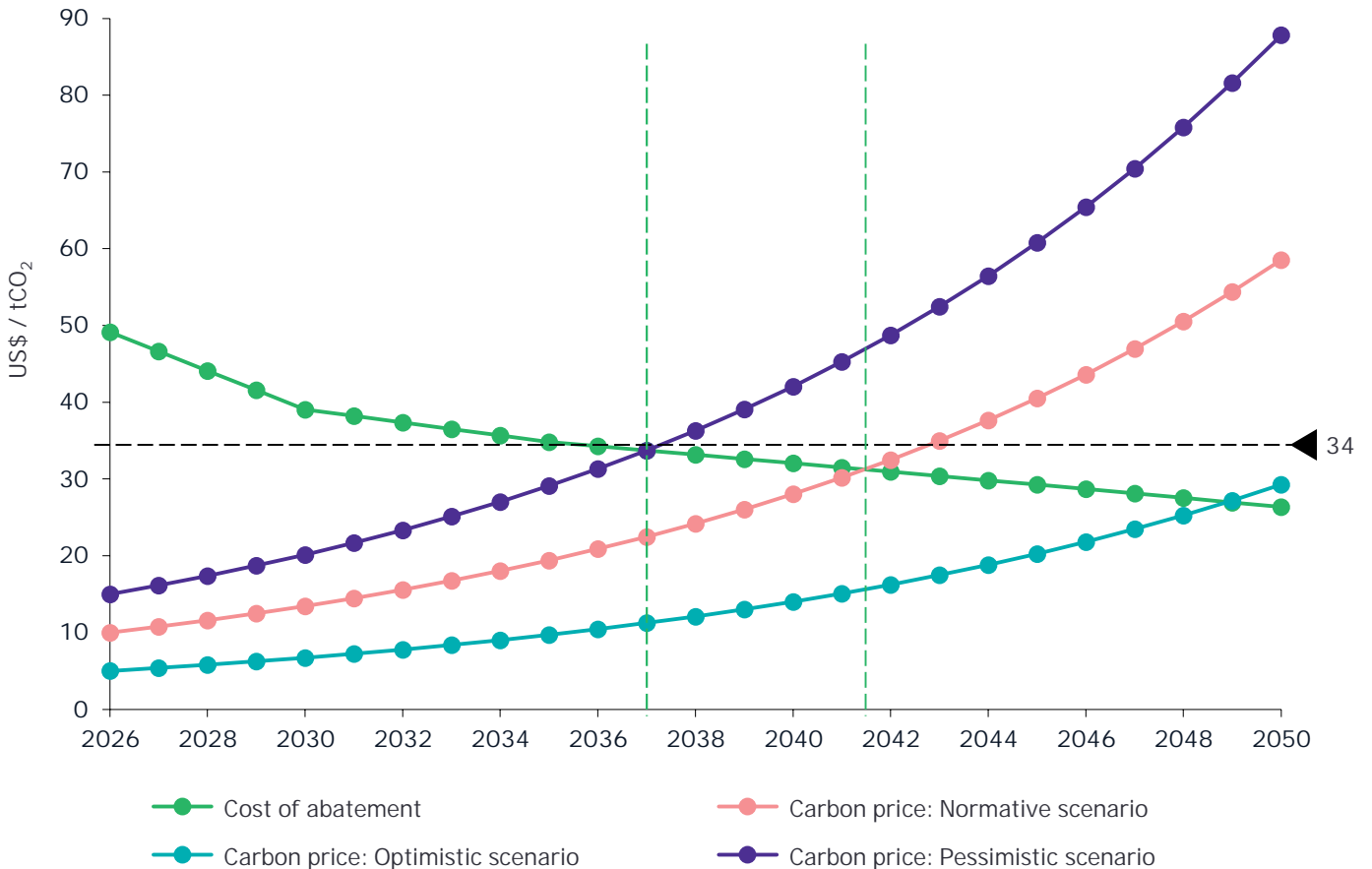
Source: CEEW, EYP Analysis

Note: Carbon capture costs includes capturing CO₂ from source, and excludes the fate of captured CO₂ for storage/utilization

1. Alumina EE	4. Biomass fuel switch	7. Renewable electricity
2. Aluminium energy efficiency	5. Inert anodes	8. Carbon capture
3. Electrolysis off gas WHR	6. Cell operation optimization	9. NG fuel switch

The Indian aluminum industry may begin investing in decarbonization technologies now, as abatement costs are expected to fall below Indian carbon prices by the next decade

Indian Aluminium Industry: Cost of Abatement v/s Carbon Prices



Source: EY-Parthenon Analysis

Insights

- By abating CO₂ emissions at a cost lower than the carbon price, the aluminum industry may realize significant cost savings by overcoming the higher costs tied to carbon prices.
- In a pessimistic scenario, it is projected that by the year 2037, the cost of decarbonization will drop below US\$34/tCO₂. Concurrently, carbon prices in India are expected to rise above this level.
- As the technologies scale further and matures in upcoming years, the cost of decarbonization decreases further, leading to quicker incentivization for the aluminum industry.

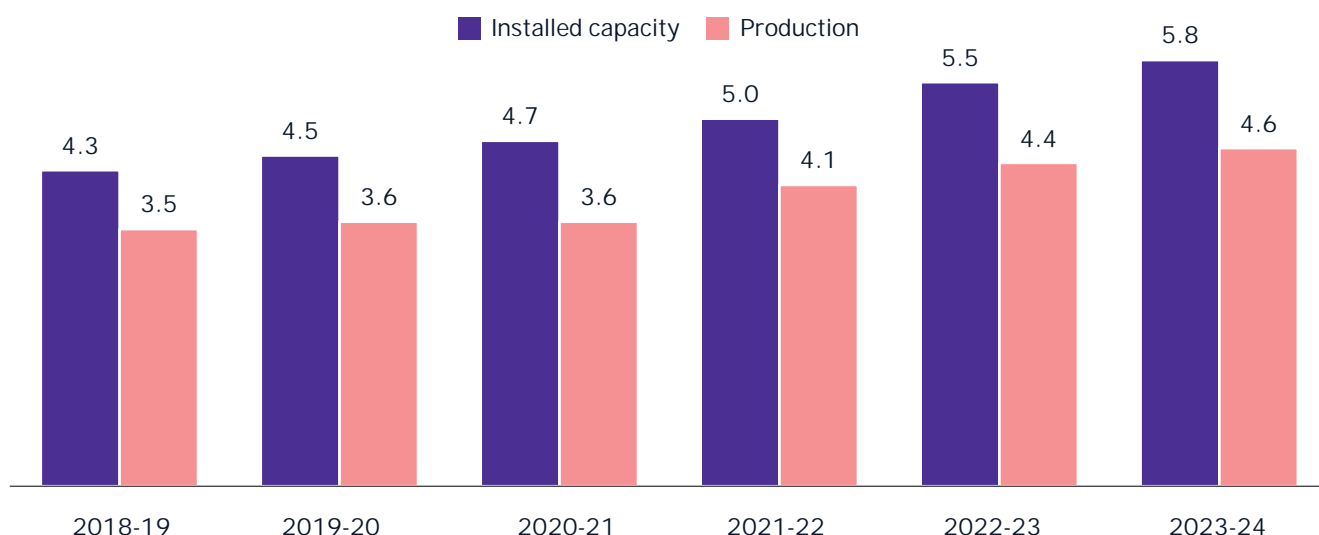
Assumptions:

- A carbon price scenario with a normative pricing of US\$10/tCO₂ in 2026 has been taken into account for the analysis.
- In pessimistic and optimistic scenarios, carbon price starts at US\$15 and US\$5, respectively.
- All identified decarbonization levers are considered at once to plot the blended cost of abatement in each year.

Source: EY-Parthenon Analysis

Overview of the caustic soda market size, production trends, capacity and the import and export market; CCTS targets a mandatory reduction of ~0.66 MMT of CO₂ by FY27

India's Caustic Soda production trend (MMT)



Highlights

- The caustic soda sector operates at a capacity utilization of ~80% and is growing at a CAGR of 6.2%.
- Indian exports of caustic soda reached 465 KT in 2023-24, while imports have significantly decreased over the years, totaling 221 KT in the same period.
- The production of chlorine during 2023-24 was 40.87 lakh MMT, compared to 39.63 lakh MMT in 2022-23, an increase of 3.1%.
- India recently introduced a new environmental framework for caustic soda manufacturing, establishing emission and effluent standards to regulate hydrochloric acid emissions and limit wastewater generation, effective March 2026.



Parameters

Description

Global caustic soda production (2024)

~98 million metric ton

Indian caustic soda market size

INR32,000-35,000 cr (~US\$3.8-4.2 billion)

India's share in global caustic soda production

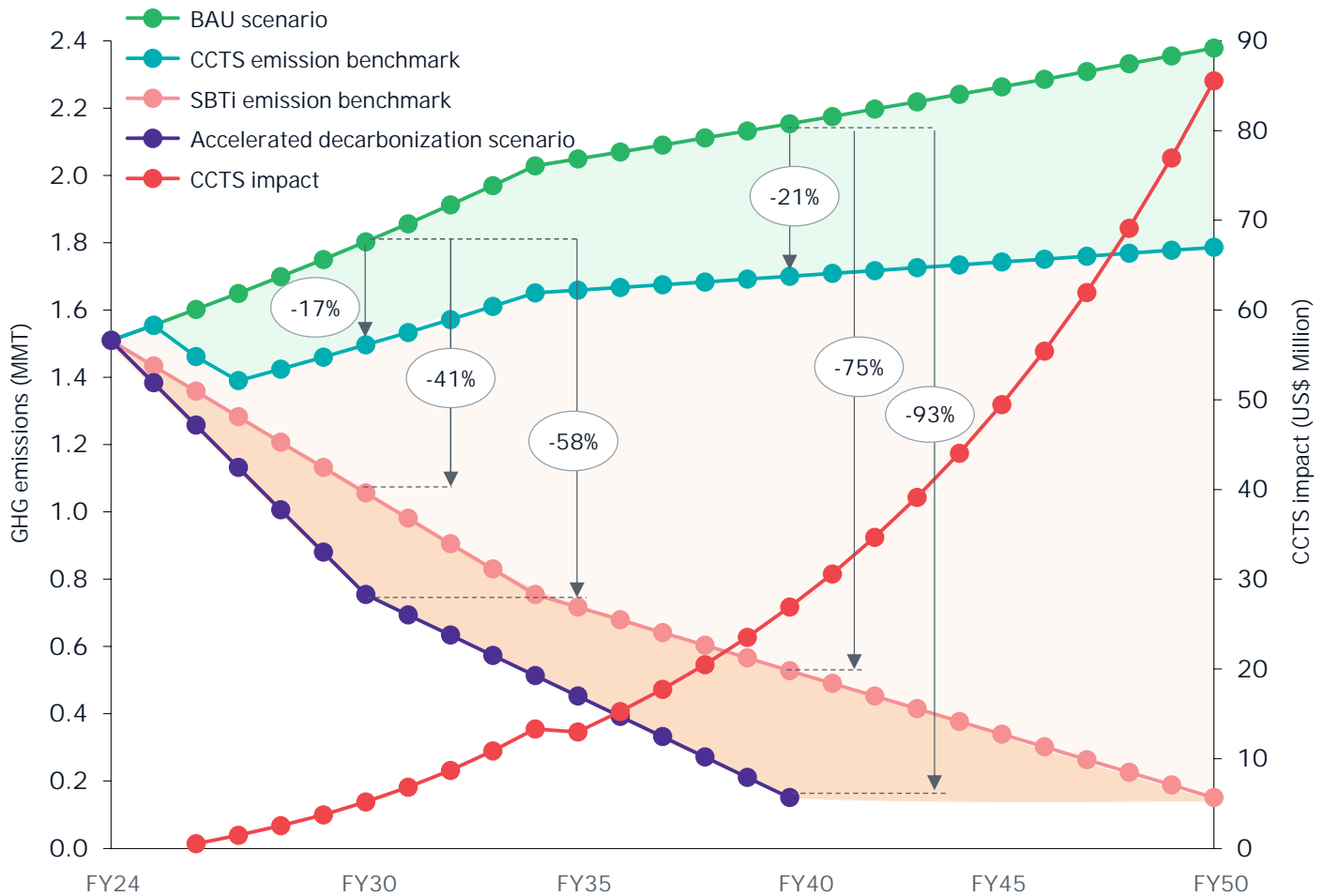
~5.5%

CCTS targets

- Sectoral reduction target
 - An average 6%-9% reduction in emission intensity over the baseline during the compliance period.
 - This would translate to ~0.66 MMT reduction of CO₂ e by FY27.

Case Study: A leading company should start decarbonizing their assets to avoid CCTS penalties on 17-21% emissions differential from BaU

Emission scenarios with CCTS/ SBTi mandates and cost saving potential



Note:

1. SBTi targets are aligned as per 1.5 Degree scenario with long term target of 50% emission reduction in 10 years and Net zero by 2050
2. Accelerated decarbonization scenario targets 50% emission reduction by 2030 and net zero by 2040
3. The Chlor-alkali sector is projected to grow at 3% annually until FY 2035, after which the growth rate is expected to stabilize at 1% in the long term

The company would have to pay for these emissions in CCTS scheme in case of BAU scenario (eg: if company does not decarbonize)

The company would have an emission differential of 41% by 2030 and 75% by 2040 if compared with SBTi targets

The company would have an emission differential of 58% by 2030 and 93% by 2040 if compared with Accelerated Decarbonization targets

- The company would have to pay for the excess emissions above CCTS benchmark
- The CCTS penalty will differ as the growth rate increases and CCTS benchmark decreases if the company does not decarbonize

- Since the SBTi line is below CCTS emission benchmark, adherence to the same and having an accelerated decarbonization journey can help the company avoid CCTS penalties

Source: EY-Parthenon Analysis

Normative carbon pricing: The company is expected to incur a financial implication of ~INR 94-100 cr. from 2026 to 2030 due to the impact of CCTS

Sensitivity Analysis highlighting financial impact FY 26-30 (cr.)

Sensitivity table	Production growth scenario	No growth	Pessimistic	Normative (<i>textile growth benchmark</i>)	Optimistic
CCTS industry benchmark scenario	%	0%	1%	3%	5%
As-is (Present)	As per BEE Gazette	81-87	86-92	94-100	104-110
Industry weighted average	Average of all plants (category wise) (<i>in terms of GEI</i>)	104-110	109-115	118-124	128-134
Pessimistic (stricter targets)	-5% (<i>GEI target lower than Industry weighted avg</i>)	104-110	109-115	118-124	128-134
Optimistic (lenient targets)	+5% (<i>GEI target higher than Industry weighted avg</i>)	103-109	108-114	118-124	127-133



Insights

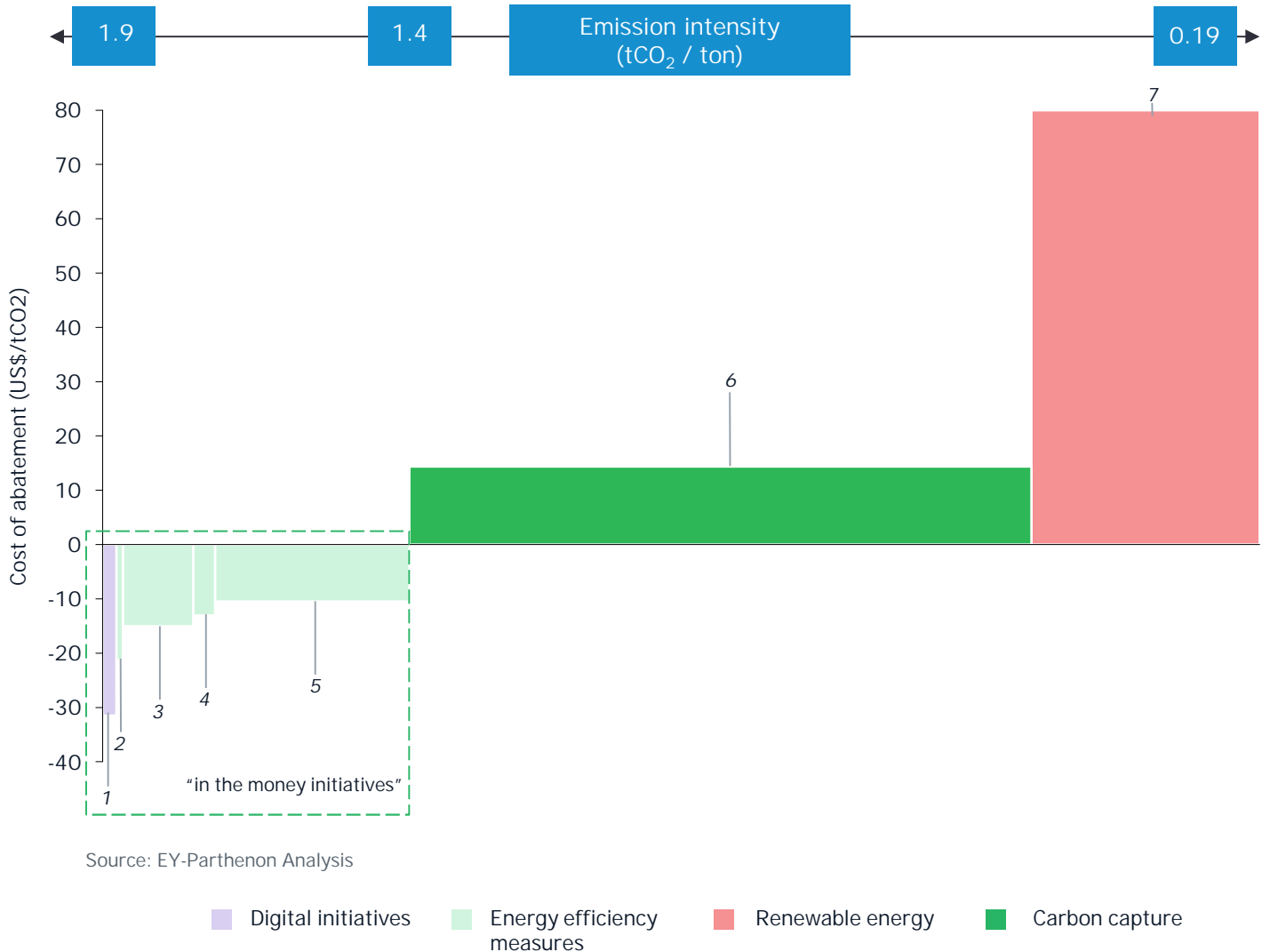
- In the BAU scenario, taking into account a 3% industry growth rate for chlor-alkali, the company is projected to experience a financial impact of INR94-100 crore from 2025 to 2030, considering the carbon price at US\$10 per ton of CO2 equivalent.
- The costs in the table represent the cost of not decarbonizing for the company's plants.

Assumptions:

- Two plants of the company have been considered for analysis in this table (taken directly from the Gol Gazette by BEE).
- The financial impact is calculated cumulatively from 2026 to 2030. The net present value of the impact has been mentioned in the table.
- A carbon price scenario with a normative pricing of US\$10 has been taken into account for the analysis
- Production growth scenarios have been built basis the chlor-alkali sector trends in India.
- The "Industry Weighted Average" for GHG emission intensity has been considered for scenario analysis.
- The CCTS benchmark sensitivity scenarios have been built basis +5% and -5% of the "Industry Weighted Average" intensity benchmark.

Source: EY-Parthenon Analysis

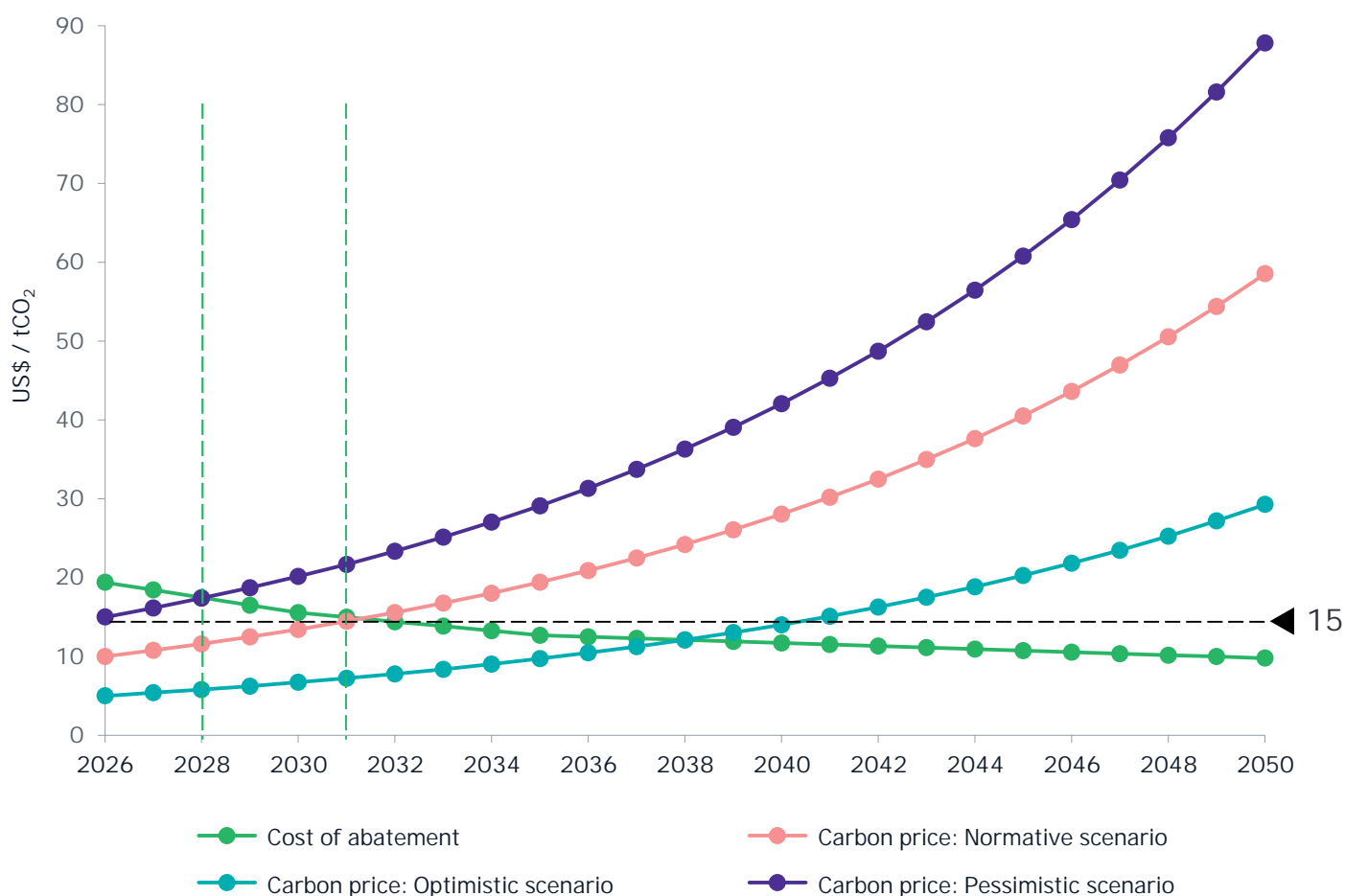
RE is the key decarbonization lever for the Indian Chlor-Alkali sector, with energy efficiency measures acting as important abatement lever



1. Digital twin	3. MVR	5. Zero gap electrolysis
2. Brine temperature control	4. Brine purification	6. Renewable electricity (80% RE)
		7. Carbon capture

The Indian Chlor Alkali sector may start investing in decarbonization technologies now, as the cost of abatement is projected to drop below the Indian carbon prices in next 5 years

Indian Chlor-Alkali Industry: Cost of Abatement v/s Carbon Prices



Insights

- By abating CO₂ emissions at a cost lower than the carbon price, chlor-alkali industry may realize significant cost savings by overcoming the higher costs tied to carbon prices.
- In a normative scenario, it is projected that by the year 2031, the cost of decarbonization will drop below US\$15/tCO₂. Concurrently, carbon prices in India are expected to rise above this level.
- As the technologies scale further and matures in upcoming years, the cost of decarbonization decreases further, leading to quicker incentivization for the chlor-alkali sector.

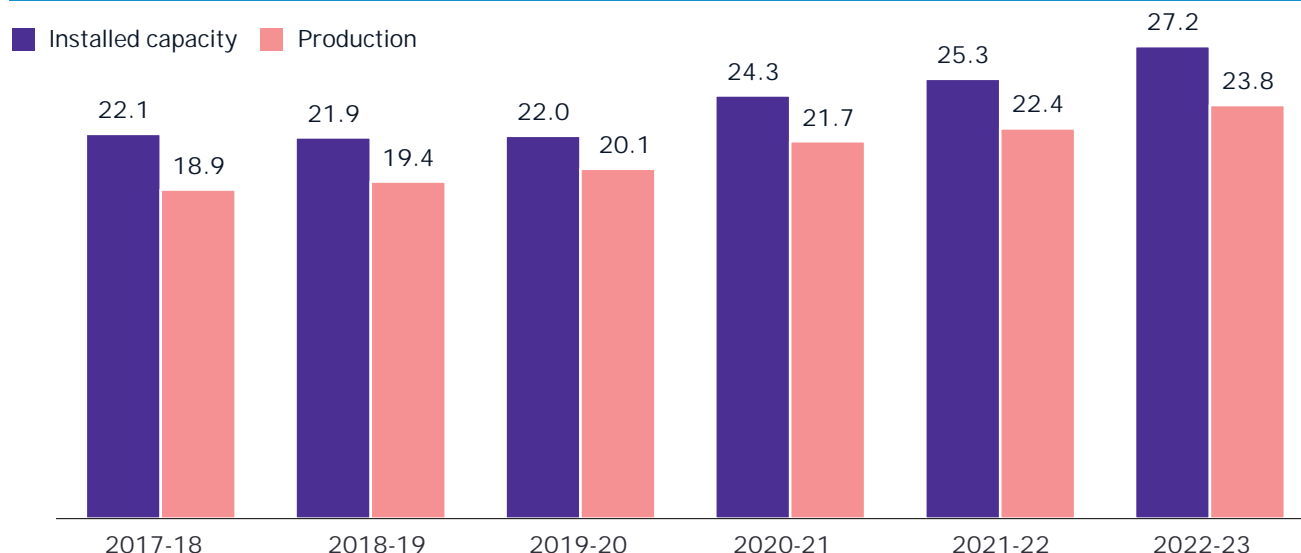
Assumptions:

- A carbon price scenario with a normative pricing of US\$10/tCO₂ in 2026 has been taken into account for the analysis.
- In the pessimistic and optimistic scenarios, carbon price starts at US\$15 and US\$5, respectively.
- All identified decarbonization levers are considered at once to plot the blended cost of abatement in each year.

Source: EY-Parthenon Analysis

Overview of the paper industry market size, production trends, capacity and import and export markets; CCTS targets a mandatory reduction of ~750 KT of CO₂ by FY27

India's paper industry production trend (MMT)



Highlights

- The paper industry operates at a capacity utilization of ~88% and at a CAGR of 5.8%.
- Import of paper, paperboard and newsprint has grown from 1.785 MMT in 2010-11 to 2.59 MMT in 2023-24
 - Overall, Imports have risen at a CAGR of 11% in value terms (from INR 3,411 cr. in 2010-11 to INR 13,248 cr. in 2023-24)
- Exports of paper, paperboard and newsprint have increased almost three times from 0.53 MMT in 2010-11 to 1.56 MMT in 2023-24.
- FDI inflows in paper and pulp until September 2024 was INR15,121 crore (US\$1.74 billion).

Parameters

Description

No of paper mills	850-870 (~520 operational)
Annual revenue	INR80,000 crore
India's share in global production	5-6%
Production capacity	27.15 MMT

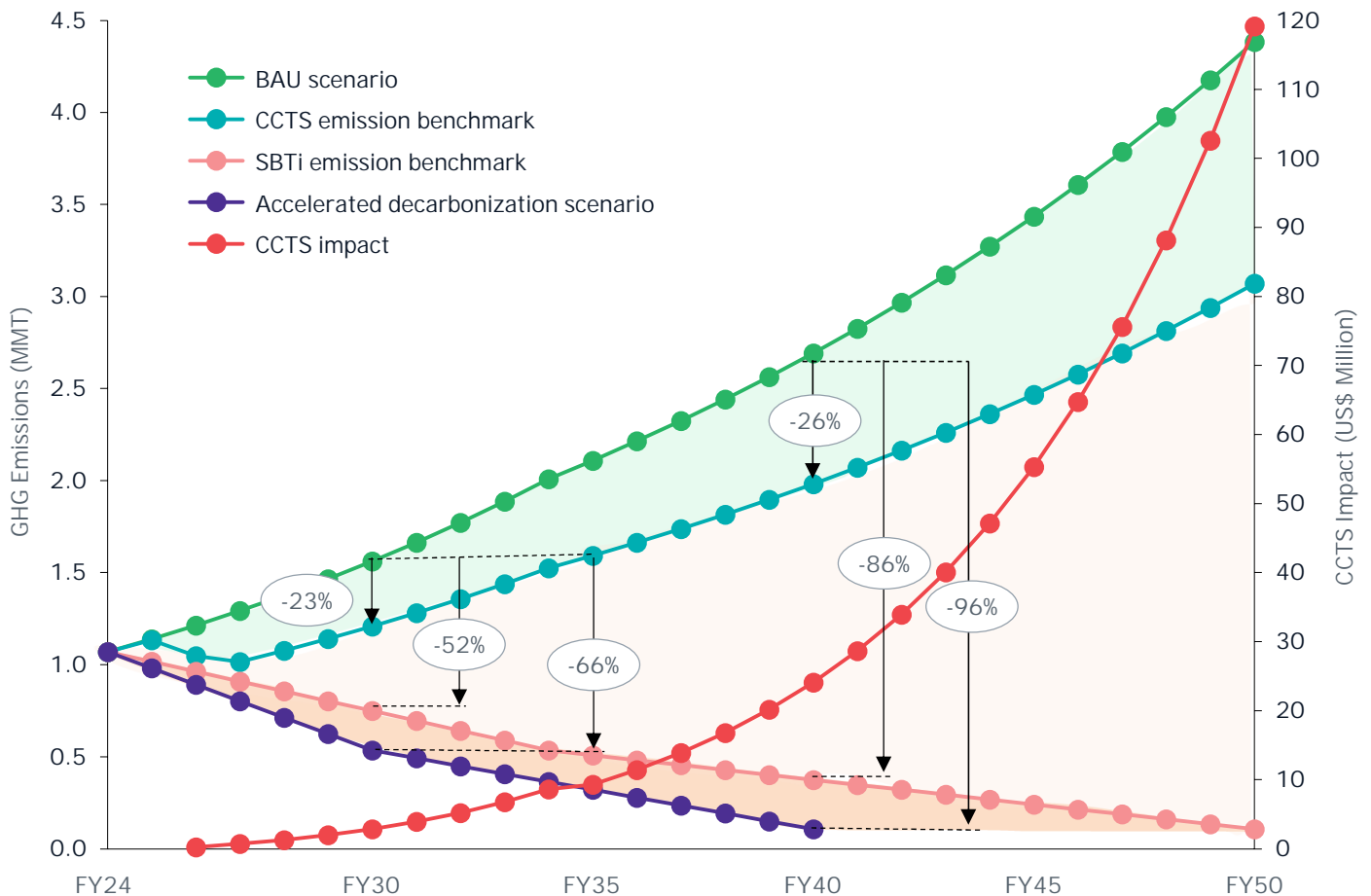
CCTS targets

- Sectoral reduction target
 - An average 4% to 9% reduction in emission intensity over the baseline during the compliance period would translate to ~750 KT reduction of CO₂e by FY27 (assuming constant installed capacity as per FY 2023-2024).
 - During the compliance period, based on the production forecast, there is a potential net increase of ~240 KT of CO₂e emissions.

Source: EY-Parthenon Analysis

Case study: A leading paper & pulp company should begin decarbonizing its assets to avoid CCTS penalties on a 23% to 26% emissions gap from BAU

Emission scenarios with CCTS/ SBTi mandates and cost saving potential



Note:

1. SBTi targets are aligned as per 1.5 Degree scenario with long term target of 50% emission reduction in 10 years and net zero by 2050
2. Accelerated decarbonization scenario targets 50% emission reduction by 2030 and net zero by 2040
3. The paper and pulp sector is projected to grow at 6.5% annually until FY 2035, after which the growth rate is expected to stabilize at 5% in the long term

The company would have to pay for these emissions in CCTS scheme in case of BAU scenario (eg: if company does not decarbonize)

The company would have an emission differential of 52% by 2030 and 86% by 2040 if compared with SBTi targets

The company would have an emission differential of 66% by 2030 and 96% by 2040 if compared with Accelerated Decarbonization targets

- The company would have to pay for the excess emissions above CCTS benchmark
- The CCTS penalty will differ as the growth rate increases and CCTS benchmark decreases if the company does not decarbonize

- Since the SBTi line is below CCTS emission benchmark, adherence to the same and having an accelerated decarbonization journey can help the company avoid CCTS penalties

Source: EY-Parthenon Analysis

Normative carbon pricing: The company is expected to incur a financial implication of ~INR 23-29 crores from 2026 to 2030 due to the impact of CCTS, if no decarbonization is undertaken

Sensitivity Analysis highlighting financial impact FY 26-30 (cr.)

Sensitivity table	Production growth scenario	No Growth	Pessimistic	Normative (<i>paper and pulp growth</i>)	Optimistic
CCTS industry benchmark scenario	%	0%	4%	6%	8%
As-is (Present)	As per BEE Gazette	17-23	21-27	23-29	25-31
Industry weighted average	Average of all plants (category wise) (in terms of GEI)	26-32	31-38	33-39	36-42
Pessimistic (stricter targets)	-5% (GEI target lower Industry weighted avg)	32-38	38-44	41-47	44-50
Optimistic (lenient targets)	+5% (GEI target higher than industry weighted avg)	20-26	24-30	26-32	28-34

Source: EY-Parthenon Analysis



Insights

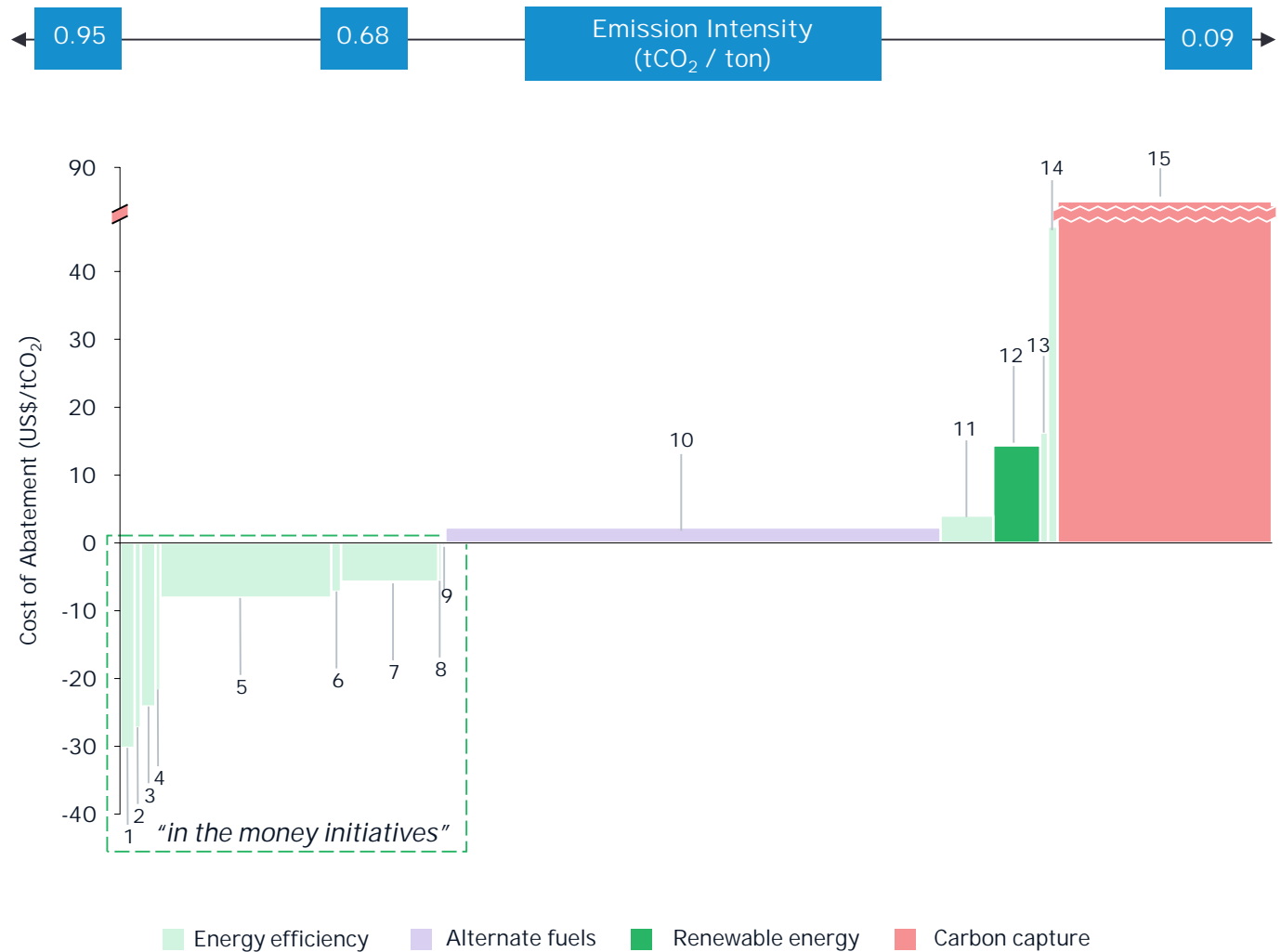
- In the BAU scenario, taking into account a 6% industry growth rate for the paper and pulp industry, the company is projected to experience a financial impact of INR24-29 crore from 2026 to 2030, considering the carbon price at US\$10 per ton of CO2 equivalent.
- The costs in the table represent the cost of not decarbonizing for the company.

Assumptions:

- Three plants of the company have been considered for analysis in this table (taken directly from the Gol Gazette by BEE).
- The financial impact is calculated cumulatively from 2025 to 2030. The net present value of the impact has been mentioned in the table.
- A carbon price scenario with a normative pricing of US\$10 has been taken into account for the analysis
- Production growth scenarios have been built basis the paper and pulp sector trends in India.
- The "Industry Weighted Average" for GHG emission intensity has been considered for scenario analysis.
- The CCTS benchmark sensitivity scenarios have been built basis +5% and -5% of the "Industry Weighted Average" intensity benchmark.

Source: EY-Parthenon Analysis

Substituting coal with biomass in the paper and pulp industry is the biggest lever to abate emissions associated with thermal energy, followed by energy efficiency measures



1. Pumping optimization	4. Vacuum system optimization	7. Heat recovery	10. 60% coal subt. With biomass	13. Efficient refiners
2. Advanced process control	5. Enclosed paper machine hoods	8. Efficient rotors	11. Shoe press	14. Gap forming
3. Turbo fans in vacuum system	6. Usage of thermo-compressors	9. Efficient screening	12. 100% renewable electricity	15. Carbon capture

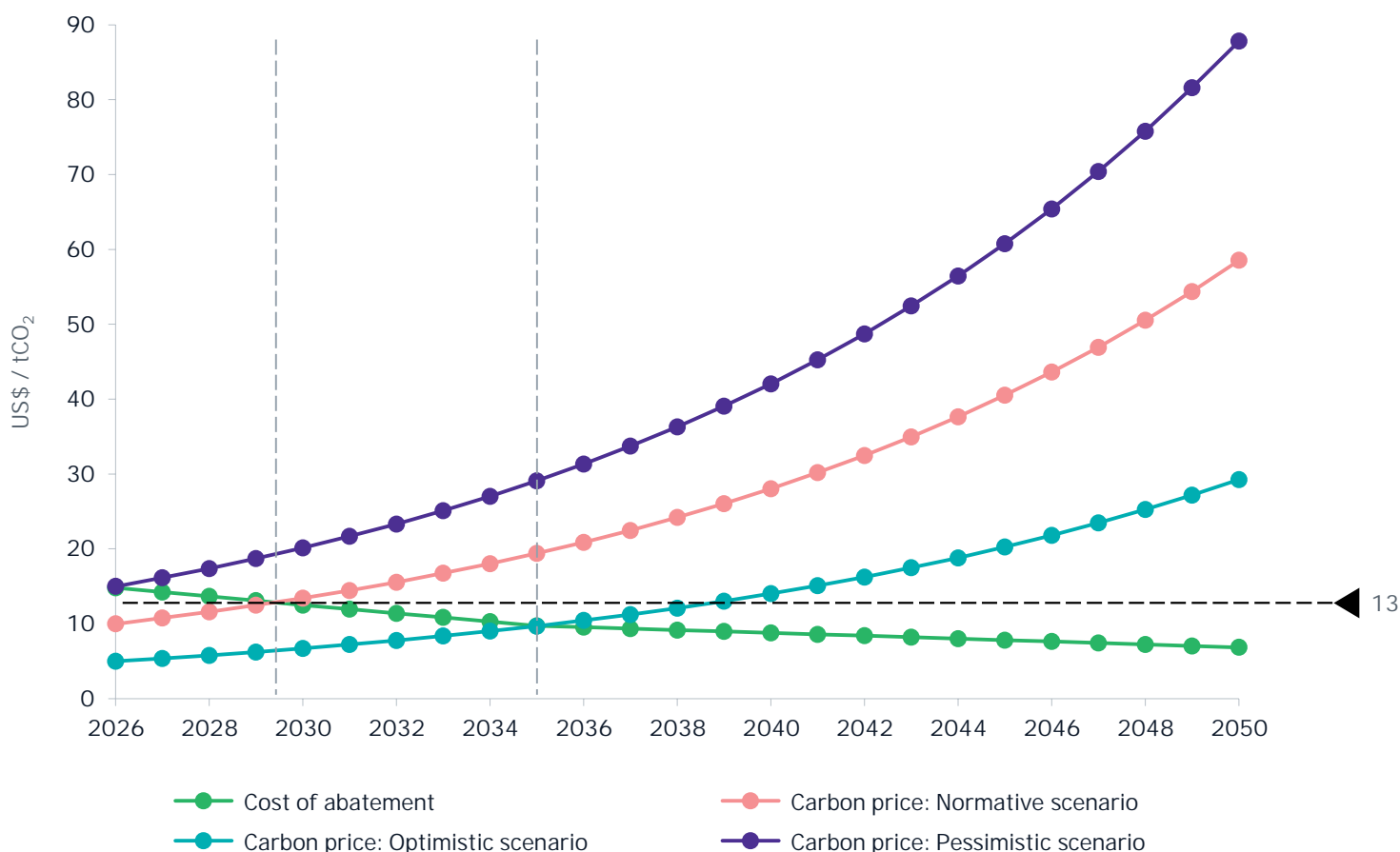
Note:

1. The decarbonization levers is identified for the RCF (Recycled) paper making process which is the major paper production pathway in India
2. Carbon capture costs includes capturing CO₂ from source, and excludes the fate of captured CO₂ for storage/utilization.
3. The analysis considers specific power consumption of 535 kWh/t paper from coal fired captive power plant; 2.52 t steam/t paper consumption from coal fired boilers. Analysis is normalized for 0.95 tCO₂ /t paper

Source: EY-Parthenon Analysis

The Indian paper and pulp sector may start investing in decarbonization technologies now, as the cost of abatement is projected to drop below Indian carbon prices in the next four years

Indian Pulp & Paper Industry: Cost of Abatement v/s Carbon Prices



Insights

- By abating CO₂ emissions at a cost lower than the carbon price, the paper and pulp industry may realize significant cost savings by overcoming the higher costs tied to carbon prices.
- In a normative scenario, it is projected that by the year 2029, the cost of decarbonization will drop below US\$15/tCO₂. Concurrently, carbon prices in India are expected to rise above this level.
- As the technologies scale further and mature in the upcoming years, the cost of decarbonization decreases further, leading to quicker incentivization for the paper and pulp industry.

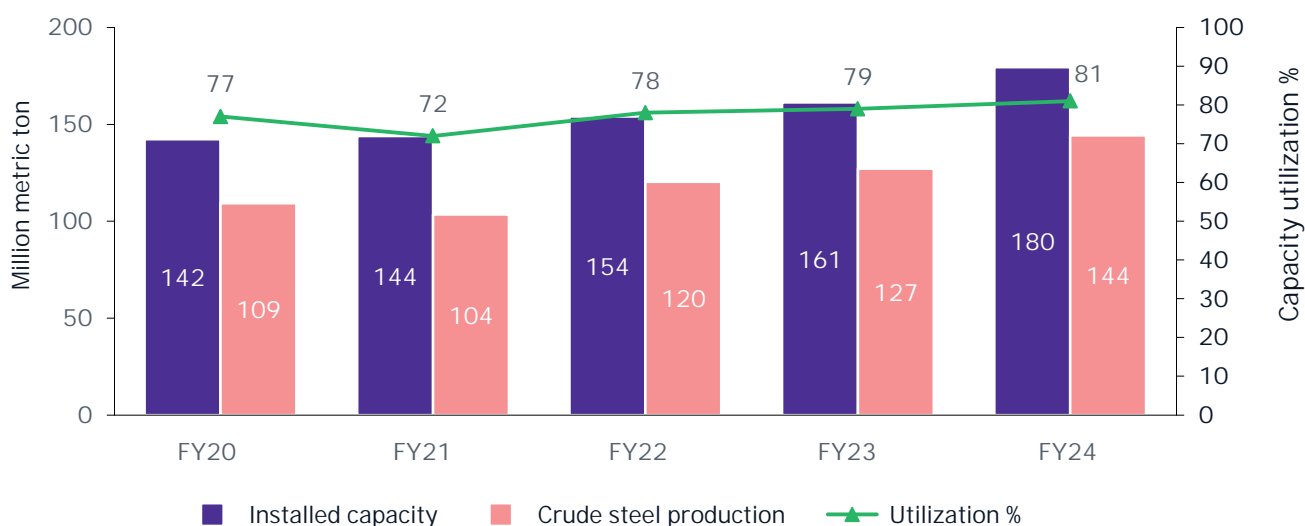
Assumptions:

- A carbon price scenario with a normative pricing of US\$10/tCO₂ in 2026 has been taken into account for the analysis.
- In pessimistic and optimistic scenarios, the carbon price starts at US\$15 and US\$5, respectively.
- All identified decarbonization levers are considered at once to plot the blended cost of abatement in each year.

Source: EY-Parthenon Analysis

Globally, India is the second-largest producer of crude steel and is on track to achieve 255 MMT production by FY31

India's Iron and Steel industry trend (MMT)



Highlights

- India aims to reach 300 MMT installed capacity by FY31 under the National Steel Policy.
- Domestic steel demand is growing at 9%-10% Y-o-Y, led by end-use sectors like automotive, infrastructure and construction sectors.
- The PLI Scheme expected to add 26 MMT of specialty capacity, INR42,500 crore investment.
- India has developed a Green Steel Taxonomy to standardize definitions.
 - The emission intensity reduction targets for the companies fall in the range of 4% to 9% over the baseline during the compliance period.
 - This would translate to ~19.5 MMT reduction of CO₂e by FY27 (assuming constant installed capacity as per FY 2023-2024).

Parameters

Description

Global Steel Production (2024)	1,882 million metric tons
India's global rank in steel production	2 nd
Global crude steel EI	1.92 tCO ₂ per ton crude steel
India's crude steel EI	2.55 tCO ₂ per ton crude steel

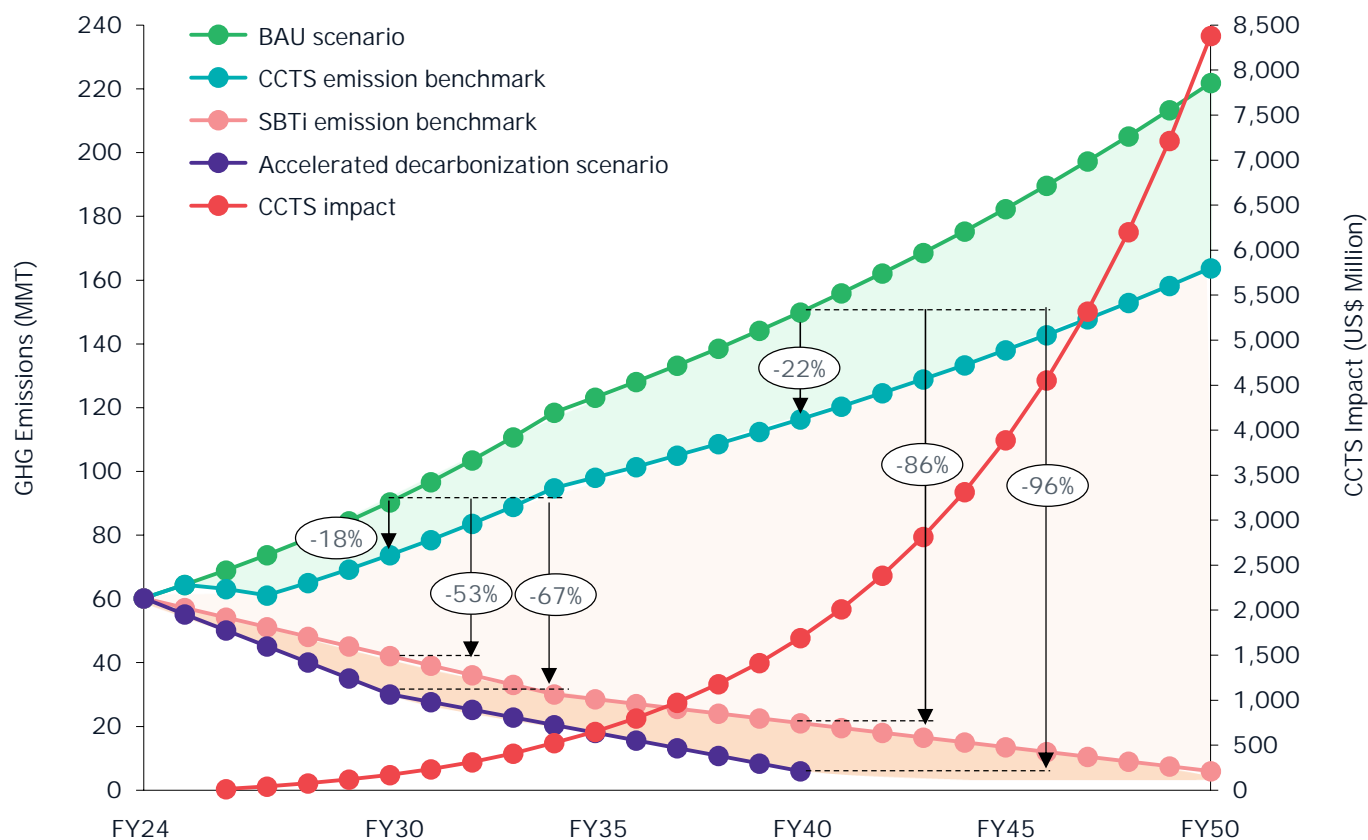
CCTS targets

- Sectoral Reduction target
 - The emission intensity reduction targets for the companies fall in the range of 4% to 9% over the baseline during the compliance period
 - This would translate to ~19.5 MMT reduction of CO₂e by FY27 (assuming constant installed capacity as per FY 2023-2024)

Source: EY-Parthenon Analysis

Case study: A major iron and steel company should start decarbonizing its assets to avoid CCTS penalties on 18% to 22% emissions differential from BAU

Emission scenarios with CCTS/ SBTi mandates and cost saving potential



Source: EY-Parthenon Analysis

Note:

- SBTi targets are aligned as per 1.5 Degree scenario with long term target of 50% emission reduction in 10 years and net zero by 2050
- Accelerated decarbonization scenario targets 50% emission reduction by 2030 and net zero by 2040
- The iron and steel sector is projected to grow at 7% annually until FY 2035, after which the growth rate is expected to stabilize at 5% in the long term

The company would have to pay for these emissions in CCTS scheme in case of BAU scenario (eg: if company does not decarbonize)

The company would have an emission differential of 53% by 2030 and 86% by 2040 if compared with SBTi targets

The company would have an emission differential of 67% by 2030 and 96% by 2040 if compared with Accelerated Decarbonization targets

- The company would have to pay for the excess emissions above CCTS benchmark
- The CCTS penalty will differ as the growth rate increases and CCTS benchmark decreases if the company does not decarbonize

- Since the SBTi line is below CCTS emission benchmark, adherence to the same and having an accelerated decarbonization journey can help the company avoid CCTS penalties

Normative carbon pricing: The company is expected to incur a financial implication of INR3010-3016 crore from 2026 to 2030 due to the impact of CCTS if no decarbonization is undertaken

Sensitivity Analysis highlighting financial impact FY 26-30 (cr.)

Sensitivity Table	Production growth scenario	No Growth	Pessimistic	Normative (iron and steel growth)	Optimistic
CCTS Industry Benchmark scenario	%	0%	5%	7%	9%
As-is (Present)	As per BEE Gazette	2173-2179	2747-2753	3010-3016	3295-3301
Industry Weighted Average	Average of all plants (category wise) (in terms of GEI)	3600-3606	4457-4463	4846-4852	5266-5272
Pessimistic (stricter targets)	-5% (GEI target lower Industry weighted avg)	4665-4671	5758-5764	6254-6260	6876-6882
Optimistic (lenient targets)	+5% (GEI target higher than Industry weighted avg)	2537-2543	3158-3164	3441-3447	3746-3752



Insights

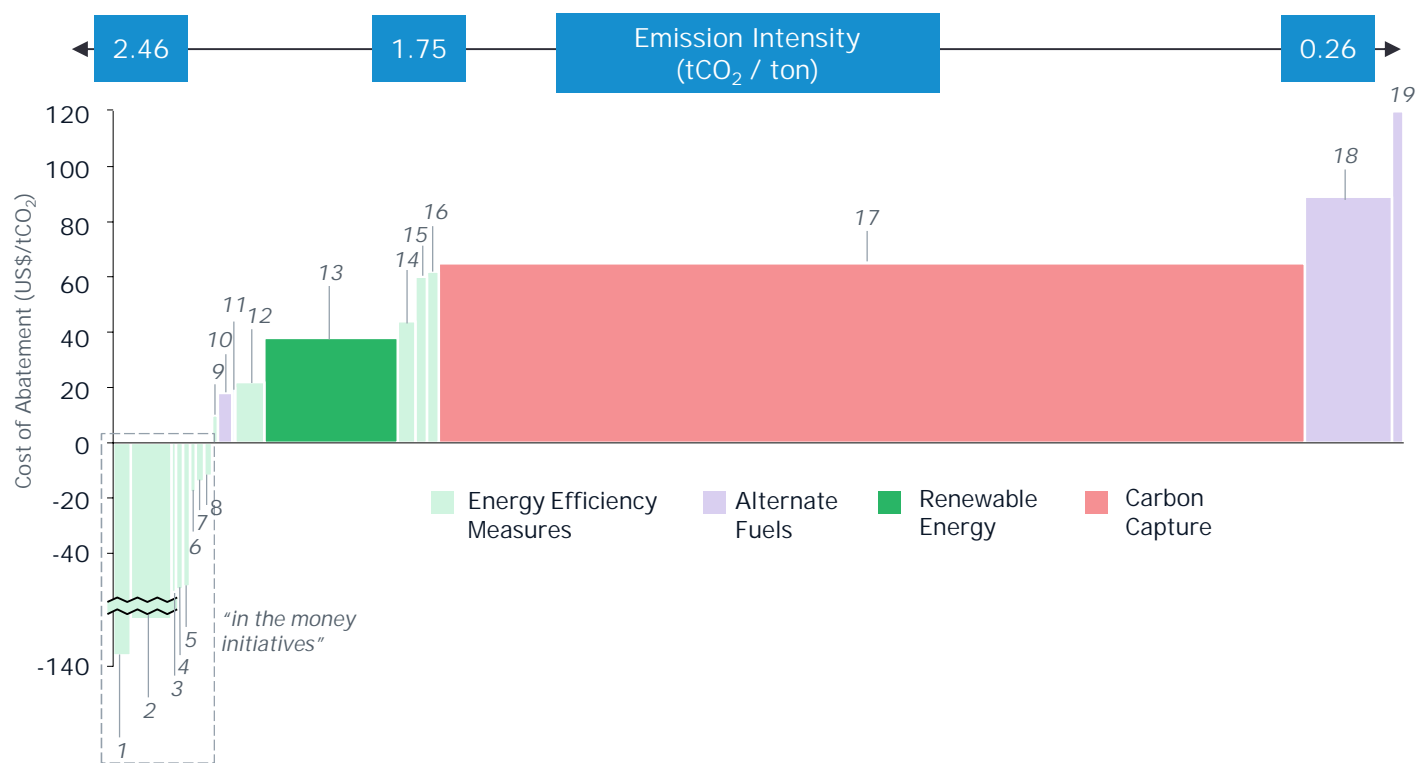
- In the BAU scenario, taking into account a 7% industry growth rate for the iron and steel industry, the company is projected to experience a financial impact of INR3,010-3,016 crore from 2026 to 2030, considering the carbon price at US\$10 per ton of CO₂eq
- The costs in the table represent the cost of not decarbonizing for the company plants

Assumptions:

- Three plants of the company have been considered for analysis in this table (taken directly from the GoI Gazette by BEE)
- The financial impact is calculated cumulatively from 2025 to 2030. The net present value of the impact has been mentioned in the table.
- A carbon price scenario with normative pricing of US\$10 has been taken into account for the analysis
- Production growth scenarios have been built basis the iron and steel sector trends in India.
- The "Industry Weighted Average" for GHG emission intensity has been considered for scenario analysis
- The CCTS benchmark sensitivity scenarios have been built basis +5% and -5% of the "Industry Weighted Average" intensity benchmark.

Source: EY-Parthenon Analysis

Carbon capture is the most crucial lever to abate emissions associated in BF-BOF steelmaking process in India, followed by energy efficiency measures



1. Increasing PCI rate	5. Stove sensible heat recovery	9. BOF gas: sensible heat recovery	13. Renewable energy	17. Carbon capture
2. COG use	6. Variable speed drives	10. Biomass injection	14. TRT	18. NG injection in BF
3. Increasing sinter burner efficiency	7. Cogeneration	11. Cmc	15. Sinter cooler heat recovery	19. GH2 injection in BF
4. Energy monitoring system	8. Preventive maintenance	12. Cdq	16. Slag heat recovery	

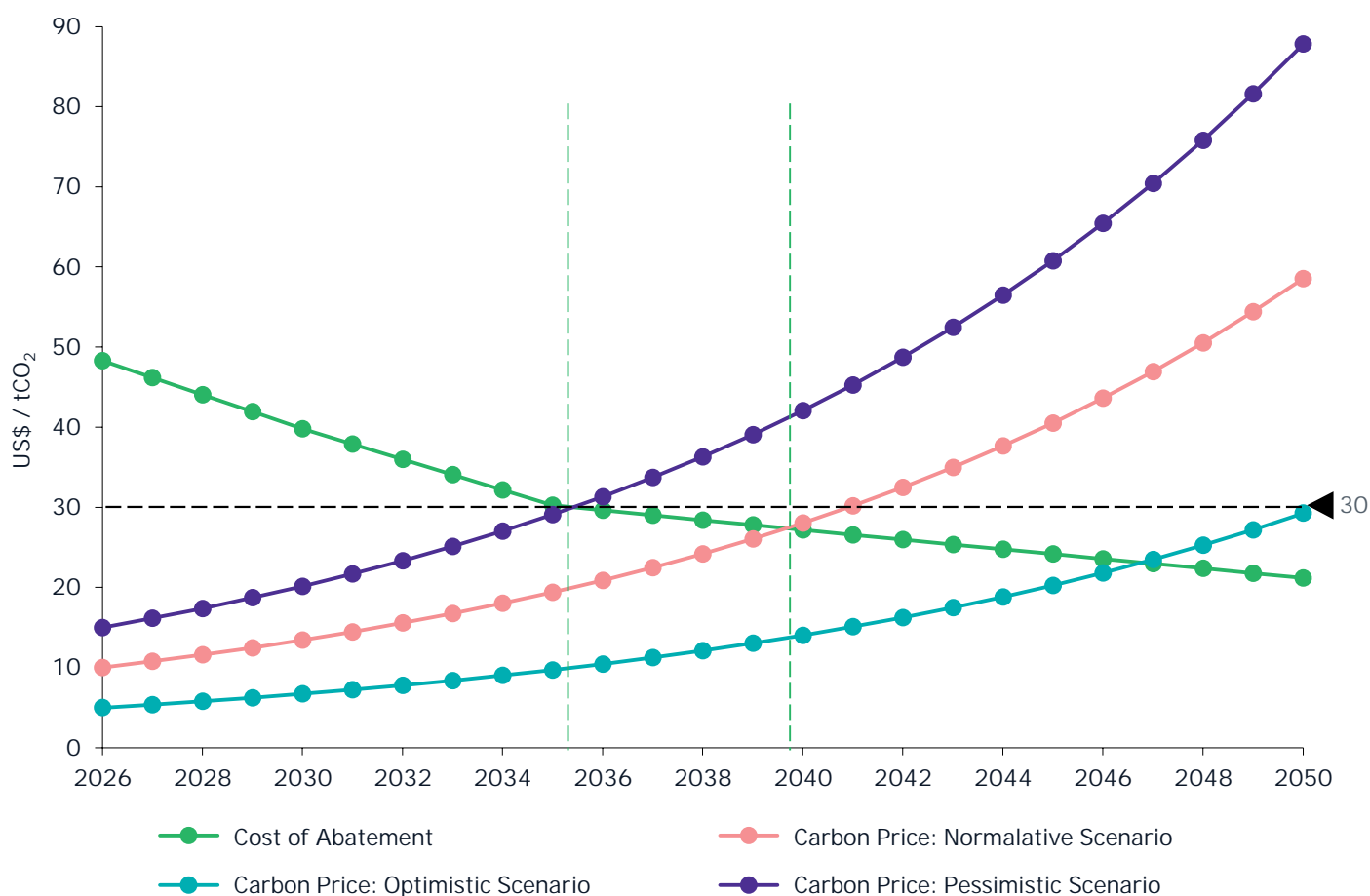
Note:

- Carbon capture costs includes capturing CO₂ from source, and excludes the fate of captured CO₂ for storage/utilization.

Source: CEEW, EYP Analysis

The Indian iron and steel industry may start investing in decarbonization technologies now, as the cost of abatement is projected to fall below Indian carbon prices by the next decade

Indian iron and steel (BF-BOF): Cost of abatement vs. carbon prices



Insights

- By abating CO₂ emissions at a cost lower than the carbon price, the iron and steel industry may realize significant cost savings by overcoming the higher costs tied to carbon prices.
- In a pessimistic scenario, it is projected that by the year 2035, the cost of decarbonization will drop below US\$30/tCO₂. Concurrently, carbon prices in India are expected to rise above this level.
- As the technologies scale further and matures in upcoming years, the cost of decarbonization decreases further, leading to quicker incentivization for the iron and steel industry.

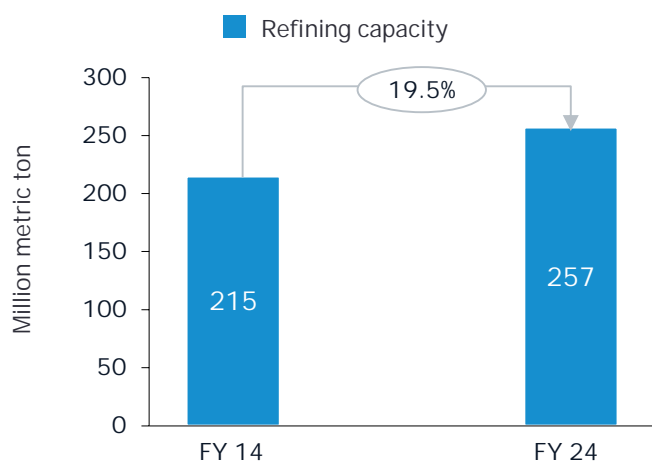
Assumptions:

- A carbon price scenario with a normative pricing of \$10/tCO₂ in 2026 has been taken into account for the analysis.
- In pessimistic and optimistic scenario, carbon price starts at \$15 & \$5 respectively
- All identified decarbonization levers are considered at once to plot the blended cost of abatement in each year

Source: EY-Parthenon Analysis

India's refinery sector is the fourth largest in the world, with an installed capacity of 257 MMTPA, which is projected to grow to 310 MMTPA by 2028 driven by rising energy demand

India's refinery sector trend (MMTPA)



Highlights

- India's refining capacity has grown from 215.1 MMTPA to 256.8 MMTPA over the past decade.
- As the world's fourth-largest crude oil refiner, India is expected to add approximately one million barrels per day of refining capacity by 2028, taking the refining capacity to 309.5 MMTPA.
- India is the third-largest consumer of crude oil, with a demand of 5.59 million bpd in 2024, reflecting a 4.1% growth over the previous year.
- Oil demand in India is projected to register a twofold growth, reaching one million barrels by 2045.
- India aims to nearly double its refining capacity to 450 to 500 million tons by 2030, in line with the growing oil demand.

Parameters

Description

No of refineries	23
Combined capacity	257 MMTPA
India's global rank in refining capacity	4th
Avg. refining emission intensity	37.3 (tCO ₂ e/MBBLS)

CCTS targets

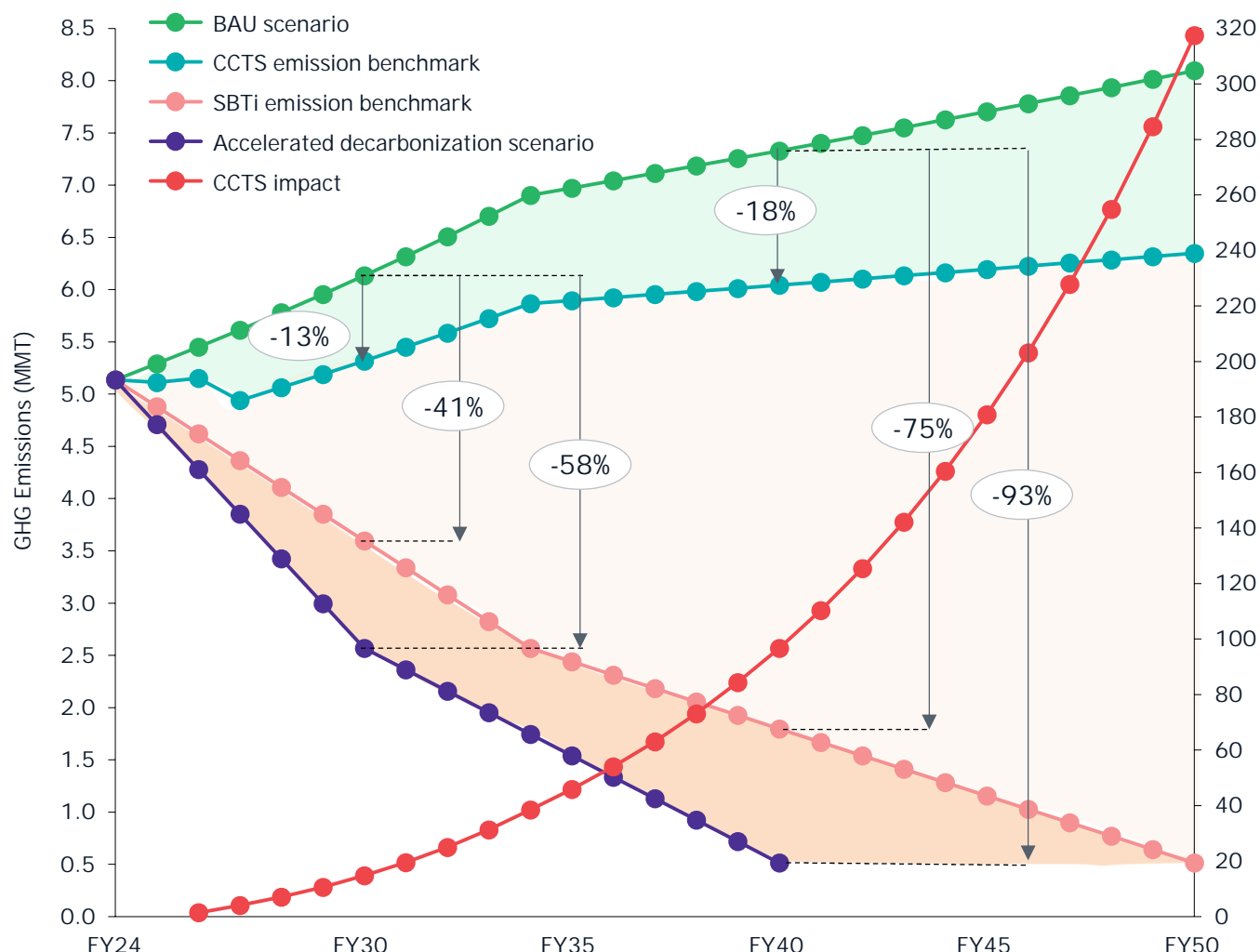
- Sectoral Reduction target**
 - The emission intensity reduction targets for refineries fall in the range of 2% to 6% over the baseline during the compliance period.
 - This would translate to ~3.3 MMT reduction of CO₂e by FY27 (assuming constant installed capacity as per FY 2023-2024).

MBBLS: 1000 barrels

Source: EYP Research, [PIB](#)

Case study: A prominent refinery in India should start decarbonizing its assets to avoid CCTS penalties on 13% to 18% emissions differential from BAU

Emission scenarios with CCTS/ SBTi mandates and cost saving potential



Note:

- SBTi targets are aligned as per 1.5 Degree scenario with long term target of 50% emission reduction in 10 years and net zero by 2050
- Accelerated decarbonization scenario targets 50% emission reduction by 2030 and net zero by 2040
- The refinery sector is projected to grow at 3% annually until FY 2035, after which the growth rate is expected to stabilize at 1% in the long term

The company would have to pay for these emissions in CCTS scheme in case of BAU scenario (eg: if company does not decarbonize)

The company would have an emission differential of 41% by 2030 and 75% by 2040 if compared with SBTi targets

The company would have an emission differential of 58% by 2030 and 93% by 2040 if compared with Accelerated Decarbonization targets

- The company would have to pay for the excess emissions above CCTS benchmark
- The CCTS penalty will differ as the growth rate increases and CCTS benchmark decreases if the company does not decarbonize

- Since the SBTi line is below CCTS emission benchmark, adherence to the same and having an accelerated decarbonization journey can help the company avoid CCTS penalties

MBBLs: 1000 barrels
Source: EY-Parthenon
Analysis

Normative carbon pricing: The company is expected to incur a financial implication of ~INR 272-278 crore from 2026 to 2030 due to the impact of CCTS, if no decarbonization is undertaken

Sensitivity Analysis highlighting financial impact FY 26-30 (INR cr.)

Sensitivity table	Production growth scenario	No Growth	Pessimistic	Normative (<i>refinery growth benchmark</i>)	Optimistic
CCTS industry benchmark scenario	%	0%	1%	3%	5%
As-is (Present)	As per BEE Gazette	235-241	248-254	272-278	299-305
Industry Weighted Average	Average of all plants (category wise) (in terms of GEI)	296-302	310-316	337-343	365-370
Pessimistic (stricter targets)	-5% (GEI target lower Industry weighted avg)	393-399	412-418	447-453	484-490
Optimistic (lenient targets)	+5% (GEI target higher than Industry weighted avg)	199-205	208-214	226-232	246-252



Insights

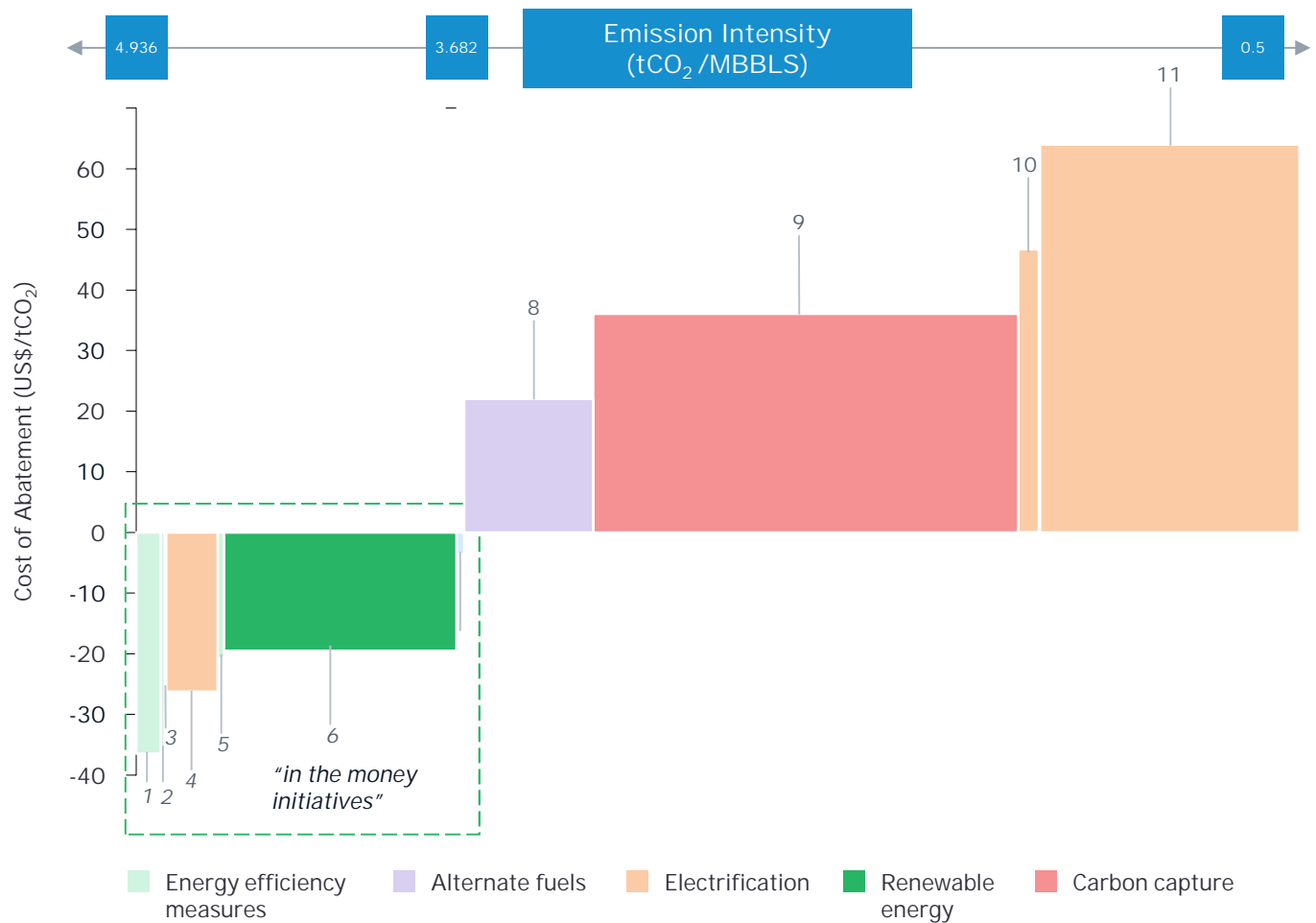
- In the BAU scenario, taking into account a 3% industry growth rate for the refining sector, the company is projected to experience a financial impact of INR272-278 crore from 2026 to 2030, considering the carbon price at US\$10 per ton of CO₂ equivalent.
- The costs in the table represent the cost of not decarbonizing.

Assumptions:

1. Three plants of the company have been considered for analysis in this table (taken directly from the GoI Gazette by BEE).
2. The financial impact is calculated cumulatively from 2025 to 2030. The net present value of the impact has been mentioned in the table.
3. A carbon price scenario with normative pricing of US\$10 has been taken into account for the analysis
4. Production growth scenarios have been built basis the refining sector trends in India.
5. The "Industry Weighted Average" for GHG emission intensity has been considered for scenario analysis.
6. The CCTS benchmark sensitivity scenarios have been built basis +5% and -5% of the "Industry Weighted Average" intensity benchmark.

Source: EY-Parthenon Analysis

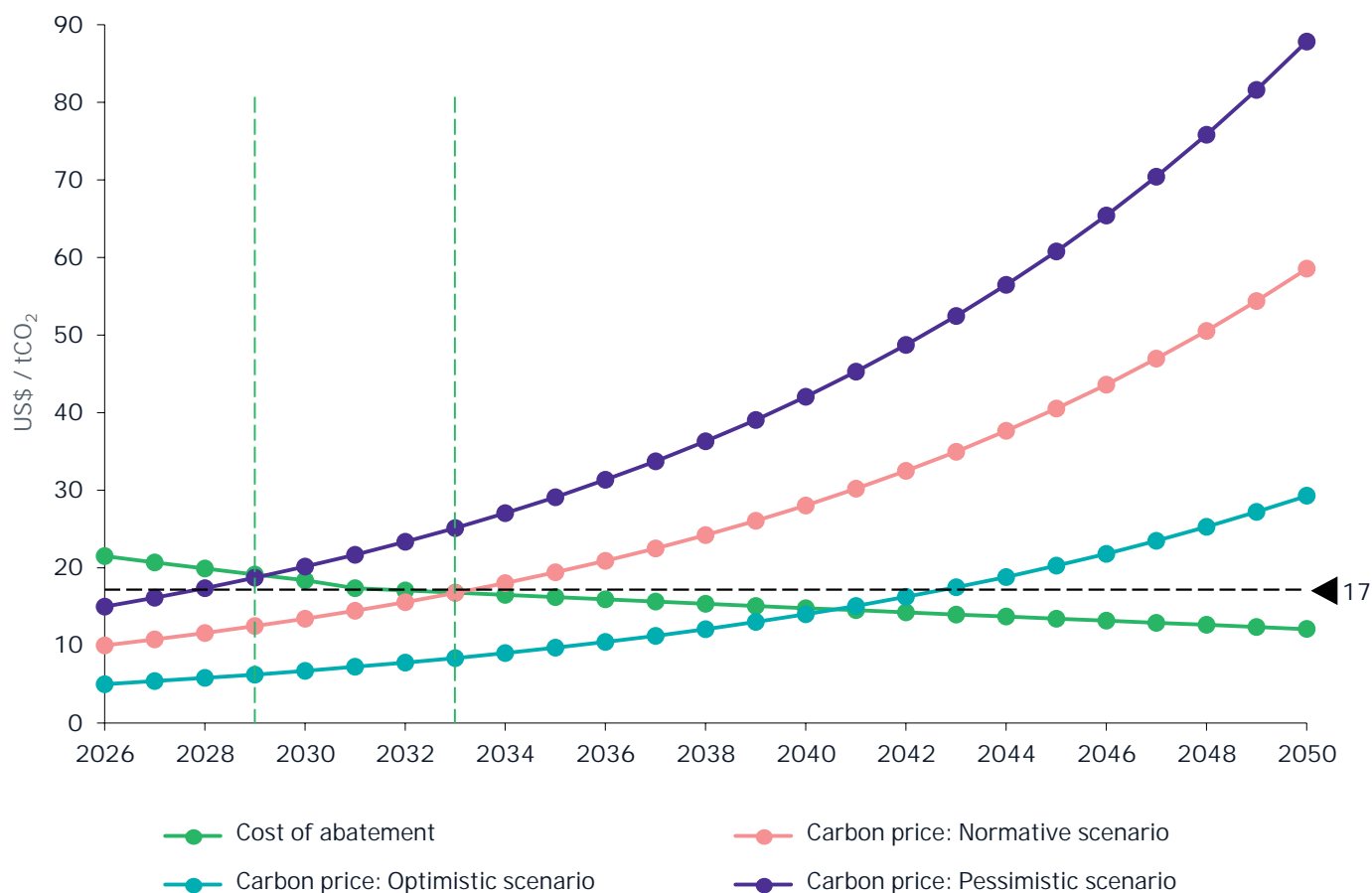
Electrification of boilers and carbon capture are among the most critical levers for decarbonizing the refinery sector, together accounting for approximately 54% of potential emission reductions



1. Heat recovery and integration	4. Drive electrification	7. Power recovery turbine	10. Electrical heat tracing
2. Organic rankine cycle	5. Energy efficient motors	8. Alternate fuel (compressed biogas)	11. Electric boilers
3. Jacketing for insulation	6. RE adoption	9. Carbon capture	

Indian refineries may start investing in decarbonization technologies now, as the cost of abatement is projected to drop below the Indian carbon prices in next 6 to 8 years

Indian Refineries: Cost of Abatement v/s Carbon Prices



Insights

- By abating CO₂ emissions at a cost lower than the carbon price, the refining industry may realize significant cost savings by overcoming the higher costs tied to carbon prices.
- In a normative scenario, it is projected that by the year 2033, the cost of decarbonization will drop below US\$17/tCO₂. Concurrently, carbon prices in India are expected to rise above this level.
- As technologies scale further and mature in the upcoming years, the cost of decarbonization decreases further, leading to quicker incentivization for the industry.

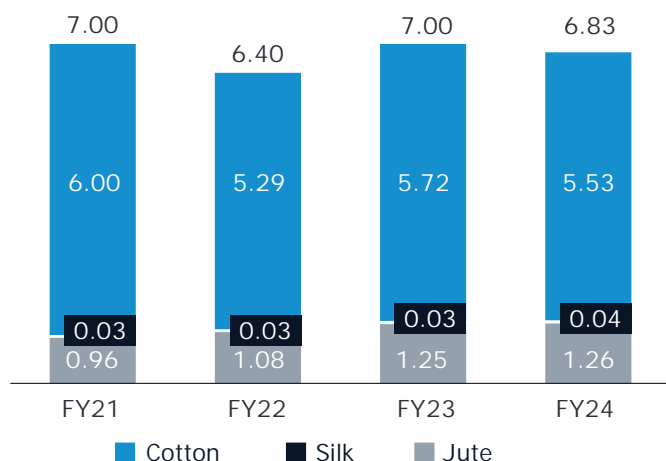
Assumptions:

- A carbon price scenario with normative pricing of US\$10/tCO₂ in 2026 has been taken into account for the analysis.
- In pessimistic and optimistic scenarios, the carbon price starts at US\$15 and US\$5, respectively.
- All identified decarbonization levers are considered at once to plot the blended cost of abatement in each year.

Source: EY-Parthenon Analysis

India is the second-largest textile manufacturer and sixth-largest exporter in the world, with over 3,400 textile mills installed currently

Indian Refineries: Cost of Abatement v/s Carbon Prices



Highlights

- The textiles and apparel industry contributes 2.3% to the country's GDP, 13% to industrial production and 12% to exports.
- The market for Indian textiles and apparel is projected to grow at a 10% CAGR, reaching US\$350 billion by 2030, with exports expected to reach US\$100 billion.
- Cotton production in India is projected to reach 7.2 million metric tons by 2030, driven by increasing demand from consumers.
- The government has approved the establishment of seven PM Mega Integrated Textile Region and Apparel (PM MITRA) parks in greenfield/brownfield sites, with an outlay of INR4445 crore for a period of seven years up to 2027-28.

Parameters	Description
No of textile mills	3400+
Domestic textile and apparel production	US\$ 175.7 Bn
Exports value	US\$ 35.87 Bn

CCTS targets

- Sectoral Reduction target
 - Emission intensity targets vary across sub-sectors, but on average, a 4%-12% reduction from the baseline will be required during the compliance period.
 - This would translate to ~1.6 MMT reduction of CO₂ e by FY27 (assuming constant installed capacity as per FY 2023-2024).

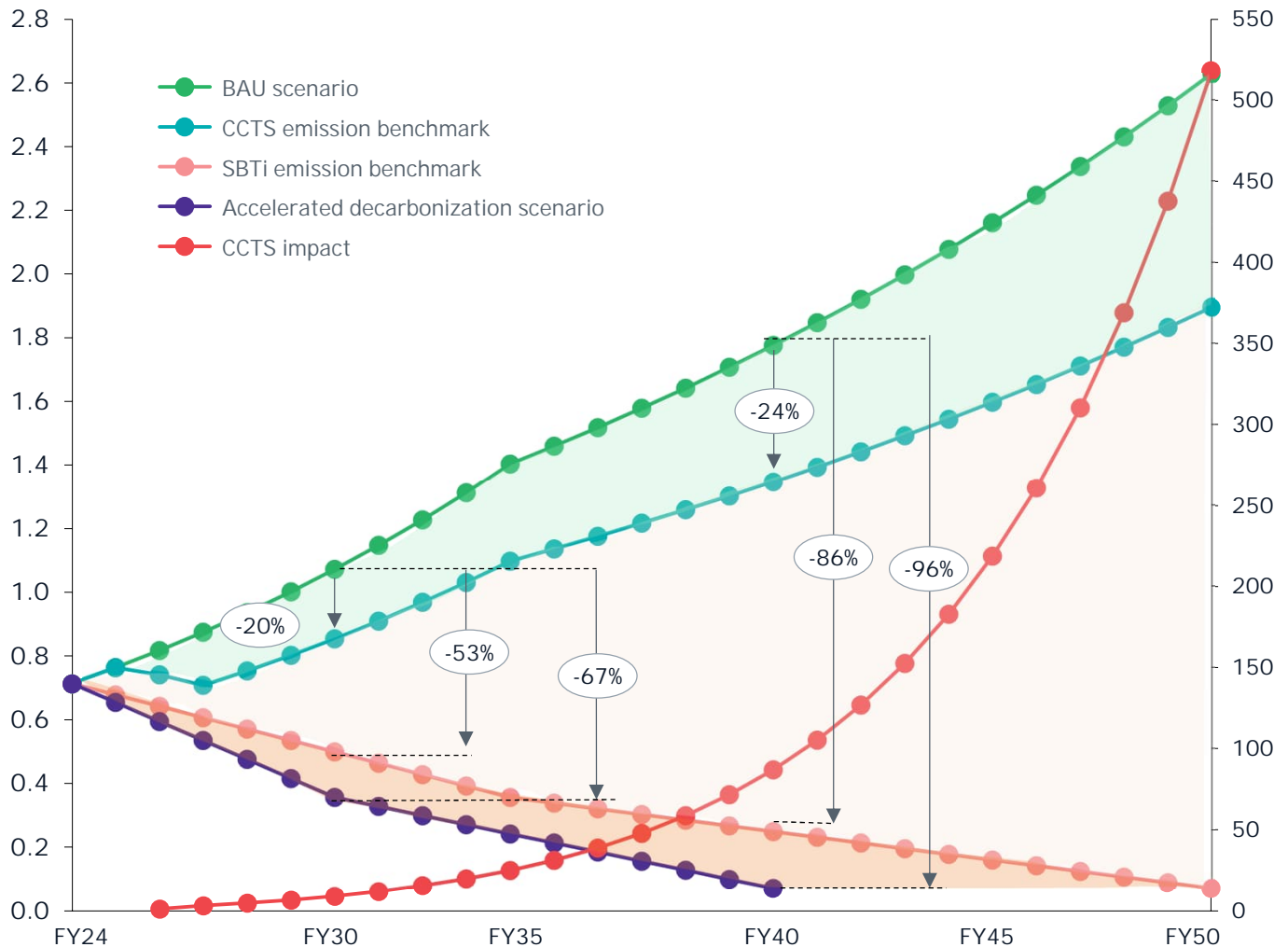
MBBLS: 1000 barrels

Source: EYP Research, [Cotton production](#), [Silk production](#), [Jute production](#)



Case study: A textile company with should start decarbonizing its assets to avoid CCTS penalties on 20%-24% emissions differential from BAU

Emission scenarios with CCTS/ SBTi mandates and cost saving potential



Source: EY-Parthenon Analysis

Note:

1. SBTi targets are aligned as per 1.5 Degree scenario with long term target of 50% emission reduction in 10 years and net zero by 2050
2. Accelerated decarbonization scenario targets 50% emission reduction by 2030 and net zero by 2040
3. The textile sector is projected to grow at 7% annually until FY 2035, after which the growth rate is expected to stabilize at 5% in the long term

The company would have to pay for these emissions in CCTS scheme in case of BAU scenario (eg: if company does not decarbonize)

The company would have an emission differential of 53% by 2030 and 86% by 2040 if compared with SBTi targets

The company would have an emission differential of 67% by 2030 and 96% by 2040 if compared with Accelerated Decarbonization targets

- The company would have to pay for the excess emissions above CCTS benchmark
- The CCTS penalty will differ as the growth rate increases and CCTS benchmark decreases if the company does not decarbonize

- Since the SBTi line is below CCTS emission benchmark, adherence to the same and having an accelerated decarbonization journey can help the company avoid CCTS penalties

Normative carbon pricing: The company is expected to incur a financial implication of ~INR53-59 crore from 2026 to 2030 due to the impact of CCTS if no decarbonization is undertaken

Sensitivity Analysis highlighting financial impact FY 26-30 (cr.)

Sensitivity Table	Production growth scenario	No Growth	Pessimistic	Normative (<i>textile growth benchmark</i>)	Optimistic
CCTS industry benchmark scenario	%	0	6%	8%	10%
As-is (Present)	As per BEE Gazette	36-42	48-54	53-59	58-64
Industry Weighted Average	Average of all plants (category wise) (in terms of GEI)	47-53	61-67	67-73	73-79
Pessimistic (stricter targets)	-5% (GEI target lower Industry weighted avg)	60-66	78-84	85-91	92-98
Optimistic (lenient targets)	+5% (GEI target higher than Industry weighted avg)	34-40	45-51	49-54	54-60



Insights

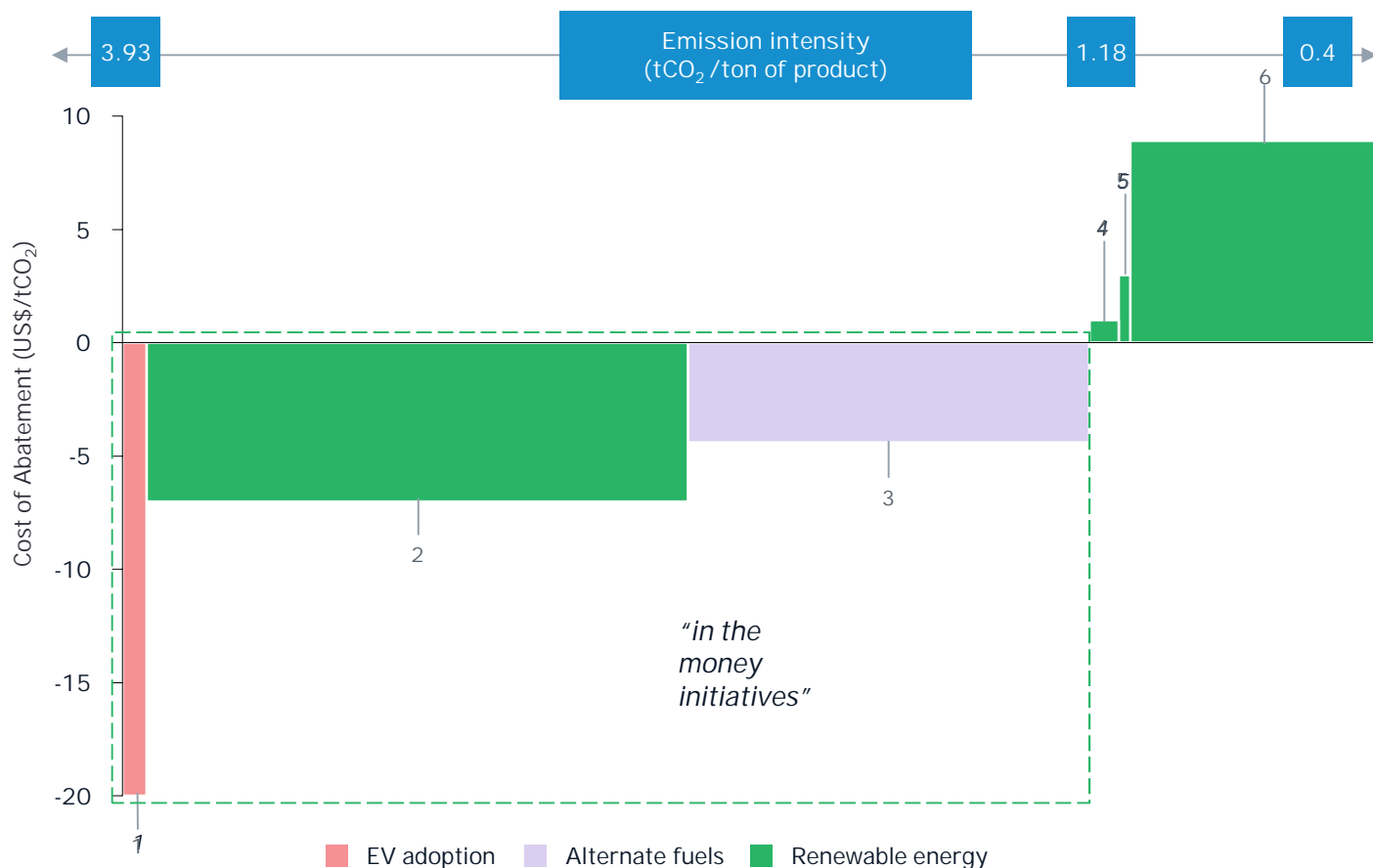
- In the BAU scenario, taking into account an 8% industry growth rate for the textile industry, the company is projected to experience a financial impact of INR53-59 crore from 2026 to 2030, considering the carbon price at US\$10 per ton of CO₂eq.
- The costs in the table represent the cost of not decarbonizing for the company.

Assumptions:

- Eight plants of the company have been considered for analysis in this table (taken directly from the GoI Gazette by BEE).
- The financial impact is calculated cumulatively from 2026 to 2030. The net present value of the impact has been mentioned in the table.
- A carbon price scenario with a normative pricing of US\$10 has been taken into account for the analysis.
- Production growth scenarios have been built basis the textile sector trends in India.
- The "Industry Weighted Average" for GHG emission intensity has been considered for scenario analysis.
- The CCTS benchmark sensitivity scenarios have been built basis +5% and -5% of the "Industry Weighted Average" intensity benchmark.

Source: EY-Parthenon Analysis

Renewable energy and alternate fuels are the most critical levers for decarbonizing the textile sector, together accounting for approximately ~90% of potential emission reductions

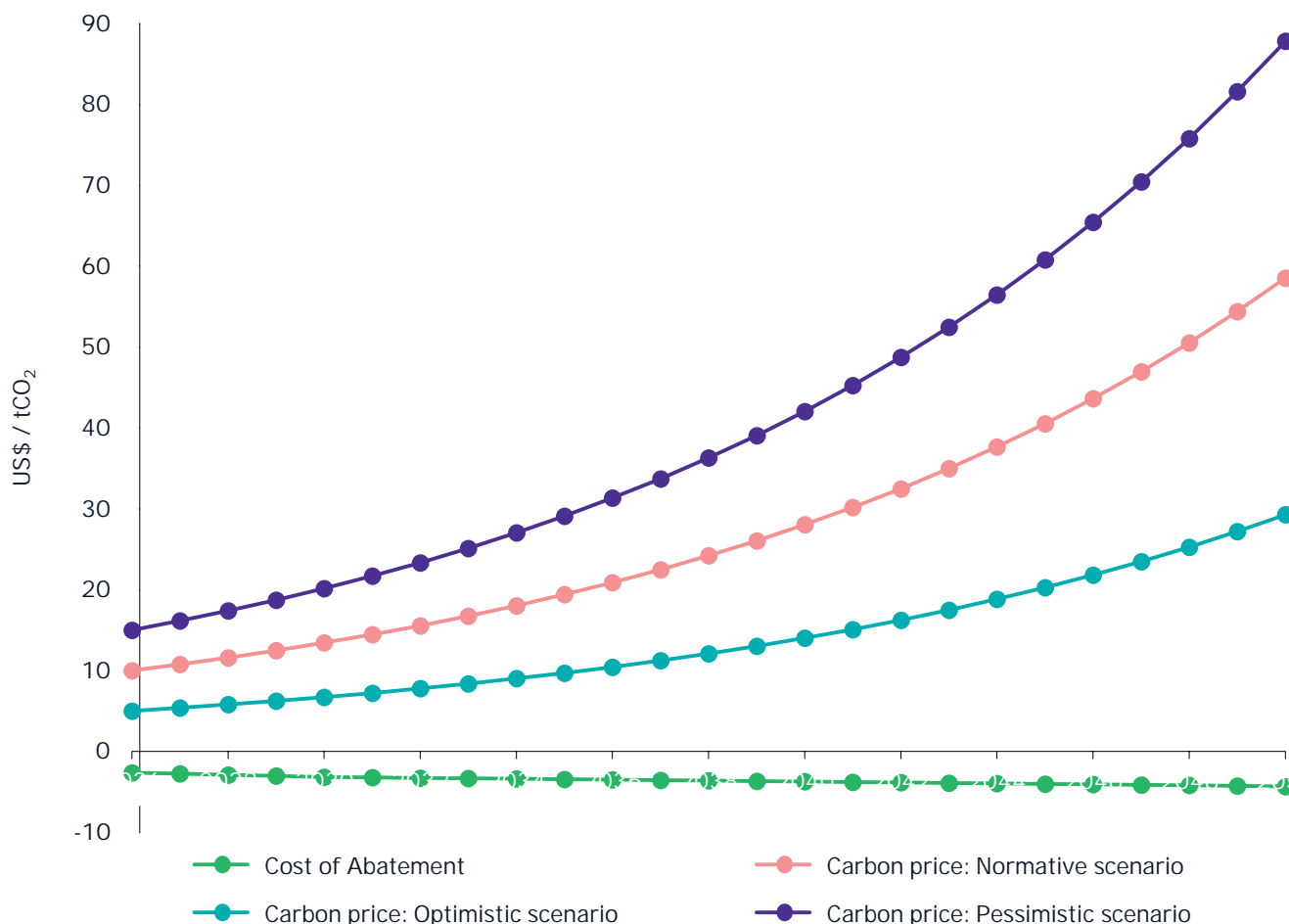


1. Fleet and MHE electrification	3. Coal replacement with biomass in CPP	5. Purchase of green power
2. RE (rooftop + open access)	4. Purchase of renewable energy certificates	6. Battery energy storage system (BESS)

Source: EY-Parthenon Analysis

The textile sector should start investing in decarbonization technologies now, as the current abatement cost of – 2.6US\$/tCO₂e indicates that emission reductions already deliver cost savings

Indian Refineries: Cost of Abatement v/s Carbon Prices



Insights

- The textile industry can achieve significant cost savings by abating CO₂ emissions at a cost lower than the carbon price, reducing exposure to carbon pricing.
- Currently, the cost of abatement stands at ~2.6 US\$/tCO₂e, driven by significant emission reductions through RE adoption and alternative fuels, both of which are “in the money” initiatives.
- This suggests the industry should act now to capture savings of 2.6US\$ per ton of CO₂, with further cost reductions expected as technologies mature.

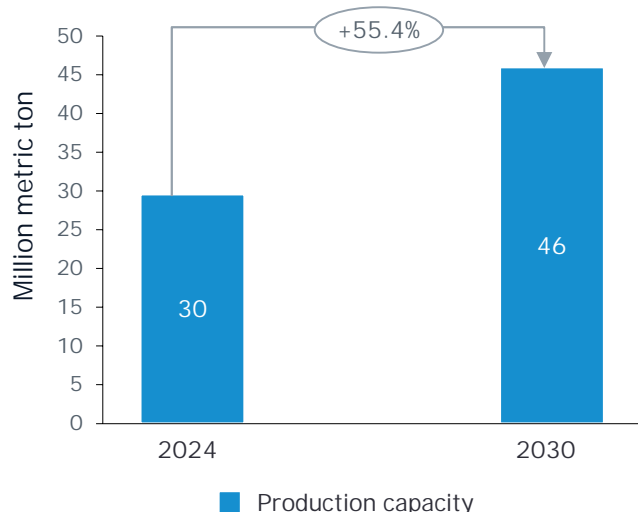
Assumptions:

1. A carbon price scenario with a normative pricing of US\$10/tCO₂ in 2026 has been taken into account for the analysis.
2. In pessimistic and optimistic scenarios, the carbon price starts at US\$15 and US\$5, respectively.
3. All identified decarbonization levers are considered at once to plot the blended cost of abatement in each year.

Source: EY-Parthenon Analysis

India's petrochemical sector is set for rapid growth, with capacity rising from 29.6 MMTPA to 46 MMTPA by 2030, US\$87 billion in planned investments, and a projected US\$1 trillion valuation by 2040

India's petrochemical sector trend (MMTPA)



Highlights

- The textile industry can achieve significant cost savings by abating CO₂ emissions at a cost lower than the carbon price, reducing exposure to carbon pricing.
- Currently, the cost of abatement stands at ~2.6 US\$/tCO₂e, driven by significant emission reductions through RE adoption and alternative fuels, both of which are "in the money" initiatives.
- This suggests the industry should act now to capture savings of 2.6US\$ per ton of CO₂, with further cost reductions expected as technologies mature.

Parameters

Description

Production capacity	~29.6 MMTPA
India's rank in chemical and petrochemical production	6th
Petrochemical emission intensity	0.9795 (tCO ₂ e/ton of product)

CCTS targets

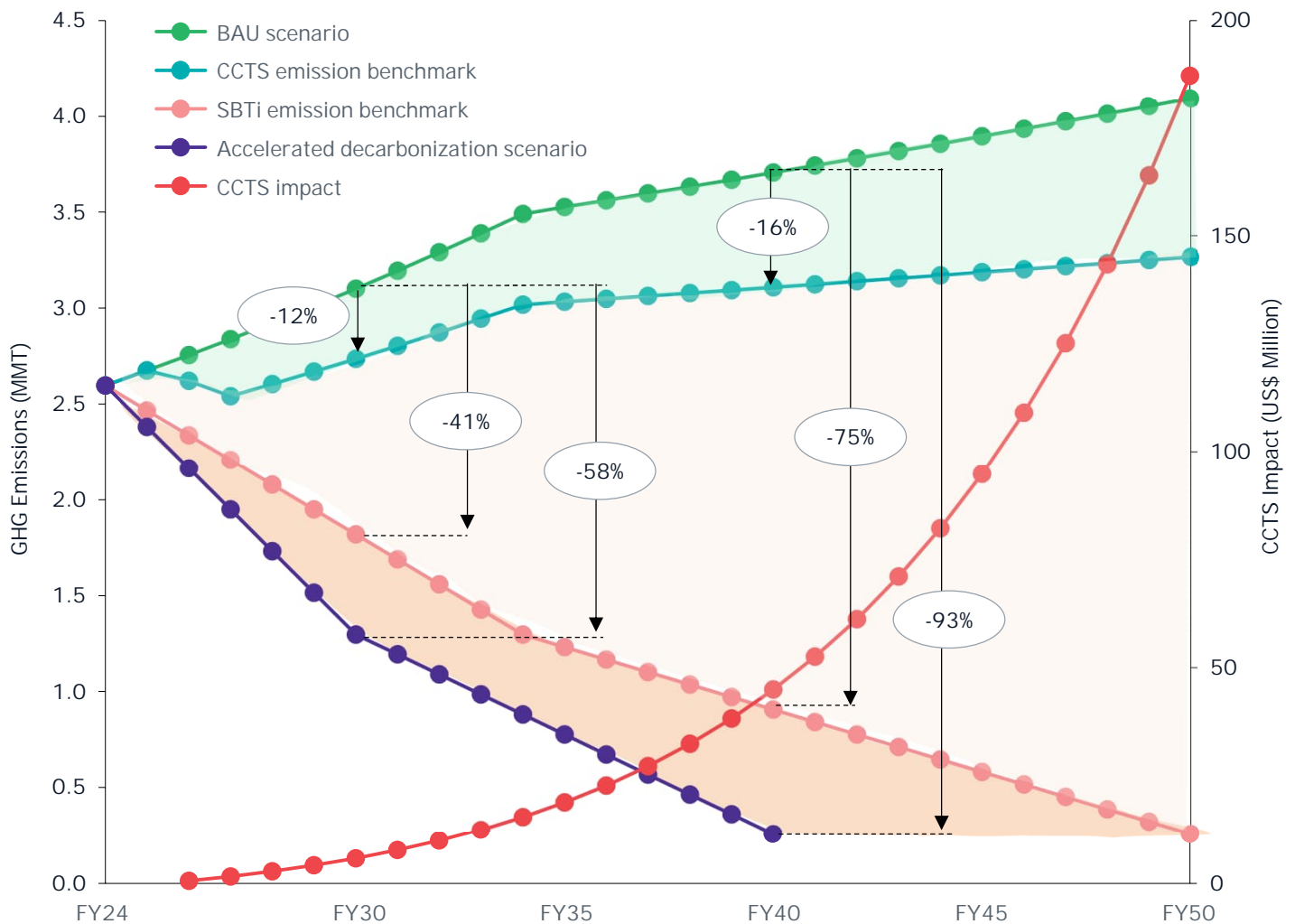
- Sectoral Reduction target
 - An average reduction of 5% from the baseline will be required during the compliance period
 - This would translate to ~1100 KT reduction of CO₂ e by FY27 (assuming constant installed capacity as per FY 2023-2024)



Source: EYP Research, [PIB](#)

Case Study: A petrochemicals production company should start decarbonizing their assets to avoid CCTS penalties on 12-16% emissions differential from BaU

Emission scenarios with CCTS/ SBTi mandates and cost saving potential



Source: EY-Parthenon Analysis

Note:

1. SBTi targets are aligned as per 1.5 Degree scenario with long term target of 50% emission reduction in 10 years and net zero by 2050
2. Accelerated decarbonization scenario targets 50% emission reduction by 2030 and net zero by 2040
3. The petrochemical sector is projected to grow at 3% annually until FY 2035, after which the growth rate is expected to stabilize at 1% in the long term

The company would have to pay for these emissions under the CCTS scheme in case of BAU scenario (e.g., if company does not decarbonize).

The company would have an emission differential of 41% by 2030 and 75% by 2040 if compared with SBTi targets.

The company would have an emission differential of 58% by 2030 and 93% by 2040 if compared with accelerated decarbonization targets.

- The company would have to pay for the excess emissions above the CCTS benchmark.
- The CCTS penalty will differ as the growth rate increases and the CCTS benchmark decreases if the company does not decarbonize.

- Since the SBTi line is below CCTS emission benchmark, adherence to the same and having an accelerated decarbonization journey can help the company avoid CCTS penalties.

Normative carbon pricing: The company is expected to incur a financial implication of ~INR107-113 crore from 2026 to 2030 due to the impact of CCTS if no decarbonization is undertaken

Sensitivity Analysis highlighting financial impact FY 26-30 (cr.)

Sensitivity Table	Production growth scenario	No Growth	Pessimistic	Normative (Petrochem. growth)	Optimistic
CCTS industry benchmark scenario	%	0	1%	3%	5%
As-is (Present)	As per BEE Gazette	92-98	97-103	107-113	117-123
Industry Weighted Average	Average of all plants (category wise) (in terms of GEI)	77-83	81-87	88-94	96-102
Pessimistic (stricter targets)	-5% (GEI target lower Industry weighted avg)	131-137	138-144	149-155	162-168
Optimistic (lenient targets)	+5% (GEI target higher than Industry weighted avg)	23-29	25-31	27-33	20-36



Insights

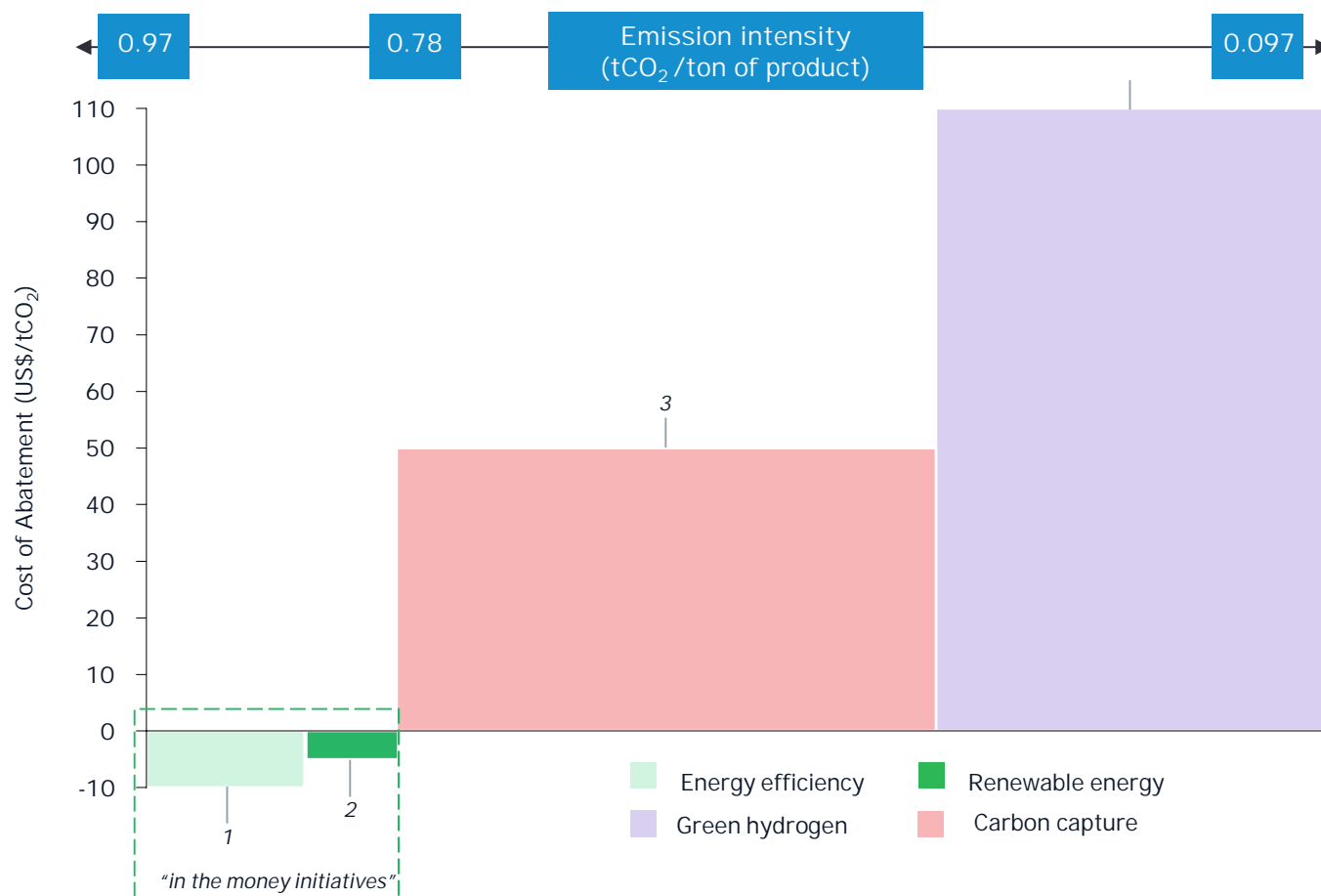
- In the BAU scenario, taking into account a 3% industry growth rate for petrochemical industry, the company is projected to experience a financial impact of INR107-113 crore from 2026 to 2030, considering the carbon price at US\$10 per ton of CO₂eq.
- The costs in the table represent the cost of not decarbonizing for the company.

Assumptions:

- One plant of the company has been considered for analysis in this table (taken directly from the GoI Gazette by BEE).
- The financial impact is calculated cumulatively from 2026 to 2030. The net present value of the impact has been mentioned in the table.
- A carbon price scenario with a normative pricing of US\$10 has been taken into account for the analysis
- Production growth scenarios have been built basis the petrochemical sector trends in India.
- The "Industry Weighted Average" for GHG emission intensity has been considered for scenario analysis
- The CCTS benchmark sensitivity scenarios have been built basis +5% and -5% of the "Industry Weighted Average" intensity benchmark.

Source: EY-Parthenon Analysis

Carbon capture and green hydrogen are the most critical levers for decarbonizing the petrochemical sector, together accounting for ~70% of potential emission reductions

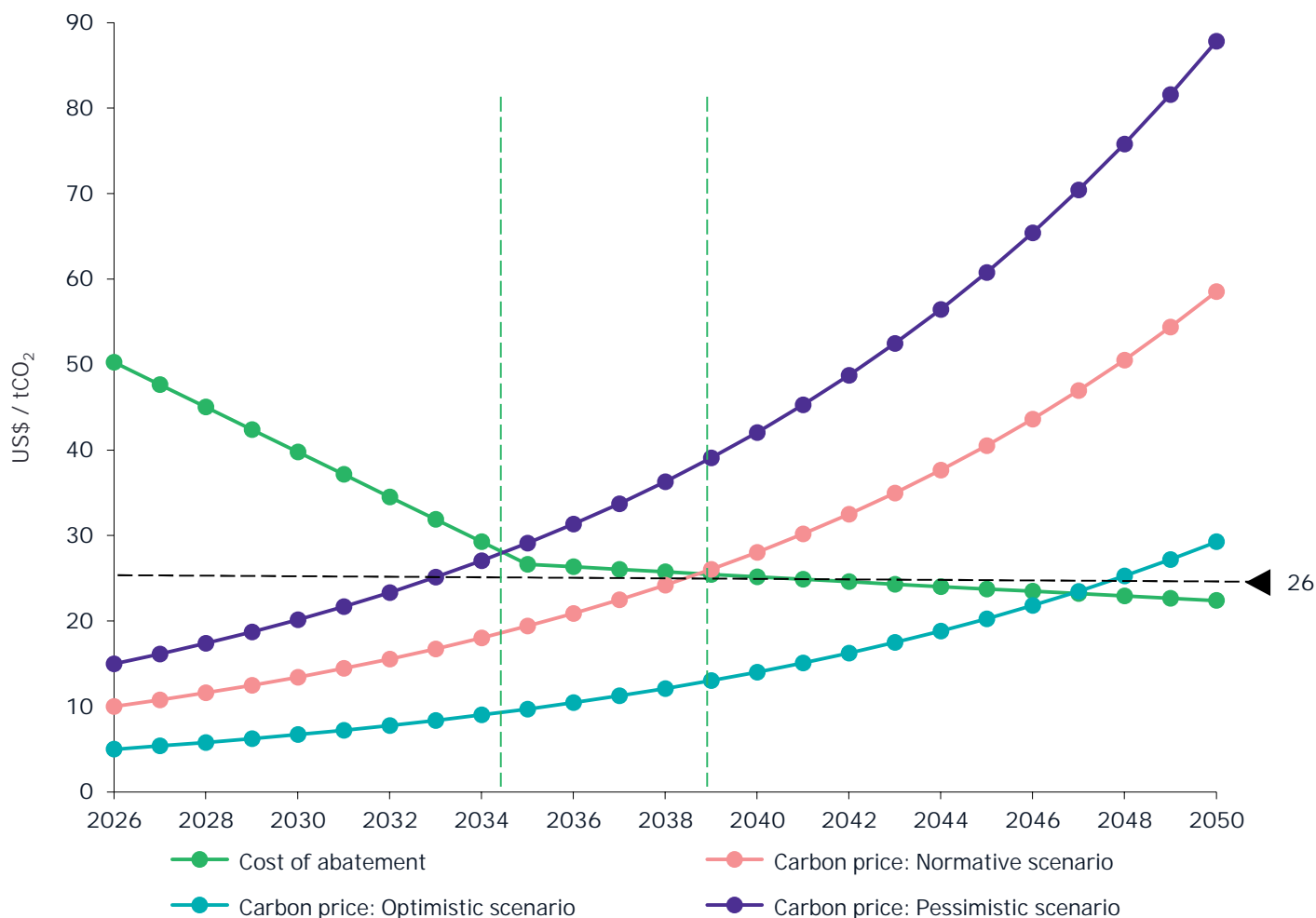


1. Energy efficiency	3. Carbon capture
2. Renewable energy adoption	4. Partial substitution of green H2 as fuel

Source: EY-Parthenon Analysis

The petrochemical sector may start investing in decarbonization technologies now, as the cost of abatement is projected to drop below the Indian carbon prices in next 8 to 9 years

Indian petrochemicals sector: Cost of Abatement v/s Carbon Prices



Insights

- By abating CO₂ emissions at a cost lower than the carbon price, the petrochemical industry may realize significant cost savings by overcoming the higher costs tied to carbon prices.
- In a normative scenario, it is projected that by the year 2039, the cost of decarbonization will drop below US\$26/tCO₂. Concurrently, carbon prices in India are expected to rise above this level.
- As the technologies scale further and matures in upcoming years, the cost of decarbonization decreases further, leading to quicker incentivization for the industry.

Assumptions:

- A carbon price scenario with a normative pricing of US\$10/tCO₂ in 2026 has been taken into account for the analysis.
- In pessimistic and optimistic scenarios, the carbon price starts at US\$15 and US\$5, respectively.
- All identified decarbonization levers are considered at once to plot the blended cost of abatement in each year.

Source: EY-Parthenon Analysis



“

India's CCTS is not just a market reform, it is a national reset. By putting a real price on carbon, it compels industries to rethink how they grow, compete, and innovate. This is the moment that will define India's trajectory toward genuine low-carbon leadership.

Kapil Bansal

“

India's Carbon Credit Trading Scheme converts climate commitment into economic strength. By turning every tonne of carbon reduced into a tangible asset, it empowers industries to scale innovation, unlock new value, and compete in a rapidly decarbonizing world.

Reshma RN

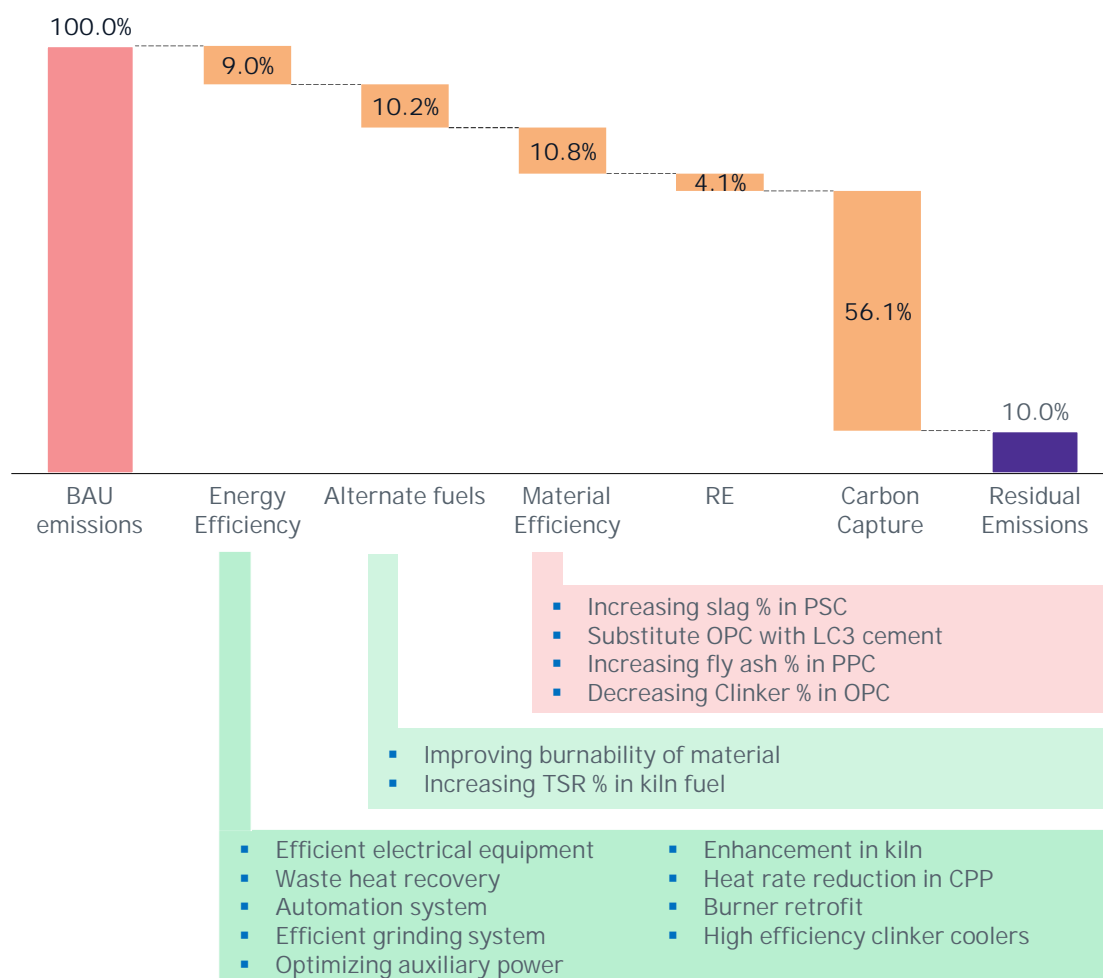


4 | Recommendations



The cement industry needs to prioritize energy efficiency and material efficiency to meet the CCTS targets; focus on carbon capture in the long run to achieve net zero targets

Cement sector Decarbonization levers



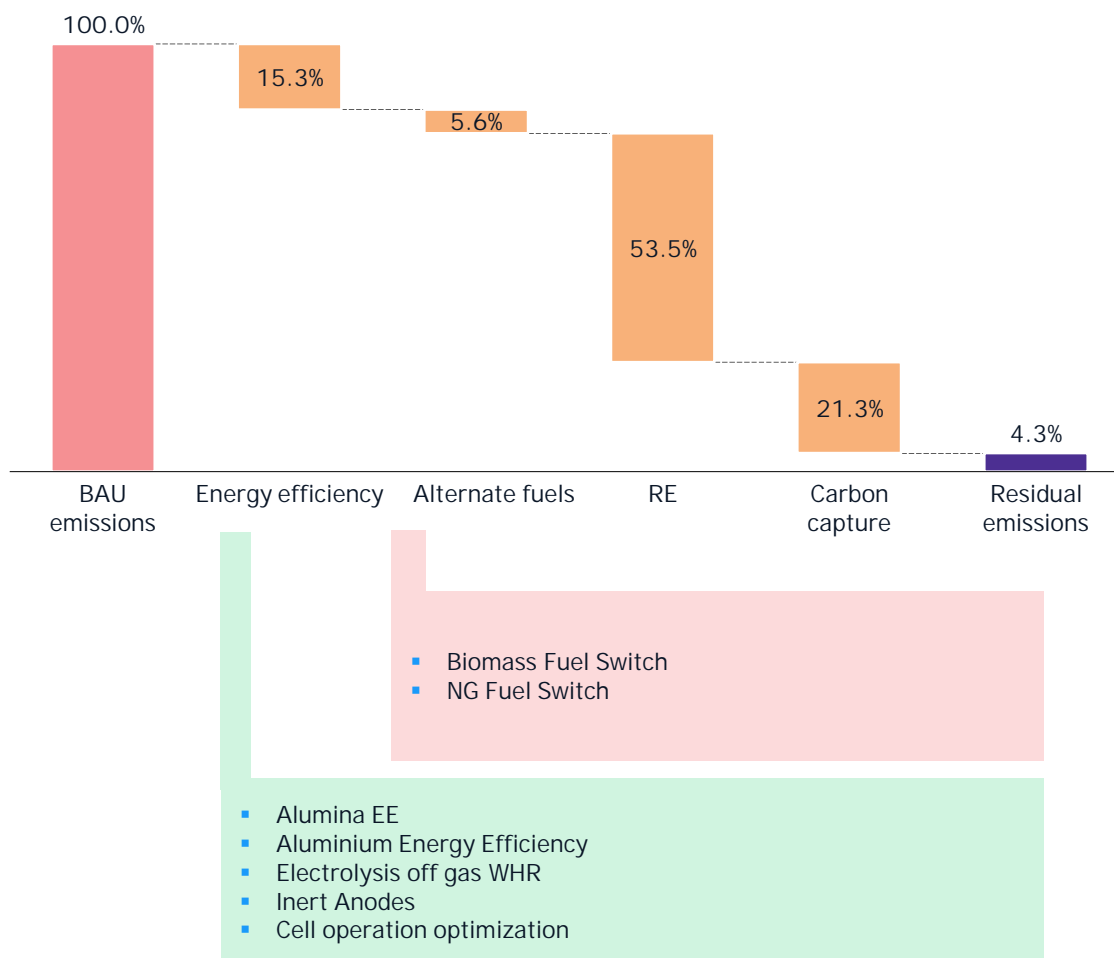
EY-P recommendations

- Committing to SBTi will help companies mitigate CCTS penalties, as the initial compliance period for CCTS is till FY27. While future targets are unknown, companies committing to SBTi (which requires a 90% emission reduction by 2050) can safely avoid CCTS penalties.
- Indian companies must conduct a thorough impact assessment of the CCTS on their operations, identify specific compliance requirements, and establish internal monitoring and reporting mechanisms.
- Cement companies need to focus on “in the money” initiatives in the short-run to meet the CCTS target intensity, specifically energy efficiency and material efficiency measures.
- Carbon capture is the biggest lever contributing to cement industry decarbonization. The government needs to encourage the early adoption of carbon capture technologies through grants, tax credits, funding for R&D and setting up of Centers of Excellence (CoE).
- Cement companies committing to sustainability targets through SBTi, RE100, etc., and getting ranked highly by CDP can enhance their brand recognition globally and help with green financing.
- Cement companies can leverage green financing to realize their decarbonization initiatives, e.g., Ultratech Cement has committed to SBTi and has set up GHG reduction targets. The company has raised US\$500 million through sustainability-linked loan (SLB).

Source: EY-Parthenon Analysis

Aluminum industry needs to prioritize Energy efficiency, Alternate fuels adoption to meet the CCTS targets; focus on RE adoption in the long-run to meet Net Zero targets

Aluminium sector Decarbonization levers



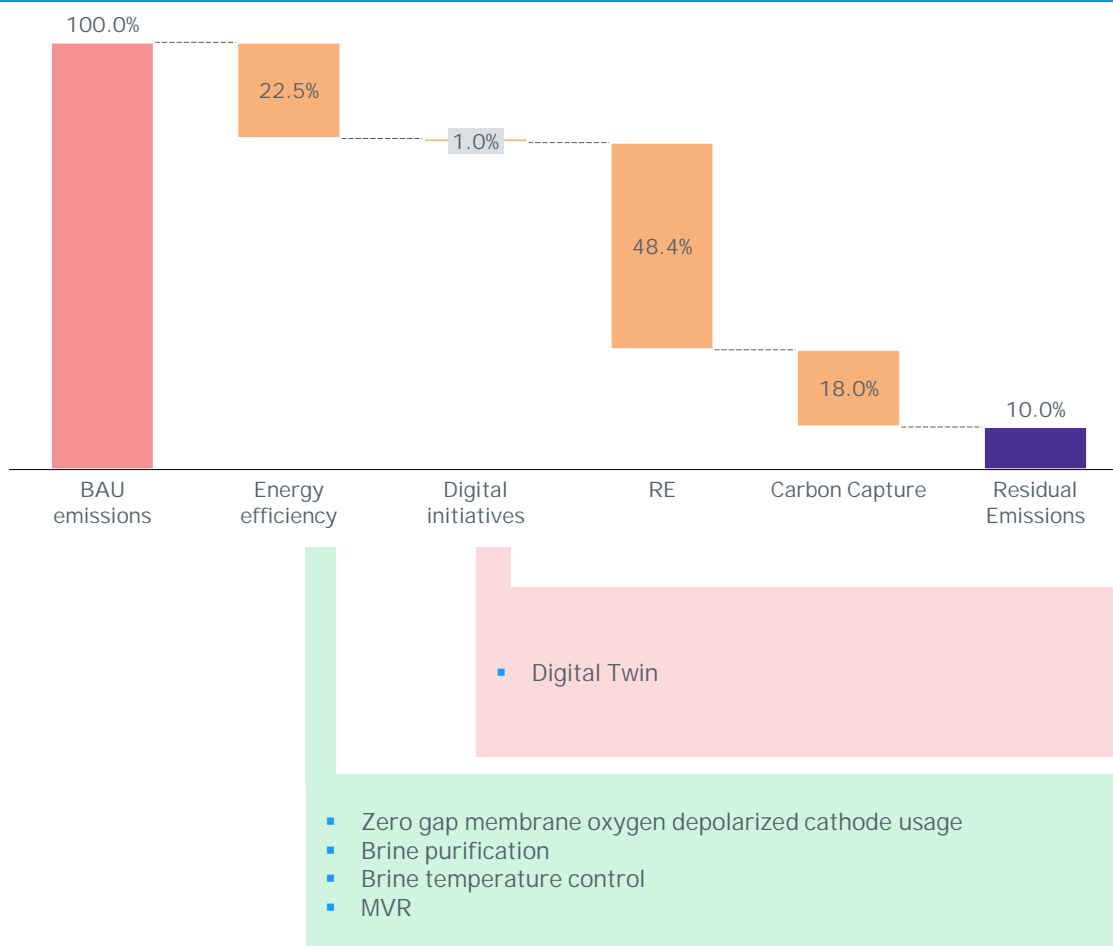
EY-P Recommendations

- Committing to SBTi will help companies mitigate CCTS penalties, as the CCTS initial compliance period is till FY27, future targets are unknown, companies committing to SBTi (which requires a 90% emission reduction by 2050) can safely avoid CCTS penalties
- Indian companies must conduct a thorough impact assessment of the CCTS on their operations, identify specific compliance requirements, and establish internal monitoring and reporting mechanisms
- Aluminium companies need to focus on "In the money" initiatives in the short-run to meet the CCTS target intensity – Energy efficiency and Alternate fuel adoption
- Most Indian Aluminium companies have captive coal-based power plant, which might not make transition to RE power a cost saving measure, replacing end of life CPP assets with RE can be the way forward for aluminium industry
- Govt. needs to encourage earlier adoption of carbon capture technologies through grants, tax credits and funding R&D and setting up Centre of Excellences (CoE)
- Hindalco is recognized as the World's Most Sustainable Aluminium Company as per S&P Dow Jones Sustainability Indices (DJSI) owing to its sustainable practices and commitments

Source: EY-Parthenon Analysis

Chlor Alkali industry needs to prioritize Energy efficiency, Digital twin initiatives to meet the CCTS targets; focus on RE adoption and Carbon capture in the long-run to meet Net Zero targets

Chlor Alkali sector Decarbonization levers



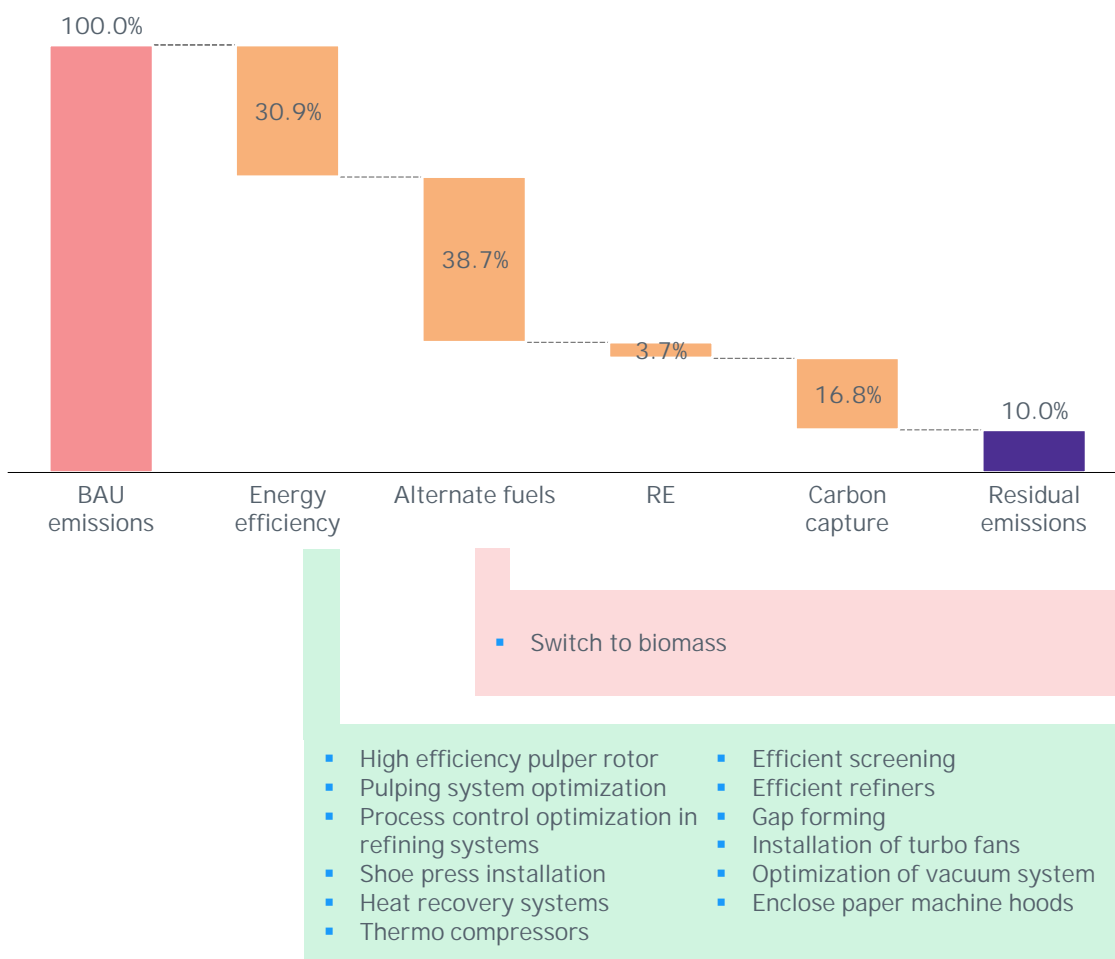
EY-P Recommendations

- Committing to SBTi will help companies mitigate CCTS penalties, as the initial compliance period for CCTS is until FY27. Future targets are unknown, but companies committing to SBTi (which requires a 90% emission reduction by 2050) can safely avoid CCTS penalties.
- Indian companies must conduct a thorough impact assessment of the CCTS on their operations, identify specific compliance requirements, and establish internal monitoring and reporting mechanisms.
- Chlor-alkali companies need to focus on “in the money” initiatives in the short run to meet the CCTS target intensity, specifically energy efficiency and digital twin initiatives.
- RE adoption and carbon capture are going to be the biggest levers contributing to the decarbonization of the chlor-alkali sector.
- Most Indian chlor-alkali companies have captive coal-based power plants in conjunction with associated chemical companies, which might not change to RE a cost-saving measure. Replacing end-of-life CPP assets with RE can be the way forward.
- The government needs to encourage the early adoption of carbon capture technologies through grants, tax credits, funding for R&D and setting up of Centers of Excellence (CoE).

Source: EY-Parthenon Analysis

Paper & Pulp industry needs to prioritize Energy efficiency, Low carbon fuel switch (Biomass) to meet the CCTS targets; focus on Carbon capture in the long-run to meet Net Zero targets

Paper & Pulp sector Decarbonization levers

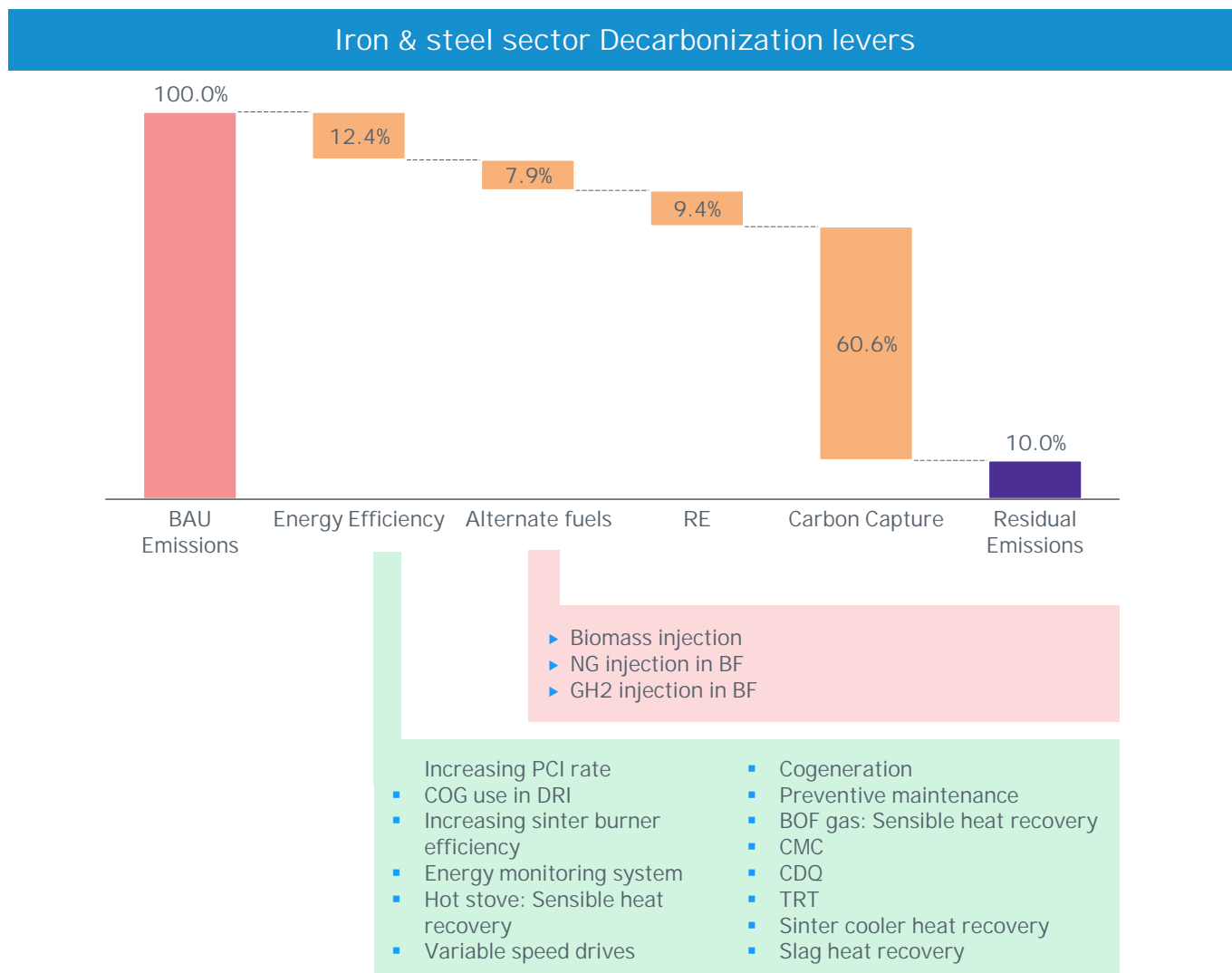


EY-P Recommendations

- Committing to SBTi will help companies mitigate CCTS penalties, as the initial compliance period for CCTS is till FY27. Future targets are unknown, but companies committing to SBTi (which requires a 90% emission reduction by 2050) can safely avoid CCTS penalties.
- Indian companies must conduct a thorough impact assessment of the CCTS on their operations, identify specific compliance requirements, and establish internal monitoring and reporting mechanisms.
- Paper companies need to focus on “in the money” initiatives in the short run to meet the CCTS target intensity, specifically energy efficiency and switch to low carbon fuels like biomass.
- Companies should understand the mechanisms for generating and trading carbon credits under CCTS, as this can be a revenue source for companies with low carbon intensity.
- The government needs to encourage the early adoption of carbon capture technologies through grants, tax credits, funding for R&D and setting up of Centers of Excellence (CoE).
- Companies committing to sustainability targets through SBTi, RE100, etc., and getting ranked highly by CDP can enhance their brand recognition globally and help with green financing.

Source: EY-Parthenon Analysis

Iron and steel industry needs to prioritize Energy efficiency, Low carbon fuel switch (Biomass) to meet the CCTS targets; focus on Carbon capture in the long-run to meet Net Zero targets



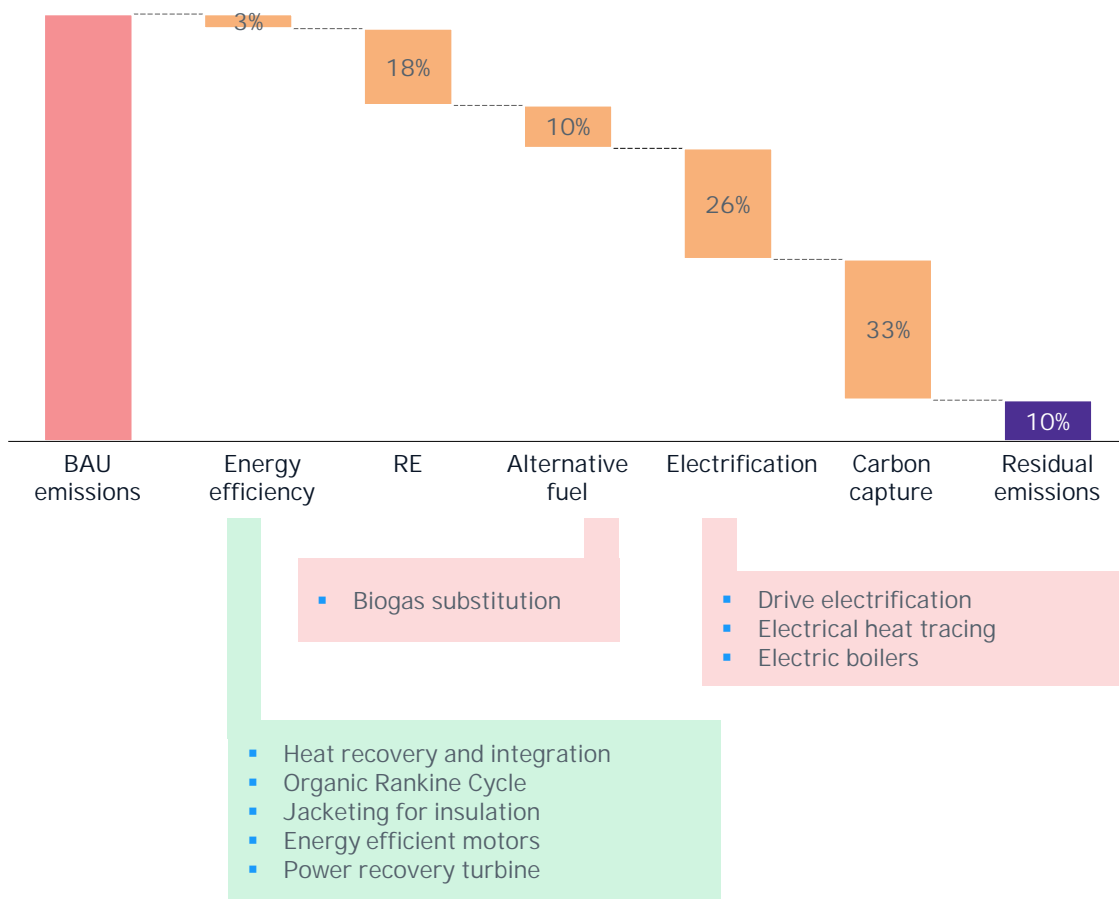
EY-P Recommendations

- Committing to SBTi will help companies mitigate CCTS penalties, as the initial compliance period for CCTS is till FY27. Future targets are unknown, but companies committing to SBTi (which requires a 90% emission reduction by 2050) can safely avoid future CCTS penalties.
- Indian steel companies must conduct a thorough impact assessment of the CCTS on their operations, identify specific compliance requirements, and establish internal monitoring and reporting mechanisms.
- Iron and steel companies should first focus on “in the money” initiatives like energy efficiency in the short run to meet the CCTS target intensity .
- Companies should understand the mechanisms for generating and trading carbon credits under CCTS, as this can be a revenue source for companies with low carbon intensity.
- The government needs to encourage the early adoption of carbon capture technologies through grants, tax credits, funding for R&D and setting up of Centers of Excellence (CoE), as this can reduce 60% of the sector's emissions.
- Companies committing to sustainability targets through SBTi, RE100, etc., and getting ranked highly by CDP can enhance their brand recognition globally and avail green financing.

Source: EY-Parthenon Analysis

Indian refiners should prioritize energy efficiency, drive electrification, RE adoption to meet the CCTS targets; focus on electric boilers & carbon capture in the long-run to meet Net Zero targets

Refineries Decarbonization levers



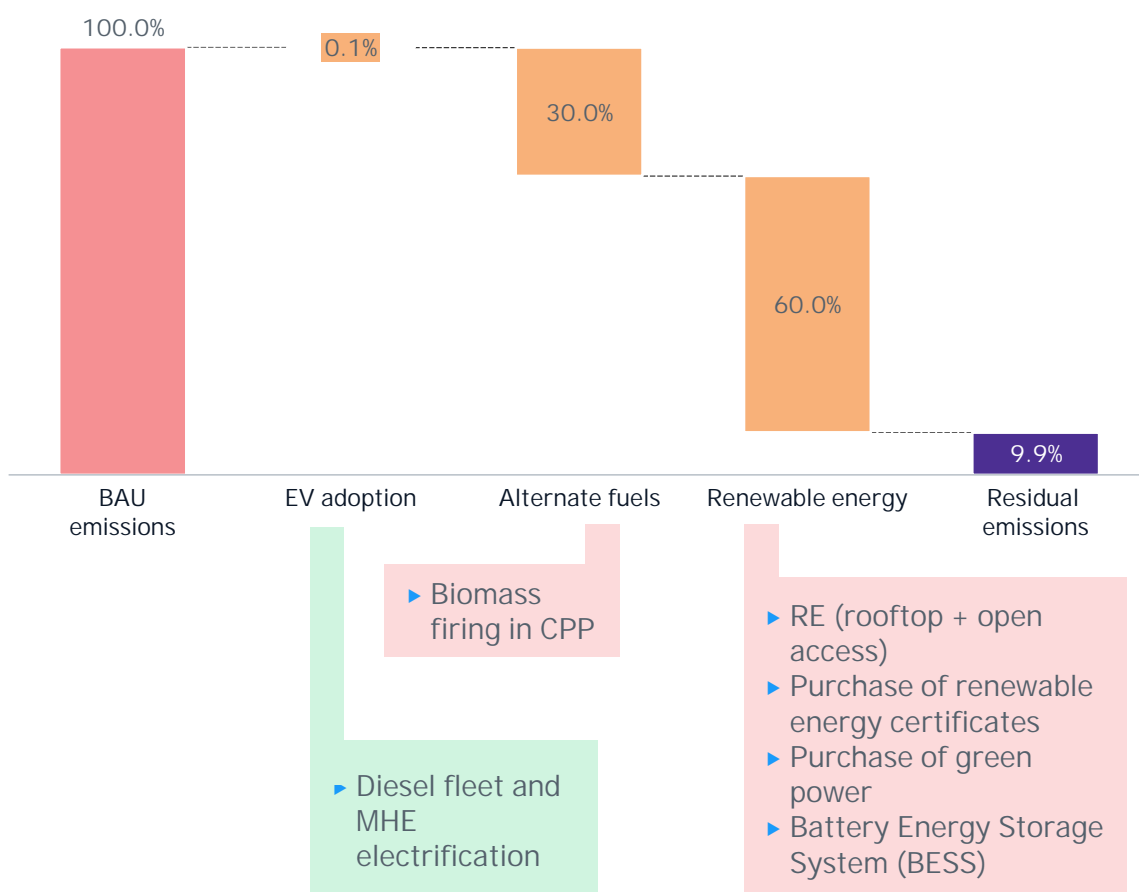
EY-P Recommendations

- Setting net zero targets will help refineries mitigate CCTS penalties, as the initial compliance period for CCTS is until FY27. Future targets are unknown, but companies committing to net zero (which requires a 90% emission reduction) can safely avoid future CCTS penalties.
- Indian refineries must conduct a thorough impact assessment of the CCTS on their operations, identify specific compliance requirements, and establish internal monitoring and reporting mechanisms.
- The companies should first focus on “in the money” initiatives like energy efficiency, RE adoption in the short run to meet the CCTS target intensity.
- Companies should understand the mechanisms for generating and trading carbon credits under CCTS, as this can be a revenue source for companies with low carbon intensity.
- The government needs to encourage the early adoption of carbon capture technologies through grants, tax credits, funding for R&D and setting up of Centers of Excellence (CoE), as this can reduce 33% of the sector's emissions.
- Companies committing to sustainability targets through net zero, RE100, etc., and getting ranked highly by CDP can enhance their brand recognition globally and avail green financing.

Source: EY-Parthenon Analysis

The textile sector should adopt biomass and open access RE in the short term, and gradually increase RE coverage through RECs, green power, and BESS in the long term

Textiles Sector Decarbonization levers

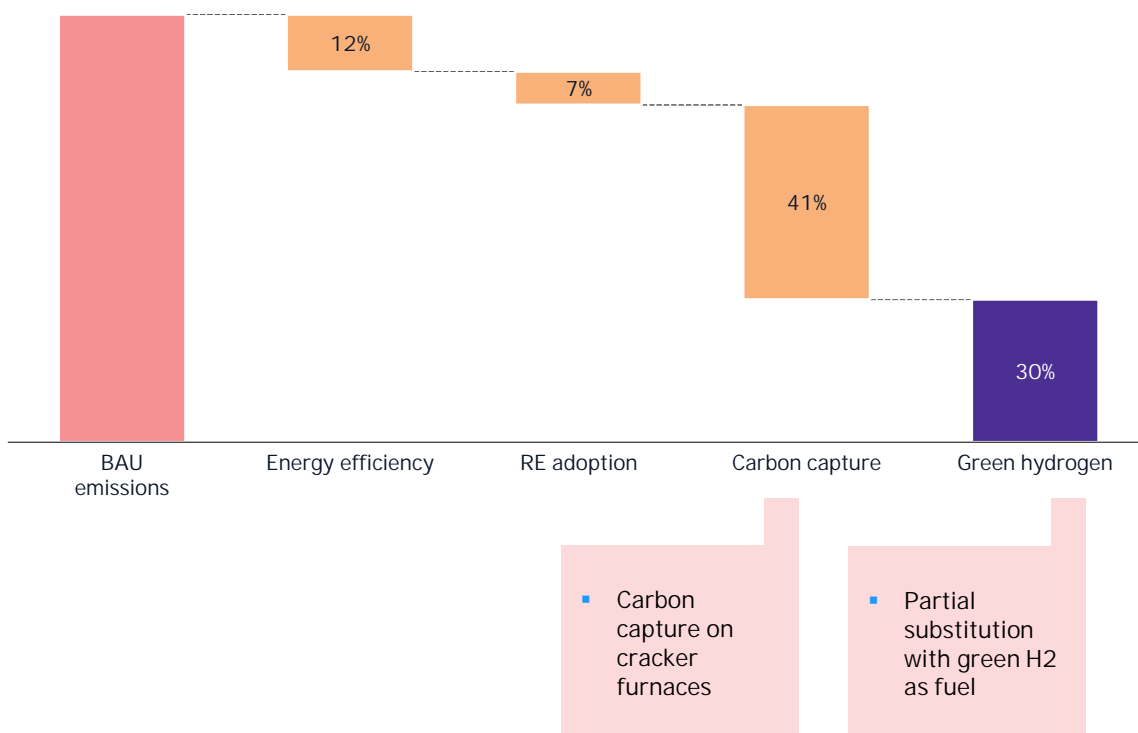


EY-P Recommendations

- Setting Net Zero targets will help refineries mitigate CCTS penalties, as the CCTS initial compliance period is till FY27, future targets are unknown, companies committing to Net Zero (which requires a 90% emission reduction) can safely avoid future CCTS penalties
- Indian refineries must conduct a thorough impact assessment of the CCTS on their operations, identify specific compliance requirements, and establish internal monitoring and reporting mechanisms
- The companies should first focus on "In the money" initiatives like Energy efficiency, RE adoption in the short-run to meet the CCTS target intensity
- Understand the mechanisms for generating and trading carbon credits under CCTS, this can be a revenue source for companies with low carbon intensity
- Govt. needs to encourage earlier adoption of carbon capture technologies through grants, tax credits and funding R&D and setting up Centre of Excellences (CoE) as it can reduce 33% of the emissions of the sector
- Companies committing to sustainability targets through Net Zero, RE100 etc. and getting ranked highly by CDP can enhance their brand recognition globally and avail green financing

Petrochemical industry needs to prioritize Energy efficiency, RE adoption to meet the CCTS targets; focus on Carbon capture and green H2 in the long-run to meet Net Zero targets

Petrochemicals Sector Decarbonization Levers



EY-P Recommendations

- Committing to SBTi will help companies mitigate CCTS penalties, as the CCTS initial compliance period is till FY27, future targets are unknown, companies committing to SBTi (which requires a 90% emission reduction by 2050) can safely avoid future CCTS penalties
- Indian petchem companies must conduct a thorough impact assessment of the CCTS on their operations, identify specific compliance requirements, and establish internal monitoring and reporting mechanisms
- Companies should first focus on “In the money” initiatives like energy efficiency and RE adoption in the short-run to meet the CCTS target intensity
- Understand the mechanisms for generating and trading carbon credits under CCTS, this can be a revenue source for companies with low carbon intensity
- Govt. needs to encourage earlier adoption of carbon capture and green H2 through grants, tax credits and funding R&D and setting up Centre of Excellences (CoE) as together they can reduce 71% of the emissions of the sector
- Companies committing to sustainability targets through SBTi, RE100 etc. and getting ranked highly by CDP can enhance their brand recognition globally and avail green financing

Source: EY-Parthenon Analysis



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