



Taskforce on Climate-Related Financial Disclosures (TCFD) Report FY 2024

Adani Ports and Special Economic Zone Limited

Managing Director's Message



Aligned with the Paris Agreement's 1.5°C target, we have set a bold ambition of achieving company-wide Net-Zero emissions by 2040, a decade ahead of global timeline of 2050.

Dear Stakeholders,

Today, the urgency of addressing climate change cannot be overstated. It not only impacts our company but also defines our shared future. At Adani Ports & SEZ (APSEZ), we firmly believe that collective action is essential for success, as any lapse jeopardizes our path towards a sustainable future. This challenge presents an opportunity for us to make a positive societal impact.

At APSEZ, our approach to this challenge is encapsulated in the mantra 'Mitigate, Adapt, and Transition.' This guides our efforts to reduce our climate footprint, enhance resilience, and position ourselves as trailblazers in the emerging low-carbon economy. This transition presents both risks and opportunities. As India's largest private ports and integrated logistics player, with a growing global footprint, APSEZ is committed to setting new standards for sustainability. The group's expertise in renewable energy and infrastructure offers APSEZ a unique advantage and strategically positions us to make our operations more sustainable.

Aligned with the Paris Agreement's 1.5°C target, we have set a bold ambition of achieving company-wide Net-Zero emissions by 2040, a decade ahead of global timeline of 2050. This commitment underscores our proactive stance in contributing to a sustainable future. In my capacity as the Managing Director of the company, it is my responsibility to keep you informed about key strategic initiatives being taken by the company to achieve our ambition.

Our Net-Zero plan involves substantial investments in the renewable energy installations and

electrification of equipment alongside energy efficiency measures. Our vision extends beyond business as usual. APSEZ aims to co-establish the world's largest green hydrogen ecosystem, revolutionizing port operations and shipping requirements. This approach not only aligns with our sustainability goals but also positions us as a crucial value chain partner for the broader decarbonization efforts across industries, not only in India but globally.

Given our operational interface between land and sea, we recognize the heightened physical risks posed by climate change, including extreme weather events (droughts, floods, cyclones, and others) and sea-level rise. Based on our comprehensive climate vulnerability assessments, we are considering ways to ensure that our business is robust and resilient in response to a range of climate scenarios. This is an important element of our relationship with all our stakeholders, particularly our customers, and the community.

APSEZ's sustainability performance has received international recognition, reflecting our commitment to leading the sector towards a low-carbon future. In closing, let me express my gratitude for your continued support. Together, we can drive meaningful change, turning climate challenges into opportunities for sustainable growth and collective prosperity for APSEZ and all its stakeholders.

Karan Adani
Managing Director

CEO's Message



We have successfully forested 4240 hectares of mangroves and conserved 2915 hectares, safeguarding local communities against extreme weather events.

Dear Stakeholders,

Climate change is undeniably one of the most pressing challenges facing our world today, starkly illustrated by the increasing frequency and severity of natural disasters. These events serve as a poignant reminder of the urgent need for decisive global action.

The ongoing UN Framework Convention on Climate Change (UNFCCC) negotiations are pivotal, uniting nations in a shared mission to determine the future of our planet.

As CEO, I am confident of APSEZ's capacity to adapt and thrive in this evolving landscape. The shift towards a low-carbon global economy presents both challenges and opportunities. We are to respond swiftly, recognizing that the consequences of the low-carbon transition are at least as profound as, if not greater than, the previous industrial revolutions.

Our company is uniquely positioned to capitalize on this transition. Drawing on the expertise of our group companies in renewable energy development, we are focused on co-developing large-scale renewable and green energy infrastructure at the lowest costs. Our objective is clear: to decarbonize our operations, support co-located and logistics industry, and drive transformative change in India's energy landscape by becoming an integral part of the green hydrogen supply chain.

In parallel, APSEZ is also committed to implementing high-quality nature-based solutions for climate mitigation. We have successfully forested 4240 hectares of mangroves and conserved 2915 hectares, safeguarding local communities against extreme weather events.

To mitigate and adapt, we've included climate change as a material risk in our Enterprise Risk Management framework. Through rigorous climate vulnerability assessments of our ports and terminals, we are enhancing our resilience strategy. This resilience is vital for our relationship with stakeholders—our employees, shareholders, customers, and the community.

As a key player in the global supply chain, our ambition is to become the largest private port operator globally by FY 2030. We are targeting handling of one billion tons of cargo at our ports in 2030, which is more than double the cargo volumes handled by us in FY 2024. The growth in cargo volumes would primarily be supported by expansion of most of our ports within India and the expansion of our international port's portfolio driven by the increasing share of India in the global trade. We expect our logistics business to grow by around 7x in the next five years. This growth will primarily be driven by the addition of a new 'Trucking' business segment, which will enhance our end-to-end service model. Alongside this, we expect to speed up the addition of assets across other logistics sub-segments such as trains, MMPLs, Agri silos, and warehousing.

As we grow, we are committed to balancing operational efficiency with resilience, ensuring that sustainability remains at the core of our strategy.

Ashwani Gupta

Chief Executive Officer

ESG Head's Message



Dear Stakeholders,

For APSEZ, FY 2024 has been a landmark year, marked by phenomenal business growth and significant progress in our sustainability endeavors, particularly in advancing climate action. Our two-pronged strategy which includes electrification of equipment and adoption of renewable energy sources has driven significant reductions in APSEZ's emission footprint.

Over the past two fiscals, APSEZ has invested Rs 1291 crore in the electrification of equipment. Today, the majority of cranes at our ports operate on electricity, and we have successfully replaced diesel-powered internal transfer vehicles with 338 efficient battery-powered counterparts. These initiatives, alongside other energy efficiency measures, have resulted in a 51% decrease in our energy intensity from the base year. The foremost decision in this regard is adding renewable capacity to meet our electricity requirement, including auxiliary power supply for the berthed ships, making us a preferred port for shipping lines committed to decarbonization.

To achieve our Net-Zero commitment by FY 2040, we will need to power over 90% of the port's energy demand through zero-carbon sources. The tough-to-decarbonize operations such as dredging, harboring, and heavy equipment such as dozers, excavators, etc. will take slightly longer to transition to greener options.

Given the criticality of climate stressors to APSEZ's business, building resilience in infrastructure and

processes is vital in providing seamless service to our customers. A climate-resilient infrastructure will provide APSEZ with a competitive advantage. We are therefore investing in: (i) assessing the climate vulnerability of our infrastructure; (ii) developing robust adaption plans; and (iii) implementing an internal carbon pricing mechanism for our operations to help us internalize the cost of carbon and choose the best mitigation measures.

Our efforts have already yielded significant results. Four global rating agencies—CDP, S&P, Sustainalytics, and Moody's— have assigned a strong ESG rating to us. We secured the Leadership band in the CDP Climate Assessment FY 2023, ranking first in the environmental dimension among 324 companies in the transport and transport infrastructure sector by S&P Global CSA 2023 (DJSI). We also secured the top rank in the marine ports sector for low-carbon transition rating by Sustainalytics and attained an 'Advanced' rating in Moody's Energy Transition Rating, ranking first in the overall ESG Assessment and Strategy review in their last update.

With an unwavering commitment to sustainable growth, APSEZ continues to focus on creating value for all its stakeholders, while striving to become the world's largest port operator globally.

Charanjit Singh

Head ESG & Investor Relations

Electrification of equipment such as cranes and ITVs, alongside other energy efficiency measures, have resulted in a 51% decrease in our energy intensity from the base year.

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Climate Change Governance

Governance Philosophy

Climate change is an integral part of sustainability strategy at APSEZ. The sustainability governance systems are outlined in the Sustainability Charter which facilitates goal setting and actions across the business, reporting of climate information, external and internal stakeholder engagement and setting overall accountability.

Our climate governance philosophy is driven by our intent to incentivise and build capability for climate action. We have fixed clear management responsibility for climate actions and built a robust framework for Board oversight, risk management, climate reporting, and control & audit of processes.

Climate governance philosophy, management responsibility, Board oversight, climate governance committees and their responsibilities



Board Oversight



- Corporate Responsibility Committee (CRC)
- Corporate Social Responsibility Committee (CSRC)
- Stakeholder Relationship Committee (SRC)
- Risk Management Committee (RMC)

Quarterly meetings

Management Oversight



- Sustainability Leadership Committee (SLC) - Corporate Level

Sustainability Steering Committee (SSC) - Site Level

Working Group



CORPORATE ESG TEAM
Develops the Company's ESG Agenda and supports business functions in driving the implementation.

Site ESG team
Responsible for the implementation and execution of the ESG agenda, tracking and monitoring performance.

Business functions

Responsible for the implementation and execution of ESG agenda, tracking and monitoring performance.

Management Responsibility & Board Oversight

The Board, supported by Corporate Responsibility Committee (CRC), Corporate Social Responsibility Committee (CSRC), Stakeholder Responsibility Committee (SRC) and Risk Management Committee (RMC), monitors performance, adherence to the standards and risks in the organisation. The Corporate Responsibility Committee (CRC) oversees the implementation of the ESG Strategy and policies, including the management of climate risks and delivery against the climate mitigation and adaptation targets. Management of climate priorities is embedded across business areas, corporate and business unit level, flowing from the Board. At the corporate level, CRC reviews performance against environmental and social metrics and develops a strategy while the ESG team develops the Company's ESG agenda and support business functions in driving implementation.

Governance Committees & Their Responsibilities

We have sustainability committees at different levels – Board, Corporate and Site. Our cross-functional Sustainability Leadership Committee (SLC), chaired by the CEO, is responsible for ensuring the operationalisation of sustainability as a part of our strategy. The Sustainability Leadership Committee (SLC) shape the business strategy by:

- Overseeing strategies, policies and practices on sustainability matters to attain

Company's Sustainability frameworks, risks, standards, priorities, community-led initiatives and partnerships.

- Reviewing and reporting to the Board on Company's performance, international sustainability trends, benchmarking against peers and public disclosures.

At the site-level, the Site Heads support the implementation of our sustainability strategy

in their respective functions through a Sustainability Steering Committee (SSC).

The Corporate Responsibility Committee, Corporate Social Responsibility Committee and Stakeholders' Relationship Committee oversee the policy commitment and ensure the alignment of material ESG aspects, including human rights, with the business strategy.



Climate Context for Port & Logistics

Socio-economic significance; vulnerability to climate change, low carbon transition & changing business landscape, UN Sustainable Development Goals, physical & transition risks, climate commitments



Building Climate Resilience is Key

Ports are critical to economy & people

- Convergence of different modes of transport
- Connects hinterland and foreland
- Gateway to goods and commodity trade
- Critical node in the supply-chain
- Global trade connectivity attracts foreign capital & new technology in the hinterland
- Invigorates economic activities improving standard of living

...and have high climate exposure & impact on biodiversity

- Convergence of land and sea ecosystem; presence of rich coastal biodiversity
- Synergy with nature enables peaceful coexistence
- Located at the forefront of climate change impacts resulting from
 - Cyclone / Heavy Rain/ Storm Surge/ coastal flooding
 - Sea level rise
 - Impacts of higher salinity
 - Extreme temperature
- Coastal erosion
- Scarcity of freshwater resources, seawater intrusion
- Wave climatology
- Port operations have direct impact & dependency on coastal biodiversity
 - Mangrove vegetation
 - Marine ecosystem
 - Land based flora and fauna
 - Saltwater intrusion into aquifers

As a sea-land interface and a point of convergence between various modes of transport, ports act as a gateway to trade, providing access to global markets. The maritime transport handles over 80% of world's trade connecting the supply chain that spreads multiple geographies. Ports being the key nodes of maritime transport, their resilience is critical, and any major climate disruption could reverberate through the entire supply chain impacting availability of the goods and their prices.

By the fundamental nature of the sector, ports and associated infrastructure have higher exposure to climate hazards and face the risk of incurring significant impacts from climate change. Since the continuity of this trade sector in the 'business as usual scenario' is threatened by climate change, building resilience will be important to global trade and commerce in future.

Evaluating Exposure and Sensitivity to Climate-Externalities

Exposure & sensitivity due to unique location and heavy use of infrastructure

- Disproportionately high impacts from higher intensity and frequency extreme weather events
- Exposure to slow onset events like sea level rise, wave climatology, sea-surface salinity and temperature increase
- More vulnerable to extreme weather events than the slow onset events
- Threshold for impact is low given the port & logistics services are more sensitive than the physical assets to the climate stressors
- Physical assets are more sensitive to tail events than usual swing in intensity of weather events
- Exposure to specific under-sea events like swell wave which normally do not have much impact on land

The global climate policy to regulate greenhouse gas emissions is increasingly likely to influence how the demand for maritime transport evolves. We foresee commodity trade patterns evolving due to climate and policy considerations. Under all climate policy and commerce scenarios, we anticipate a significant increase in trade, with a change in distribution across commodities.

It is most likely and already evidenced that the world will transition more and more towards greener fuels to combat climate change. Also, the demand for greener and climate-resilient services will rise. We see these uncertainties and changes – direct and indirect-arising from climate change as an important element for us in the port and logistics sector.

Changes in the energy sector are an essential variant in the development of ports as energy commodities make up about 40% of seaborne trade (UNCTAD, 2016). Hence, the port development in terms of area, type of ships to berth, kind of cargo handled, and volume is bound to adjust as climate action continues to gain pace globally. Ports must be flexible and prepared for this change if competitiveness is to be maintained.



Factors Driving our Climate Response

Key drivers

- Global climate policy resulting in:
 - Implicit and explicit cost on the carbon emissions from operations
 - Low carbon shift pushing for new tech/ material (lithium, copper) trade
 - Low conventional energy commodities trade
 - Green fuel bunkering & supply chain demands
 - EXIM to cater to boarder carbon pricing adjustments
- Customer preference for responsible products & services
- Investor/ stakeholder push for responsible business
- Opportunity as energy hub for low carbon energy supply chain
- Adaptation to residual impacts of climate change

Port's own emission reduction requirement

In FY 2023, the Indian government released Green Ports Guidelines for the Major Ports in the public sector. According to the guidelines, the government owned ports are expected to reduce their CO2 emission intensity of cargo handled by at least 30% in FY 2030 and 70% in FY 2047 from FY 2023 base line. The share of renewable energy consumption at ports is required to reach at least 60% and 90% in FY 2030 and FY 2047 respectively, while the level of electrification of port equipment and vehicles is required to reach at least 50% and 90% in FY 2030 and FY 2047 respectively. APSEZ being the largest private port player in India has proactively taken similar or even more stringent steps to reduce its emissions which we have discussed in detail in the next chapter.

Decarbonisation of shipping sector to influence port business

The UN International Maritime Organisation (IMO) has set ambitions to cut annual GHG emissions from international shipping by at least half by FY 2050, compared with their level in FY 2008, and is further working towards phasing out the entire GHG emissions from shipping sector as soon as possible. The shipping sector's transition to low carbon is both a risk and an opportunity for the port business. The risk for the ports arises from the uncertainty related to policy support and availability of viable technology to meet the changing requirement of the shipping sector. Inability to act fast enough to meet the low carbon fuel or low-carbon services requirements of the ships calling the port could put ports at disadvantage. The opportunity arises in offshore

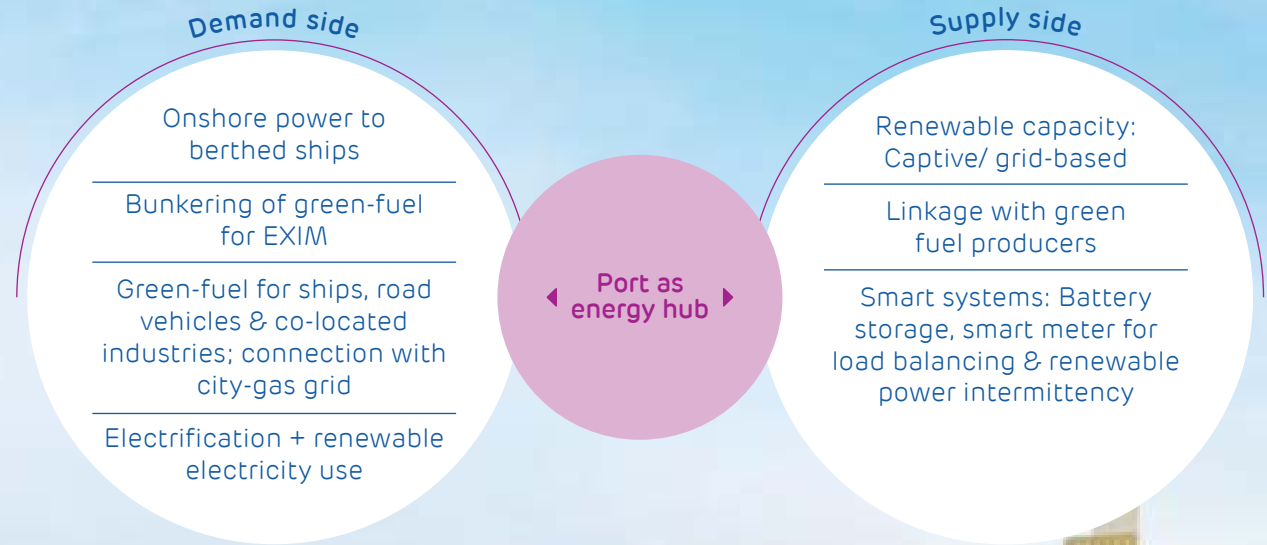
power supply, green bunker fuel, carbon capture & storage and other low-carbon maintenance services.

Ports are key to green fuel supply chain

Ports are a key node in the fossil fuel supply chain as an entry and exit point for the commodity and it will continue to remain pivotal in future for supply of low-carbon fuel, like green hydrogen. Port sites with ample supply of wind or solar energy, could also produce green hydrogen closer to the site, safely store and ship abroad or feed into the gas pipeline grid connecting the hinterland. It will also meet the low-carbon energy needs of the shipping and land transport sectors and emerge as an energy hub for other industries relying on green fuel.

...and, energy transition of transport sector and co-located industries

Port could emerge as the 'energy hub' in the new low carbon world. In future, ports will have to provide low carbon refueling facility and onshore renewable electricity supply to the berthed ships. The ports will be the hub for clean energy supply, like green hydrogen and other low-carbon energy; a mini-smart grid of green electricity that would provide plug and play options to ships and incoming vehicles on a mega scale; and a location for waste recycling & reuse and circular economy. In fact, ports could be the real catalyst for decarbonization of shipping, transport and other sectors that depend on the green fuel supply-chain.



Ports help fulfill UN Sustainable Development Goals

The economic ramification of the climate impacts on ports could be significant given its importance in the global supply chain of merchandise trade, energy and food supply. The scale and value of infrastructure that are used for port services are significant, which together

with their transportation links with the hinterland make them vital for the economy and impacts economic and social development of the region. As a result, building resilience of the port infrastructure would thus help in fulfilling the collective agenda set under the United Nations Sustainable Development Goals (UN SDGs) for “peace and prosperity for people and the planet”.

Most of our port infrastructure are in the remote and economically backward regions, hence, the economic activities stimulated by our operations enable improvement in the living standard of the communities in the vicinity. We expect to translate the broader business activities we simulate with our operations into India's port-driven economic development.

UN SDG Goals & Targets fulfilled by port & logistics business



Climate events that affect our ports

- 1 Sea level rise
- 2 Storm surge
- 3 Saltwater intrusion
- 4 Strong winds
- 5 Heavy rains
- 6 Electrical storms
- 7 River flooding
- 8 Extreme temperatures
- 9 Sedimentation
- 10 Drought
- 11 Reduced river flows
- 12 Coastal erosion

Such events can damage, deteriorate or destroy port infrastructure including, but not limited to, buildings.

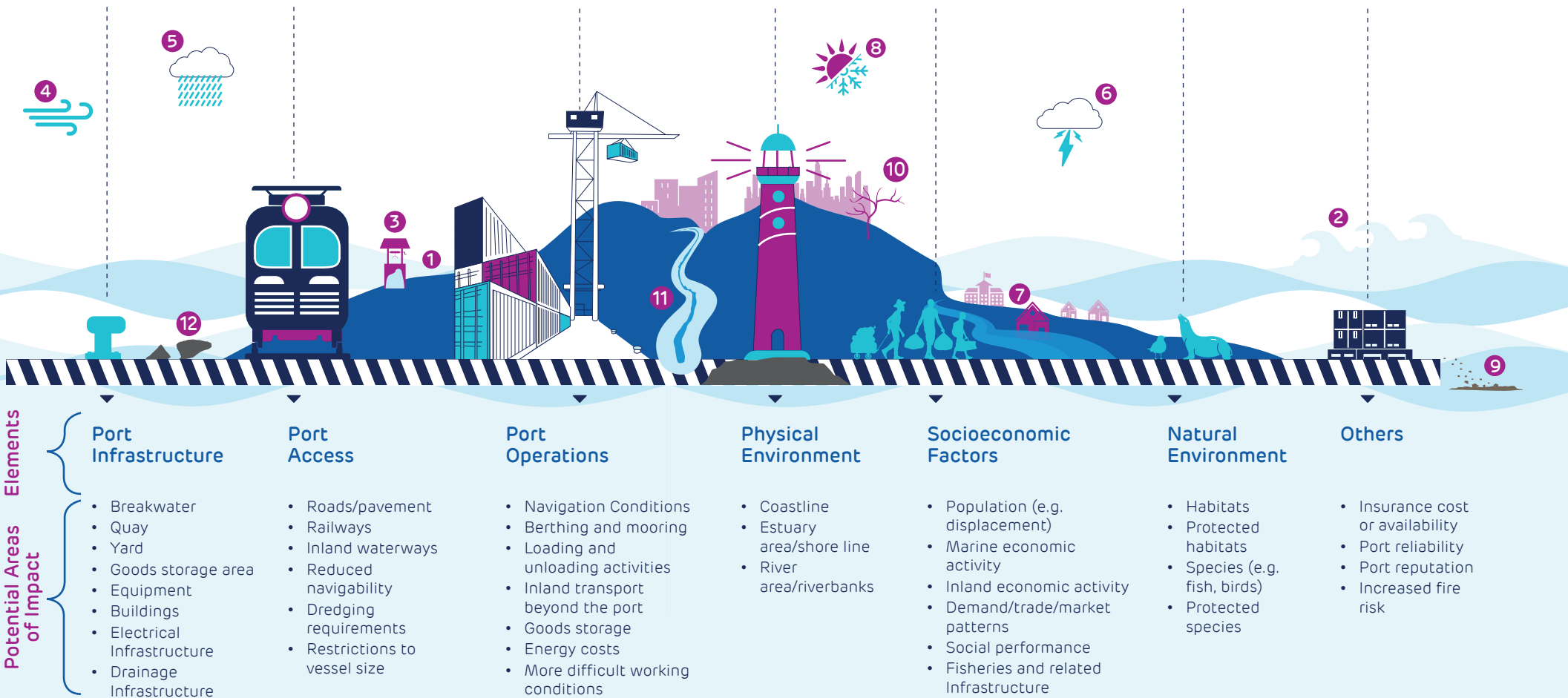
These types of events can also hamper port access or cause accidents or disruptions that could limit port operations or result in higher costs.

The physical environment in the area around the port can also be altered by climate-related events.

Socioeconomic impacts may include displacement of local populations or disruptions of livelihoods.

The natural habitat can also be affected, for example by changes in the distribution, growth and reproduction of species.

Any and all of these impacts can result in higher costs and further affect other aspects of ports.



APSEZ's Commitments on Climate Change

Our Commitments

- 1.5°C target as per the Paris Agreement
- Net-zero plan validated by SBTi
- Climate resilience
- Water Stewardship as per United Nations CEO Water Mandate
- Environmental protection

Our Goals

- Net-zero by 2040; validation of near-and long-term target by SBTi
- Carbon neutrality of port business by 2025
- Lower dependence on shared-water resources-below 20% by 2025
- Net-positive impact on Biodiversity by 2050
- No net deforestation by 2050

Climate commitments

Despite the collective effort required to combat climate change, we are committed to proactively surpassing regulatory requirements and industry standards in our climate actions. As we strive to become the world's largest port company by FY 2030, we have set industry-leading targets for mitigating greenhouse gas emissions and reducing natural resource consumption intensity.



Climate Risk Mitigation Strategy

Climate commitment, climate action plan, climate risks & opportunities, scenarios analysis of physical and transition risks, climate vulnerability & adaptation plan, mitigation of scope 3 emissions, climate investment



Climate Objectives and Strategy

With our commitment to align our business strategy with the inclusion of climate-related issues, APSEZ recognizes the critical importance of addressing climate-related risks and opportunities. The Company has set three overarching objectives which are the basis of all the climate policies and initiatives carried at the organization:

- Reducing the impact of our business emissions to meet the global carbon budget requirement in alignment with the 1.5°C world. Therefore, our GHG impact reduction pathway is set on a 1.5°C scenario
- We are building the physical resilience of our infrastructure based on an RCP 4.5 scenario i.e. preparing ourselves against physical risks posed by a greater than 2°C global warming
- For building business resilience to transition risks arising from the global commitment to low-carbon economy, we have again considered two scenarios: 1. IEA Stated Policy Scenario (IEA STEPS) which shows trajectory implied by today’s policy settings corresponding to greater than 2°C rise in temperature, and 2. Customized publicly available transition scenario like IPR 1.5°C ‘Required Policy Scenario’ which builds on IEA Net Zero Emissions (IEA NZE) scenario and is aligned with the 1.5°C target.

APSEZ’s overarching climate objectives



Our climate strategy focuses on three key pillars

Reducing our impact, building resilience and strengthening the system of our operations to the impacts of climate change and developing strong frameworks to integrate climate change considerations.

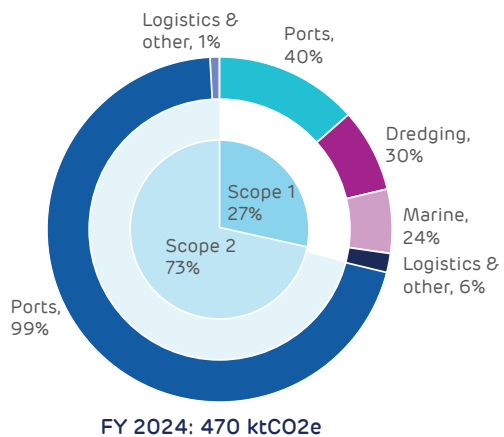
Three pillars of climate strategy

		
<h3>Reduce our impact</h3> <p>Through low carbon pathway commitments, reduce emissions in operations and supply chain.</p>	<h3>Building resilience</h3> <p>Enhance physical and strategic resilience of our operations and key stakeholders.</p>	<h3>Strengthen the system</h3> <p>Develop robust system to track and ensure integration of climate change in relevant business activities.</p>

Emission Breakdown in FY 2024

The total scope 1 & 2 emissions of APSEZ were 470 ktCO₂e in FY 2024 of which 73% was Scope 2 emissions from electricity use and the rest was scope 1 emissions from fossil fuel consumption. Almost entire (98.9%) scope 2 emissions were in the port business with only a small amount (1.1%) coming from logistics business that involves warehousing, trucking, logistic parks and railway rolling stocks. The scope 1 emissions were split between port (40%), marine (24%) including tugboat operations, dredging (30%) and logistics (2%) businesses as shown in the chart here.

With the switch to renewable electricity, we are able to take care of 71% of the total scope 1 & 2 emissions of APSEZ. However, due to anticipated high cargo volume increase driven by country's robust economic growth expected.

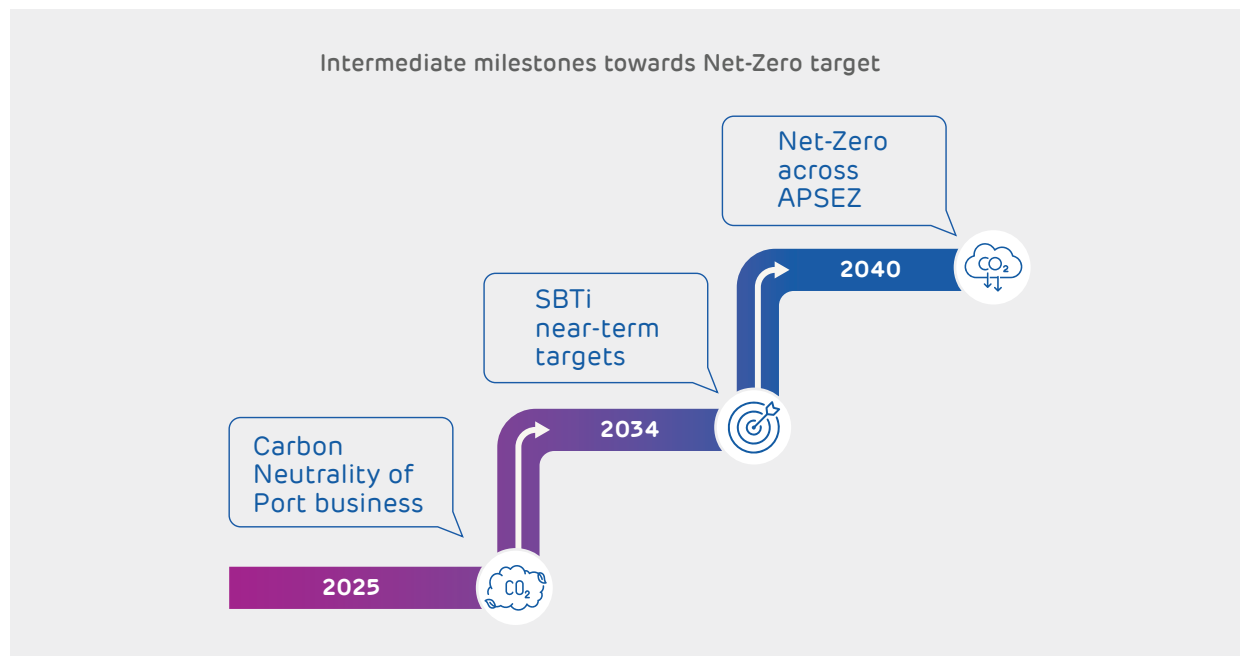


Net-Zero Commitment

As a member of the Climate Ambition Alliance, we have committed to take up net zero emissions target and make our contribution towards limiting the global temperature rise to 1.5°C Celsius. Actually, by setting the target to achieve APSEZ-wide Net-Zero by FY 2040, we have gone beyond the 2050 timeline given under various climate scenarios for Net-Zero. APSEZ's industry leading climate ambitions is a hallmark of the way we do business- where sustainability and growth go hand in hand.



For the near term, we target to achieve Carbon Neutrality of the port business by 2025. We align with science-based target and have committed to seek validation of the target and the action plan to achieve the target by the Science Based Targets initiative (SBTi).



Our water stewardship emanating from climate change concerns

Water is an important input to us, however, our key port operations are located in water stressed regions with likelihood of climate change further impacting their availability in future. To achieve water stewardship, we have endorsed the United Nations CEO Water Mandate and committed to reduce dependency on shared water resources by improving efficiency and exploring alternate sources like recycled industrial waste water, desalination and rainwater harvesting. Our target is to reduce our dependence on shared water resources to less than 20% and improve our water intensity of revenue by 60% in FY 2025 from the FY 2016 levels.

Water Stewardship
UN CEO Water Mandate

20%
or less of shared water resources

60%
intensity improvement

Climate Action Plan

Climate action is a critical component of our sustainability efforts. As an organization we recognise that the impacts of climate change pose risks to our business, as well as to the communities and environment in which we operate. We have consistently conducted our business according to our climate strategy, ensuring alignment with our near- and long-term commitments and compliance with regulations in all the jurisdictions applicable to our operations. We have developed a comprehensive climate action plan to keep us on the path to achieving Net Zero by FY 2040. The action plan is set with certain view of the low-carbon technology maturing over time and becoming economically viable, like for hydrogen generation and use, battery storage, etc. We keep evaluating and updating our action plan to take the optimal decarbonization path with a view of the intermediate milestones of achieving 'Carbon Neutrality of the Ports' in FY 2025 and 'SBTi Near-term target for APSEZ' in FY 2034.

Carbon neutrality by 2025

APSEZ's Carbon Neutrality target for FY 2025 sets the short-term milestone for its port business which is, possibly, the most ambitious near-term target by any port company. The objectives under the carbon neutrality target are to:

- Reduce energy intensity of revenue by 50% from FY 2016 baseline
- Switch away from fossil fuel with electrification of equipment like RTGs, MHCs and ITVs
- Source the maximum feasible electricity demand from renewable sources
- Offset the remaining emissions through carbon sequestration initiatives, particularly through mangrove afforestation, as they are considered to be amongst the best carbon sinks. Additionally, the carbon credits of the renewable electricity generated from 1,000 MW capacity currently under development, will be used to offset the remaining scope 1 & 2 emissions in FY 2025. The renewable capacity is expected to be completed before 2025



Carbon neutrality

Energy efficiency:
lower intensity by 50%



Electrification of equipment



Source renewable power



Offset with carbon credits

Scope of emissions reduction

The Carbon Neutrality emission reduction goal covers both the Scope 1 and Scope 2 emissions from our port operations. We also have measures to reduce our scope 3 footprint, even though, we do not have any specific scope 3 target for FY 2025.

- (i) Our Scope 1 includes direct emissions from fuel used in port operations in equipment like cranes, excavators, dozers, reach stackers and forklifts etc. and in allied activities like harbouring, dredging and in DG sets and Company vehicles.

- (ii) Scope 2 (location based) includes indirect emissions from purchased electricity consumed by the operational activities.
- (iii) Scope 3 emissions include emissions from upstream, downstream, supply chain, investments and business travel.

Targeting steep emission cut with mitigation measures

APSEZ is leading the sector in climate action with its commitment to achieve Carbon Neutrality of ports in FY 2025 and Net Zero of all businesses in FY 2040. In order to achieve these ambitious targets, the company is collaborating with various OEMs to implement measures on energy efficiency, electrification and switch from fossil fuel to other green energy. Some of these measures have already been implemented or initiated and the rest are under discussion with various OEMs.

Electrification and energy efficiency

- A total of 338 electric E ITVs were deployed across various locations for port operations and a fleet of nine Tata Nexon EVs was introduced to facilitate employee travel. Additionally, nine diesel cranes were electrified and with that almost all the cranes in operation at different sites are now electrically driven
- Besides adopting innovative options, we are also investing into conventional solutions to cut our Scope 1, 2 and 3 emissions. Example: Ceramics transportation from Morbi in

Gujarat is now through railways vs. road earlier, which will result in GHG emissions reduction in excess of 50,000 tons by 2025, equivalent to taking 20,000 cars off the road.

- Railway electrification of Adipur-Mundra line led to replacement of diesel loco with electric alternatives that will reduce 6 million tons of CO2 emissions every year
- We have undertaken a conversion of the high-pressure sodium vapor lamps (HPSV) in all RTG cranes to LED fittings and through other initiatives with the objective of reducing CO2 emissions and optimizing operational costs. This resulted in a reduced carbon emission per annum of 47,815 Kg CO2e

Large-scale renewable capacity

Installation of overall 1,000MW new solar and wind capacity is ongoing and is expected to be completed in 1-2 years. While the renewable power generated from the power plant will be used to meet internal demands to the extent feasible, intermittency of supply and non-availability during certain time of the day implies, we may not be able to completely fulfil our requirements with renewable electricity currently. To meet Carbon Neutrality target, a part of the electricity generated will be sold as brown power and the carbon credits generated thereof will be withheld to offset the residual emissions from our operations. The remaining renewable electricity will be sold as green power.

The emission offset with carbon credits is a gap-fill measure until viable technologies emerge to enable us increase renewable electricity share to 100%. We are striving for a mix of technologies to target close to 100% electricity supply by developing hybrid sources like solar and wind and making a provision for battery storage to ensure higher availability of renewable supply. This hybrid mix of renewable technologies is aimed at taking the plant load factor (PLF) closer to 60-70% and improving reliability of power supply.

Besides, we have also collaborated with the OEMs to provide them with a launching pad to test and develop their products with months of pilot operations at some of our key ports. We are in discussion with some other solution providers to be the first in the country to procure some of the newly launched low carbon solutions (early-stage products).

Fuel-switch pilots ongoing or under consideration

- Piloting of Hydrogen Based Tugs
- Fuel catalyst for tugs
- Battery operated tugs
- Electric locos (shunter)
- Battery operated reach stacker and ECH

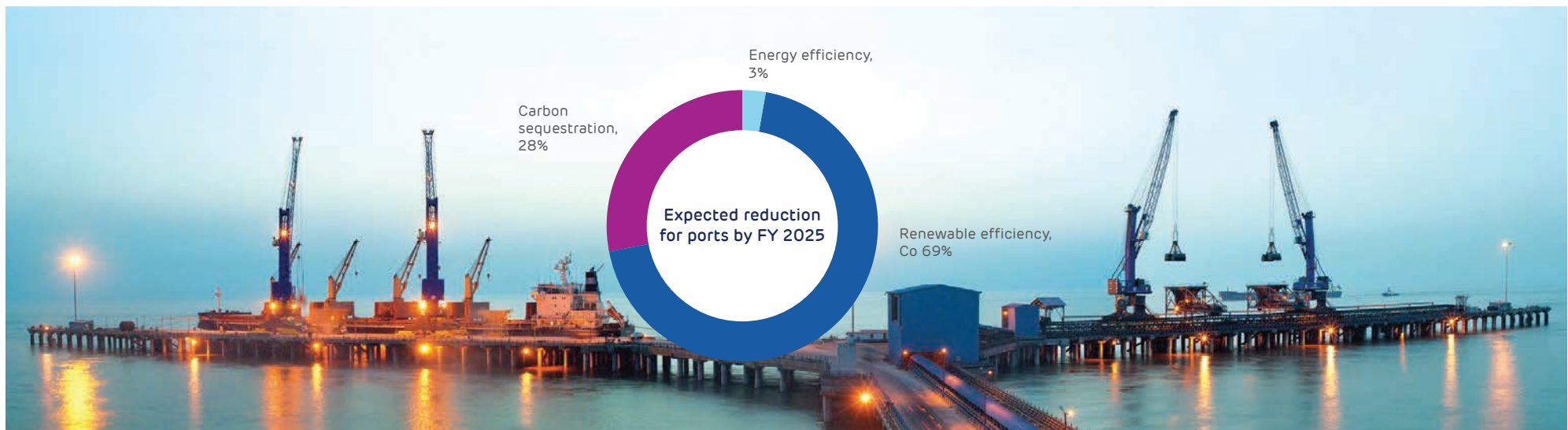
Nature based solutions for emissions offset

- 1) 4,240 Ha of mangrove afforestation has been done as of FY2023-24 end. Mangrove is considered to be a high-quality sink of carbon with potential sequestration of 20-30tCO₂/ Ha
- 2) Additionally, we have done terrestrial plantation of 1267 Ha as of FY2023-24 end

Breakdown of expected emissions reduction by 2025

We are estimating emission reduction on the following lines

- (i) Around 3% reduction in energy demand from efficiency initiatives, including LED lighting and use of more energy efficient equipment.
- (ii) Around 69% emissions reduction by sourcing the electricity supply from renewable sources by using a combination of renewable technologies (wind & solar) at our ports and using renewable electricity-based carbon credits; and
- (iii) Offsetting the remaining 28% emissions through carbon sequestration



SBTi 'Near-term' target for FY 2034




APSEZ has signed up with the Science Based Target initiative (SBTi) and committed to setting science-based emissions reduction targets for its entire value chain that are consistent with keeping global warming to below 1.5°C above pre-industrial levels. In accordance with the commitment and the requirements of SBTi, the Company has come up with an emissions reduction plan for the next ten, i.e. FY2034, which will be submitted to the agency for its approval. The implementation of some of the measures, like installation of renewable capacity and electrification of equipment, has already been initiated.

The plan relies on the strategy of improving the energy efficiency of operations, electrification of fossil fuel-based equipment and use of renewable sources to meet power demand for near complete decarbonization of electricity we use. For renewable electricity, we have already initiated work on 1,000 MW solar and wind based captive power generation which will be enough to meet the requirement, according to our estimates.

The plan for fuel switch involves transition from fossil to electricity or use of green hydrogen/ ammonia (green fuel) which could find better application in heavy duty trucks, excavators, dozers, tugboats and dredgers in

future. The zero emissions green fuel to be used in our operations will be produced using renewable electricity.



APSEZ decarbonization strategy

-  Energy efficiency
-  Switch from fossil fuel to electricity or green hydrogen or ammonia
-  Renewable power for decarbonization of electricity used

Low-carbon Transition of Equipment

Low Carbon product(s) or service(s) Our services encompass cargo handling, including bulk, breakbulk, containerized, and liquid cargo, facilitated by modern equipment. All these equipment consumes high amount of energy to transfer the cargo from one location to another location. Almost all of the equipment is converted to electric based from the fossil fuel operated. the services provided at Kattupalli port uses the renewable electricity generated at the site itself.

Note: APSEZ is not legally required to align its services to any sustainability taxonomy because India neither mandates nor has any sustainability taxonomy framework.

-  Revenue through Low Carbon services in FY 2024 - 6.6%
-  Emissions Avoided in FY 2024 - 50,028 TC02e

Internal carbon pricing

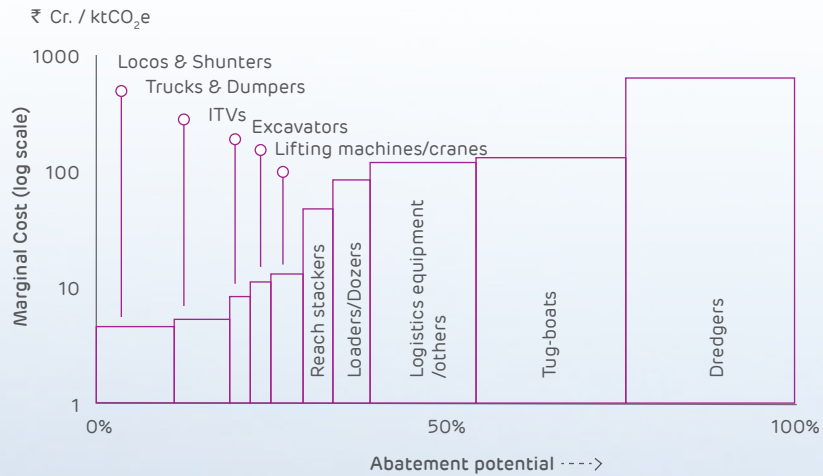
Internal carbon pricing helps our organisation reduce GHG emissions, navigate Change internal behavior, Drive energy efficiency, Drive low-carbon investment, Identify and seize low-carbon opportunities, Navigate GHG regulations, Stakeholder expectations, Stress test investments, Reduce supply chain emissions, supplier engagement and mitigate the potential financial impacts of existing and anticipated GHG regulations, drive low carbon investments and energy efficiency within the organisation. At APSEZ, prior to project implementation, we conduct a thorough evaluation of greenhouse gas (GHG) projects from a financial perspective. If the projected GHG emissions are high, we prioritise the assessment of better technologies that can help reduce emissions. This approach ensures that our projects not only meet financial objectives but also contributes to environmental sustainability by actively seeking and adopting cleaner and more efficient solutions. We also leverage ICP as a strategic tool to align with stakeholder expectations and catalyse behavioural changes within our operations. APSEZ has implemented an internal carbon pricing mechanism, applying a price of US\$ 20 per metric ton of CO2 equivalent (tCO2e) on all Scope 1 and Scope 2 emissions from its operations. The Company sets aside an equivalent cumulative amount for investment in renewable projects and energy efficiency measures.

Expected technology to achieve energy efficiency & low carbon transition

Equipment	Transition technology	
	Retrofitting	Replacement
Loco & Shunter	Electricity	Electricity
Truck/ Dumper	H2ICE	FCEV
ITV	Electricity	Electricity
Loader/ Dozer	H2ICE	FCEV/ H2ICE
Reach stacker	H2ICE	FCEV/ H2ICE
Excavator	H2ICE	FCEV/ H2ICE
Other equipment, vehicles, etc.	H2ICE retrofitting (for heavy duty vehicles)	FCEV/ H2ICE (heavy-duty vehicles/ equipment); BEV/ charging infra (light to medium duty vehicles)
Tug-boat	H2ICE	Battery/ FCEV/ H2ICE
Dredger	ICE with H2 or other low carbon fuels like ammonia, biofuel, etc.	
Logistics: vehicles & equipment	H2ICE retrofitting (for heavy duty vehicles)	FCEV/ H2ICE (heavy-duty vehicles/ equipment); BEV/ charging infra (light to medium duty vehicles)

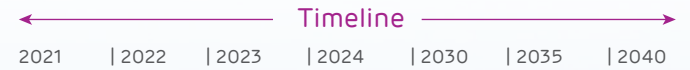
ICE= Internal Combustion Engine; H2ICE= Hydrogen based ICE; FCEV= Fuel Cell Electric Vehicle; BEV= Battery Electric Vehicle; H2= Hydrogen

Cost vs. emission abatement potential



Expected timeline of fuel-switch

What to transition?



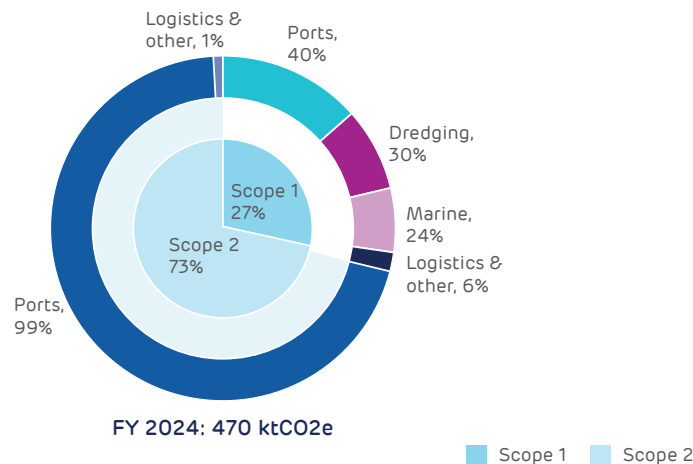
Forecasted emissions (FY 2034)

The GHG emissions of various business units in FY 2024 and projection to FY 2034 are shown in the table below. We have assumed at least 90% of the electricity requirement across the business units will be met with renewable electricity. All the other assumptions made to arrive at the emissions reduction and the sensitivity to key indicators are also mentioned in the subsequent table. Based on our calculation, we will achieve 53% reduction in total scope 1 & 2 emissions by FY 2034.

Emissions (KtCO2e)	FY 2024			FY 2034 Projected			Change (in total)
	Scope 1	Scope 2	Total	Scope 1	Scope 2	Total	
Ports	51	339	390	19	63	82	-79%
% Contribution	40%	99%	83%	12%	93%	37%	
Marine	30	0	30	58	2	60	99%
% Contribution	24%	0%	6%	37%	3%	27%	
Dredging	37	0	37	78	0	78	108%
% Contribution	30%	0%	8%	50%	0%	35%	
Logistic & Others	8	4	12	0	3	3	-76%
% Contribution	6%	1%	3%	0%	4%	1%	
Total- APSEZ	124	343	467	155	68	223	-53%



We forecast a 53% decline in scope 1 & 2 emissions by FY 2034



Key assumptions

We have assumed a 14% annual growth in port volume and a similar growth in marine operations which will help us reach close to 1,500MMT cargo volume in 10 years. Since dredging of the vessels' navigation channel is a routine maintenance exercise and is less dependent on higher cargo volume growth, we have assumed a 10% y-o-y increase in its operations over the next 10 years. On the contrary, since logistics is a high growth business for us, we have penciled in a 16% y-o-y growth in its operations.

We have built in an overall 20% improvement in energy efficiency to arrive at the lower end of the estimated emission reduction with the initiatives planned until 2034. There has been a higher, 12%, improvement in overall energy intensity of the port business with respect to cargo volume handled in the last 4 years.

We plan to completely switch to renewable electricity over the long term and have assumed that at least 90% of the electricity demand in 2034 will be met through renewable electricity. Our estimate of emissions reduction is most sensitive to the share of renewable electricity targeted for FY2034. A +/-100 bps change in the share of renewable electricity results in +/-174 bps change in the final emission reduction, i.e. if the share of renewable electricity rises to 91%, we can achieve an APSEZ-wide emission reduction of 53% by FY 2034. With a 100% renewable electricity share by FY 2034, the overall reduction in emissions could be about 67% from the current level. Hence, there remains

a significant upside to emission reduction if we increase the renewable share further. A 50% improvement in grid emission intensity is also assumed, given the high growth of grid

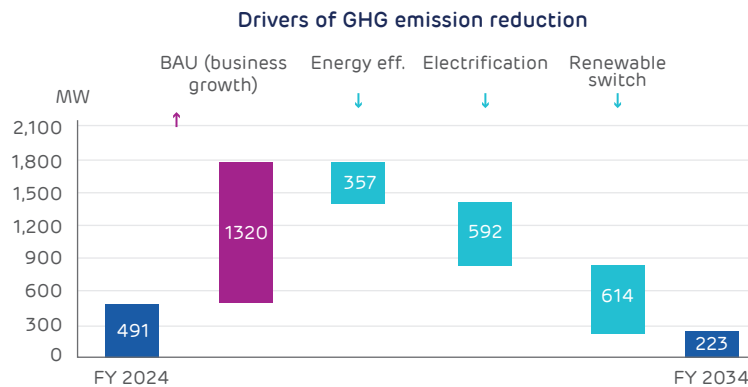
connected renewable expected in future. The grid intensity in the US and Europe is already less than half of the Indian value.

Parameters	Assumption	Sensitivity
	FY 2034	Bps change in emissions per +/- 100 bps change in the parameter
Renewables share	90%	+/- 174
Grid emissions factor improvement	50%	+/- 36
YoY energy intensity improvement	2%	+/- 20
CAGR- port operation	16%	-59/+58
CAGR- marine operation	16%	-45/ +44
CAGR- dredging operation	10%	-20/+20
CAGR- logistics operation	20%	-3/+3
Electrification level in ports	90%	+/- 85
Electrification level in marine	33%	+/- 14
Electrification level in dredging	33%	+/- 9
Electrification level in logistics	100%	+/- 18

Note: Sensitivity measured with +/- 1% change in the value of the specific parameter keeping all the other parameters constant. For example, sensitivity of renewables share is the percentage change in overall APSEZ-wide emissions when the share increases +1% to 90.9% and -1% to 89.1% by FY 2034.

Factors causing emission reduction

In summary, there are four key factors causing emissions change that we are anticipating: 1) volume growth that will lead to increase in emissions, 2) improvement in energy efficiency which will reduce emissions, 3) electrification that will result in overall emissions reduction as the grid becomes less emission intensive, and 4) the highest reduction in emissions will be achieved through switch to renewable electricity. The chart below shows the changes brought about by each of these drivers which add up to the total reduction in emissions. With the expected rate of growth, the business-as-usual scope 1 & 2 emissions of APSEZ in FY 2034 will be more than 3x of the current value.



Required renewable capacity

Growing requirement to meet the electricity demand from operations and shore-power to the ships calling the ports will help reduce scope 2 and scope 3 emissions respectively.

The renewable capacity requirement will be well over 1,000 MW with investment of over ₹ 6,000 crore.

Mitigation of Scope 3 Emissions

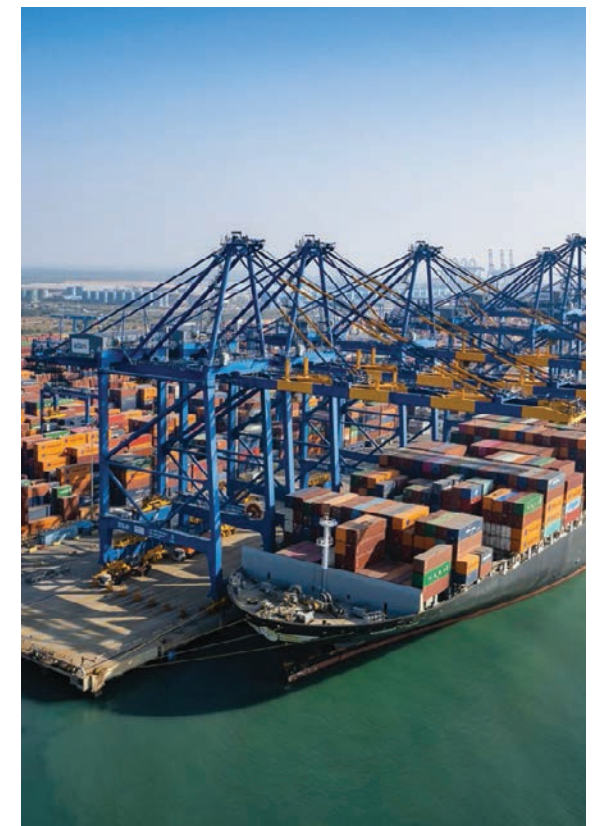
As a part of our climate target, we have a scope 3 emission reduction plan with certain initiatives for scope 3 already being implemented. The company offers 50% reduction in fees for ships calling its ports for using LNG as fuel. Another initiative, currently being piloted, is to supply shore power to the ships by sourcing electricity from the renewable supply.

Operational control for supply chain

APSEZ recognizes the importance of addressing Scope 3 emissions from the upstream and downstream supply chain. To determine the scope 3 emissions, we have applied operational control criteria. Accordingly, the emissions in the supply chain are included in APSEZ's inventory if the Company can influence the emission sources through procurement decisions, supply chain management, and engagement with suppliers and partners. We can reduce emissions with our purchase decisions if low carbon alternatives are available for the products and services we use, or if we are able to drive change and improve emission performance of the suppliers by continuously engaging with them.

Scope 3 calculation methodology

We use primary source data and apply the GHG Protocol Scope Standards to arrive at different categories of scope 3 emissions. We identify and monitor large emission sources along our value chain and report our value chain emission performance.



Scope 3 Category	Our Activity	Method of accounting
Purchased goods and services	Goods & services purchased during the year for operations	Spend-based method; industry emission factor (I/O analysis)
Capital goods	Capital goods purchased during the year	Spend-based method; industry emission factor (I/O analysis)
Fuel & energy related activities (not included in Scope 1 or 2)	Well-to-tank and T&D losses for electricity consumed; well-to-tank of own use of fuel	Actual electricity and fuel consumption; av. T&D losses; emission factors: grid (location based); av. well-to-tank for fuel
Upstream transportation and distribution	Fuel consumed by ships calling the port; contract operations	Actual quantity of fuel used; emission factor of fuel used
Waste generated in operations	Emission from third-party waste disposal & treatment	Actual waste quantity; waste treatment method; emission factors
Business travel	Business travel via air, rail and road	Actual distance travelled; emission factor per pkm
Employee commuting	Daily commute by employees	Actual distance traveled; public/ private transport; emission factor
Upstream leased assets	Not applicable	
Downstream transportation and distribution	Hinterland transport via rail & road	Actual distance travelled; mode of transport; emission factor per ton-km
Processing of sold products	Not applicable	
Use of sold products	Not applicable	
End of life treatment of sold products	Not applicable	
Downstream leased assets	Buildings leased to other businesses	Actual electricity consumption; grid emission factor (location based)
Franchises	Not applicable	
Investments	Fuel & electricity used in JVs	Actual fuel/ electricity consumption; emission factor
Other downstream	Not applicable	
Other upstream	Not applicable	

Scope 3 emissions and mitigation measures

1,887 ktCO2e	Scope 3 category	Key drivers for emission reduction
	Category 15: Investments (2.5%)	Eqp. electrification, renewable power
	Category 13: Downstream leased assets (0.6%)	Renewable power efficient lighting & workstation
	Category 9: Downstream transportation & distribution (6.0%)	Support electrification/ low-carbon fuel-switch
	Category 7: Employee commuting (0.1%)	Incentivise EV adoption, provision for charging
	Category 6: Business travel (0.03%)	Online meetings, virtual site tour
	Category 5: Waste generated in operations (0.02%)	Waste recycling & reuse, zero-waste to landfill
	Category 4: Upstream transportation & distribution (18.1%)	Shore power to the ships, renewable electricity
	Category 3: Fuel - and energy- related - activities (3.4%)	Renewable electricity
	Category 2: Capital goods (52.0%)	Improved productivity; emission criteria in purchase decision; energy system decarbonisation
	Category 1: Purchased goods & services (17.4%)	Improved productivity; emission criteria in purchase decision; energy system decarbonisation

Scope 3 emissions in FY 24

Note: Not-Applicable categories are Cat 8: Upstream leased assets, Cat 10: Processing of sold products, Cat 11: Use of sold products, Cat 12: End of life treatment of sold products, Cat 13: Franchises, Cat 14: Other downstream, Cat 15: Other upstream

Scope 3 targets

We have set targets for a selected categories of scope 3 emissions for which the emission reduction drivers are under our control. For example, with our purchase decision, we prioritise low-carbon products and services and drive vendor actions on climate change.

To calculate category 1 and category 2 emissions, we used amount spent on operations and capital formation respectively and multiplied the respective spend data with the sector-wise emission factors. The two categories together accounted for nearly 70% of our scope 3 emissions in FY2024. Along with

our efforts to reduce emissions embedded in our purchases, the low-carbon transition in the sectors like capital goods, heavy equipment, etc. will reduce a significant share of our category 1 and 2 emissions.

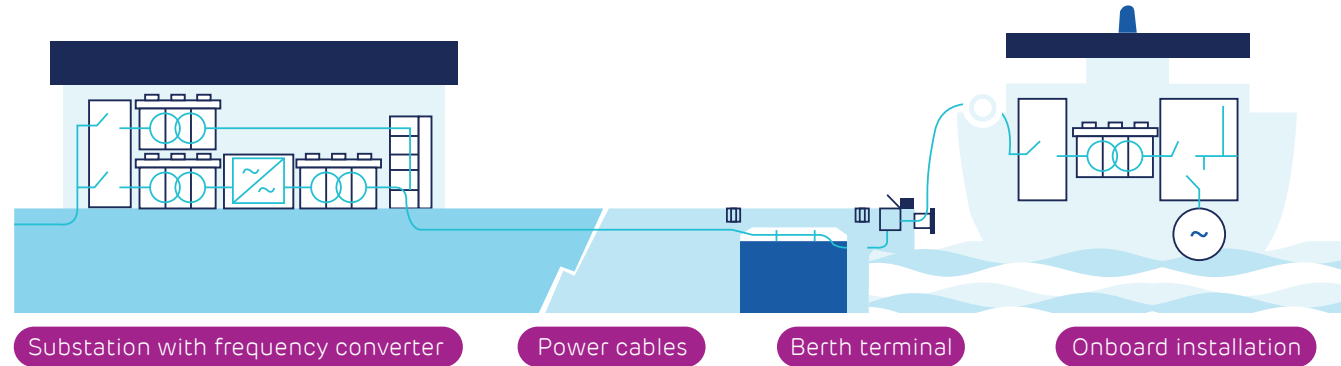
Scope 3 goals for 2034

Scope 3 category	2034 target
Purchased goods and services	<ul style="list-style-type: none"> - All purchase decision to consider life-cycle emissions of products and services being procured - 20% reduction in emissions intensity of purchase
Capital goods	<ul style="list-style-type: none"> - Reduce capex intensity with higher capacity utilization - All purchase decision to consider life-cycle emission of the products or services being procured - 30% reduction in emissions intensity of purchase
Fuel - and energy- related - activities (not included in Scope 1 or 2)	<ul style="list-style-type: none"> - At least 90% electrification of the port equipment - At least 90% renewable electricity share
Upstream transportation and distribution	<ul style="list-style-type: none"> - Renewable shore-power supply to at least 50% of > 10,000TEU and 90% of the rest of the container and RORO vessels
Waste generated in operations	<ul style="list-style-type: none"> - At least 30% reduction in emissions intensity of waste disposal through recycling & reuse and zero-waste-to-landfill initiatives
Business travel	<ul style="list-style-type: none"> - 10% less business travel from business-as-usual (BAU) levels
Employee commuting	<ul style="list-style-type: none"> - 60% reduction in emission intensity per employee by incentivizing EV adoption and providing charging points at company provided parking lots
Downstream transportation and distribution	<ul style="list-style-type: none"> - 100% electrification of rail transport, at least 80% EV or low-carbon switch for road transport
Downstream leased assets	<ul style="list-style-type: none"> - 100% renewable electricity use in leased office building
Investments	<ul style="list-style-type: none"> - At least 90% renewable electricity switch and electrification of fossil fuel-based equipment in JVs

Shore power

We are committed to developing infrastructure for renewable electricity-based shore power supply once reliable and economically viable technologies and conducive regulatory framework develop for the initiative. With the shore power facility, vessels can switch off their engines and plug into the shore-side electric grid to cut down on their GHG emissions together with achieving a significant reduction in the noise level at the port. The key challenges that the shore power adoption currently face are:

- High capital cost for network capacity upgrades, reinforcement, groundwork and other infrastructure development inside the terminal
- High electricity price which makes it costlier for the ships to switch to shore power in comparison to marine fuel
- Need for a port emission control regulation (like zero emission standard) which would give certainty to investors for shore power development and divide the cost between different industry players, like shipping lines, ports and customers. Additionally, incentive measures would induce initial capital investment by the ports.



We expect the regulatory framework to evolve in the near term to facilitate shore power supply. As a part of 'Green Port Guidelines', Indian government has provided guidance on port-side shore power infrastructure development and has also talked about future incentive measures that the government may put in place for green fuel use (including shore-power) by the ships at the port.

Shore-power implementation

To test the technology, pilot projects were carried out at Mundra and Dhamra port sites and further implementation plans are being developed. We aim to meet the energy requirement of at least 20% of the container (incl. RORO) vessels that will call our ports in FY 2034.

For the vessels to have a plug-in option, necessary vessel-side power systems need to exist. Based on the adoption of vessel-side power infrastructure, container and roll-on roll-off (RORO) vessels are most suited for shore power transition. In FY 2024, Mundra port alone handled 77.2% of APSEZ's and 33% of India's total container volume.

The quantity of FO/DO fuel burnt by the container ships at the Mundra port was 56% of the total 71.4 kilo ton in FY 2024. This resulted in about 125 ktCO₂e of emissions in FY 2024 which translates to 1.3 kgCO₂e GHG emissions per ton of container cargo handled.

Projected Scope 3 emissions

Based on the category-wise targets, we have estimated the FY 2034 scope 3 emissions at around 4,137 ktCO₂e which is more than double the value in FY 2024. The emission intensity per unit of cargo handled (port operations being a significant contributor) is expected to reduce by 55%, since the volume of cargo is expected to increase to 4.4 times the current level in the next decade. The tough-to-reduce emissions would be those embedded in the purchased goods and services, including capital goods. We look to target low carbon alternatives through our purchase decision and further expect the low-carbon transition of the energy system and the overall economy to lower the embedded emissions in the product and services we purchase.

Scope 3 sources		Absolut emissions (ktCO ₂ e)				Intensity/ cargo (tCO ₂ e/ MMT)		Change
		FY 2024	Share	FY 2034	Share	FY 2024	FY 2034	
Purchased goods and services	Category 1	328	17%	328	26%	966	650	-33%
Capital goods	Category 2	982	52%	2,377	64%	2,895	1,590	-45%
Fuel and energy related activities	Category 3	64	3%	18	0%	189	12	-94%
Upstream transp. & distrib.	Category 4	341	18%	126	3%	1,006	85	-92%
Waste generated in operations	Category 5	0	0.02%	1	0%	1	0	-58%
Business travel	Category 6	0	0.03%	1	0%	1	1	-32%
Employee commuting	Category 7	1	0.07%	2	0%	4	1	-66%
Downstream transp. & distrib.	Category 9	113	6%	216	6%	333	144	-57%
Downstream leased assets	Category 13	12	1%	0	0%	34	0	-100%
Investments	Category 15	46	2%	9	0%	137	6	-96%
Total		1,887		3,722		5,567	2,489	-55%

Investments to Meet Climate Ambition

Investments in FY 2023: Our attempt to address technology risks is now leading us to opportunities with our mitigation measures. In FY 2023, around ₹ 384 crore was spent on electrification of equipment of which ₹ 347.7 crore alone was spent to purchase electric ITVs and to develop infrastructure for its charging and maintenance. The e-ITVs have a payback of 4-5 years post which the project will give us a positive return. The spending on electrification of cranes and other equipment was to the tune of ₹ 19.9 crore and on the conveyer system of ₹ 16.7 crore in FY 2023 which have a payback of about 3 years.

Around ₹ 331 crore of the capex was on different rail projects like electrification and upgradation of existing lines and equipment, which helped reduce energy use though modal shift and efficiency improvements. We achieved emissions reduction by shifting ceramics transportation from Morbi to Mundra in Gujarat from road to railway. This will reduce GHG emissions more than 50,000 tons by FY 2025, equivalent to taking 20,000 cars off the road. We made investments of ₹ 5.4 crore in various solar power projects and ₹ 8.6 crore in projects linked to water and wastewater treatment, storm water discharge and water efficiency measures.

Investment in FY 2024: The Company invested ₹ 1,493 crore on projects related to electrification of equipment, rail infra, energy efficiency, emission reduction, environment protection, water management, waste treatment and

adaptation to climate change. This investment includes ₹ 907 crores spent on purchase of electric equipment at the greenfield and expansion projects.



Climate Vulnerability and Adaptation Plan

Climate-related risks and resilience strategies identified in the adaptation plan are highly relevant and are always included in discussions related to APSEZ's growth strategy due to the magnitude of associated financial impacts

Physical Risk Assessment

APSEZ has conducted Climate Change Vulnerability Risk Assessment of the infrastructure related to port operations through a third-party expert agency that provided assessment of the vulnerability and exposure of the assets and carried out adaptation response development based on the guidelines suggested by IPCC and the best practices for climate risk analysis.

The assessment was revised in FY 2024 by updating the analysis with the latest climate model outputs and scenarios to identify climate-related risks due to physical hazards (acute and chronic). An additional scenario corresponding to less than 2oC warming scenario (SSP1-RCP2.6) was added in addition to the analysis initially conducted using more than 2oC of warming scenario (SSP2-RCP4.5) for two-time frames (2021-2050 & 2041-2070). The changes in acute physical hazards (in terms of severity and frequency) and long-term changes in chronic hazards are quantified with respect to the baseline period to identify the impacts of changes in the likelihood of identified risks on APSEZ's direct operations. The assessment subsequently identifies potential financial implications on APSEZ's direct cost, revenue, expenditure, and other indirect costs. Significant risks and associated impacts were identified at an asset level at each port corresponding to the physical climatic hazards.

We also conducted a comprehensive port-wise climate adaptation planning assessment for 13

ports and terminals (including Vizhinjam and Colombo) providing implementation timeframe and expected cost implication of adaptive measures. Impact-specific adaptation measures for assets under high and very high-risk categories were identified and are being implemented in a phase-wise approach for the ports with high vulnerability to identified climatic risks (based on the outcomes of relative climate vulnerability-risk assessment study for 13 ports and terminals).

Climate-related risks and resilience strategies identified in the adaptation plan are highly relevant and are always included in discussions related to APSEZ's growth strategy due to the magnitude of associated financial impacts to respond to the risks posed by changes in chronic climatic hazards.



Summary of Physical Risk Assessment Analysis

Physical Risk	Financial Drivers	Impact Level			Strategy to Mitigate/Response to Risk
		Short term	Medium term	Long term	
Acute Risk Extreme Weather Events: Storm Surge, Cyclone	Increased indirect (operating) cost	Medium	Medium -High	Medium -High	<p>APSEZ has prepared a comprehensive port-wise adaptation plan with a compendium of proposed adaptation measures that primarily focus on operational and engineering-based solutions. Most of these measures can be incorporated into our regular activity timelines, with around 50% of them achievable in the short to medium term.</p> <p>APSEZ have invested. ₹ 127.2 crores in various adaptation measures, including ₹ 26.3 crores for engineering, building adaptive capacity, and ecosystem-based measures, and a significant investment of around ₹ 100.7 crores was made in operational measures.</p>
Acute Risk Tropical Cyclone	Increase insurance coverage related cost	Medium	Medium -High	Medium -High	<p>Climate change adaptation plans include adaptation measures enhancing infrastructure resilience, development of the emergency plan and establishment of early warning system.</p> <p>In response to the increasing occurrence of tropical cyclones impacting port assets, APSEZ has decided to enhance its insurance coverage to safeguard financial stability and ensure minimal disruptions to operations and infrastructure.</p>
Chronic Risk Sea Level Rise	Increased indirect operating cost	Low	Medium	Medium	<p>APSEZ has proposed mitigation measures specific to sea level rise which includes constructing seawalls and breakwaters, raising the elevations of critical port infrastructure including berths, terminals etc.</p>

Physical Climatic Hazards	Scenarios	Impact with respect to Baseline (All ports and terminals)		Impact with respect to Baseline (Ports and terminals along Western Coastline)		Impact with respect to Baseline (Ports and terminals along Western Coastline)	
		Short- to Medium-term (2021-2050)	Long-term (2041-2070)	Short- to Medium-term (2021-2050)	Long-term (2041-2070)	Short- to Medium-term (2021-2050)	Long-term (2041-2070)
Acute	Inland Floods	SSP1-RCP2.6 SSP2-RCP4.5					
	Flash Floods	SSP1-RCP2.6 SSP2-RCP4.5					
	Heatwaves	SSP1-RCP2.6 SSP2-RCP4.5					
	Cyclone	SSP1-RCP2.6 SSP2-RCP4.5					
Chronic	Water Stress (Change in Precipitation)	SSP1-RCP2.6 SSP2-RCP4.5					
	Heat Stress (Change in Temperature)	SSP1-RCP2.6 SSP2-RCP4.5					
	Sea Level Rise	SSP1-RCP2.6 SSP2-RCP4.5					

Impact Level	Colour Category	Description of impact
Very Low Impact		Ports and terminals not exposed or not significantly exposed to historical or projected risks
Low Impact		Few ports and terminals exposed to historical or projected risks
Moderate Impact		Majority of the ports and terminals exposed to historical or projected risks
High Impact		Majority of the ports and terminals significantly exposed to historical or projected risks
Very High Impact		All ports and terminals significantly exposed to historical or projected risks

Adaptation Plans

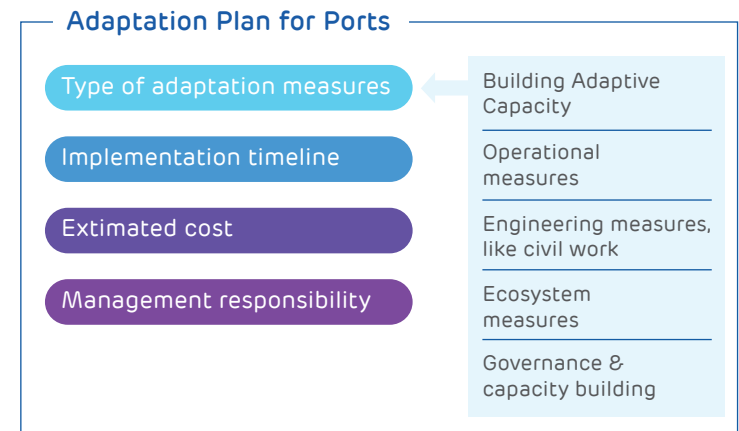
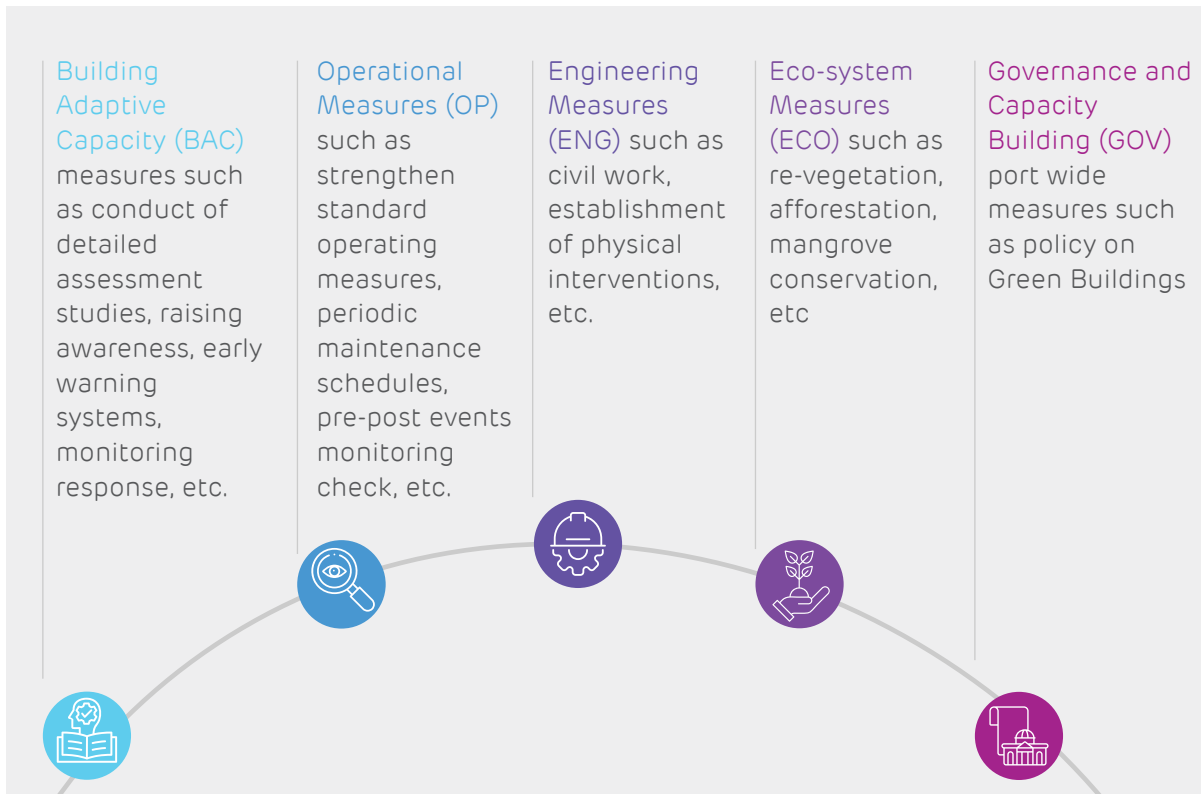
Significant risks that were identified for the four ports (Mundra, Dhamra, Hazira and Krishnapatnam) during the detailed climate risk assessment study included inundation due to increase in precipitation and sea level rise, timetabling delays due to high winds, etc.

A broad Adaptation Plan was developed to address the significant climate risks (Very

High Risks and High Risks) through adaptation measures for each of the 4 ports. The adaptation plan considers cost of implementation against cost of no action and takes into account the probability of tail events and the estimated loss during such events. The adaptation measures proposed were classified into:

The Adaptation Plan for the ports included the following components:

- a) Type of Adaptation Measure
- b) Implementation Timeline (Short term, Medium Term, Long Term, Regular)
- c) Cost (Low, Moderate and High)
- d) Responsible department for implementing the measure



Timeline for adaptation measures

Some of the adaptation measures proposed in the Adaption Plan were implemented at ports. And remaining are in progress to be implemented. We target to implement relevant adaptation measures within a timeline of 5-10 years for existing operations. The risk assessment and plan to adapt to physical climate risks cover our new operations as well i.e., Krishnapatnam, Dighi, and Colombo.

Mundra Port

Change in precipitation pattern due to climate change is expected to be the primary risk at Mundra port. It will impact operations, causing delays and temporary stoppages. Some of the impacts faced by the port will be muddy conditions, operational delays and difficulty of handling the operations, congestion & difficulty in access, increased loss of water quality and benthic habitat due to increased runoff, maintenance dredging and disposal of dredge material. While, the sea-level rise and storm surge will cause similar impacts, it may create additional challenges like inundation, navigation & berthing, increased maintenance dredging, higher operational downtime, excessive sedimentation, and submergence. Proposed adaptation measures are predominantly operational and engineering-based. The majority of the adaptation measures can be carried out as a part of regular activity timelines. Nearly 50% of these measures can be carried out in the short to medium term. As the interventions essentially need operational actions involving human resources and time involvement, they can be implemented with low investment. Few engineering measures like increasing drainage capacity and raising the elevation of assets to prevent inundation will be finance intensive.

Hazira Port

The primary climate stressor at Hazira is increased precipitation which is expected to cause inundation, Overflow from existing storm drainages, operational delays and difficulty of handling the operations, contamination of cargo, damage to infrastructure & components, timetabling delays, difficulty in access to the port. Operational delays and inundation are the two highest impact areas where crane ship unloaders and water resource systems are at the highest susceptibility level. More than one-third of the adaptation measures at Hazira will be operational measures, which would be taken up as a part of the regular activities and would have low-cost implications. The next significant action needed is the BAC and engineering measures like climate proofing of roads, strengthening cranes, ship unloaders, and Stackers. These would require financing at a moderate level and will be implemented in a 1-3 years' timeframe.

Krishnapatnam Port

We have completed the acquisition of the Krishnapatnam port. Unlike Mundra and Hazira, sea-level rise and storm surge are the main climate stressor for the port creating the risk of operational delay, stoppage, inundation and submergence. Jetty and terminal are the most vulnerable asset. At this port, engineering and operational measures will be implemented, followed by building adaptive measures for protection and adaptation of vulnerable assets. Commonly proposed engineering measures are to raise quay heights to prevent flooding, install automated or remote-controlled machinery, install flood barrier gates, and procure mobile DG sets for power backup. About 65% of the measures would require low to medium cost for implementation as a regular course of business and in the medium term, i.e. 1-3 years duration.

Dhamra Port

Dhamra is a deep-water, all-weather port of India in Odhisa, which can accommodate super cape-size vessels. About 30% of the risk at this port is associated with roads, railways and terminals. More than half the measures planned to increase the resilience of this port would entail operational and BAC activities. Nearly one-third of the resilience enhancing activities would be implemented as a part of the regular business operations, whereas another one- third would take place in a 1-3 year timeframe. At Dhamra, some adaptation measures will need implementation immediately, while others can happen in the short term.



Risk Management

Enterprise Risk Management Tool, Managing Climate Risk



Enterprise Risk Management Tool

Risk governance

Over the years, the Company has instituted a systematic risk management approach. The Board has constituted a Risk Management Committee to frame, implement and monitor the risk management plan for the Company. The Committee meets at least once in every quarter to review the risk exposure and risk management plan on behalf of the Board. The Audit Committee has additional oversight in financial risks and controls. The major risks identified by the business are systematically addressed through mitigation actions on a continual basis. At the executive level, business risk management is the responsibility of the Head of ESG (Chief Risk Officer) while the responsibility of monitoring and auditing risk management performance on an operational level lies with the Management Audit & Assurance Services (MA&AS) team which has experienced and professionally qualified accountants, engineers and SAP executives to carry out audits across all functional areas. The MA&AS function directly reports to the Chairman of the Board. The scope of internal audits includes the review of various ESG control processes, performance metrics and data. Along with that we also conduct audits with the help of an external agency.

Risk Identification and assessments

APSEZ employs a thorough climate risk assessment methodology to identify and

assessment of physical (acute and chronic) and transitional climate-related financial risks (current regulation, emerging regulation, technology, legal, market, reputational) covering our own operations, upstream and downstream operation over short, medium and long terms. Also, the potential impact on our business. Our strategy encompasses the management of immediate, medium-term, and long-term risks, ensuring a comprehensive risk oversight that includes the evolving challenge of climate change.

Risk management processes

The ESG Head managing the business risk is answerable to the Risk Committee and reports directly to the CEO to ensure independence from other functions. The Risk Management Committee has three members, all of whom are non-executive directors with two of them being independent directors. All three members of the Risk Management Committee have diverse business experience and vast business risk management exposure.

The Executive Management and/ or Risk Management Committee perform the following functions:

- Periodic review and approval of various business proposals for their corresponding risks and opportunities,
- Guidance over risk supervision, risk

assessment and risk management, including systems for risk assessment and measurement.

- Establish policies, practices and other control mechanisms to contain risks.
- Review and monitor the effectiveness and application of risk management policies, related standards and procedures.
- Review and identify risks in cybersecurity and management.

Features of the Enterprise Risk Management tool

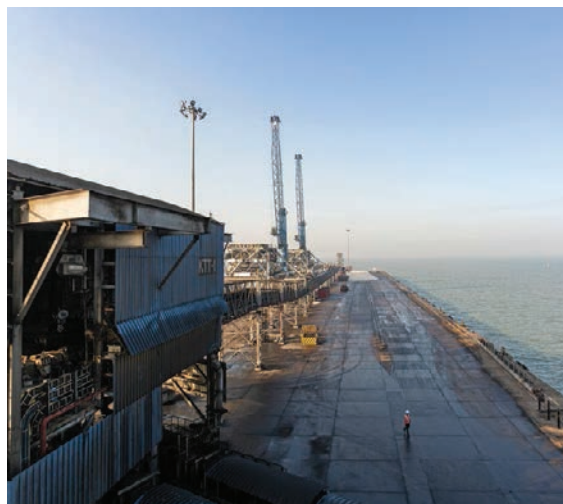
During year, the Risk Management Committee conducted four meetings. APSEZ's Board-approved Risk Management Policy comprised of material risks identified and assessed by the Company. The Company set up a policy framework for ensuring better management of risk profile and provided importance to prudent project (conceptualisation, implementation and sustenance) practices, putting in place suitable risk mitigation measures. The risk management framework of APSEZ sought to minimise the adverse impact of risks on key business objectives and enabled the Company to leverage opportunities. The Company designed and operated its risk assessment model that took quantitative and qualitative data into account.

Key features of the risk assessment dashboard

- Overall location and Company level dashboard
- Category-wise risk dashboards with impact
- Generation of heat maps for each user and function
- Risk trends report and risk severity charts with overall risk severity mapping (H-M-L)
- Location-wise severity
- Bubble charts used to examine impacts and the likelihood of risks on a quarter-to- quarter basis
- Risk severity in risk registers based on a colour coding system
- Access to management users for viewing dashboard for locations and central functions
- Audit trail kept at each level of design
- Auto alerts of risk cards at defined frequency to risk owners and Chief Risk Officer

Risk review

During FY 2023-24, APSEZ proactively worked on preventive measures and mitigation plans for the risks identified to have impacts on the Company. APSEZ has identified risk appetites to facilitate risk review and reporting. This outlines the level of acceptable risk we have defined for the achievement of our goals. It is decided by the risk management team and is approved by the risk management committee with majority independent Board members. The risk management team conducts a quarterly assessment of the actual risk exposure and compares it with the acceptable level for various business goals. The gaps identified, if any, are highlighted accordingly to the management and reported to the risk management committee.



Management of Climate Risks

In FY 2022, APSEZ conducted a climate change scenario planning study, recognizing the financial implications and business risks associated with climate change. The study focused on the infrastructure related to its port operations, aligning with IPCC guidelines and best practices. Using climate change risk assessment framework and consulting sectoral climate experts, APSEZ carried out a climate change vulnerability risk assessment and adaptation planning study in phases, considering different plausible climate change scenarios within the timeframes of 2021-2050 and 2041-2070.

With advancements in climate modelling and incorporating the latest IPCC assessment report (IPCC AR6), APSEZ updated its physical climate risk assessment study, introducing new climate models and scenarios. The revised study expanded the identification of climate-related risks (both physical and transition) and opportunities. The company assesses the magnitude of impact that climate-related risks have on its business using a range of indicators embedded within its risk management tool. APSEZ considers factors such as physical climatic hazards, water sources and consumption, energy mix and consumption, emission profile, and cost and regulatory dimensions of risk. This assessment aids in prioritizing risk mitigation efforts and anticipating future changes in climate risks.

APSEZ effectively monitors climate-related risks through its comprehensive environmental management system at the site level. The Corporate Responsibility Committee (CRC), which convenes quarterly with the Board, reviews climate risks presented by the Head of ESG (Chief Risk Officer) in the Risk Management Committee. Sustainability Leadership Committee also discusses all matters related to climate. The responsibility for site-specific and business-specific responses to climate risks lies with the business entity CEO and the local EHS team. Due to the interdisciplinary nature of climate risks, cross-functional coordination with legal, operations, and supply chain teams is often necessary for effective risk mitigation. APSEZ's approach revolves around transforming risks into opportunities as it develops and expands its business, integrating its decarbonization strategy into its core operations.

At APSEZ, we are committed to leading the way in climate resilience within the ports and logistics industry. Our dedication to sustainable practices and responsible risk management is exemplified through various key initiatives:

Regular Disclosures and Reporting

We ensure transparent and consistent reporting, aligning with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). Our financial reports and relevant documents comprehensively disclose climate-related risks, opportunities, and strategies. By doing so, we empower our stakeholders with crucial information to make informed decisions.

Regular Stakeholder Updates

Communication is at the heart of our climate risk management strategy. We prioritize keeping our stakeholders informed about our progress and improvements in managing climate-related risks. Through regular updates, we strive to build trust and reinforce our commitment to sustainable business practices.

Employee Training and Awareness

We recognize the significance of our employees' role in driving positive change. We ensure that all employees, regardless of their level, receive comprehensive training about climate change, its potential impact on our business, and the importance of climate risk management. Moreover, we foster a culture of climate consciousness, encouraging employees to contribute their ideas for climate risk mitigation and adaptation.

Continuous Monitoring and Review

Our commitment to climate resilience extends beyond initial efforts. We have implemented a robust system for ongoing monitoring of climate-related risks and the effectiveness of our risk management strategies. Regular reviews and updates ensure that we remain agile and responsive to emerging risks and new information.

In summary, APSEZ employs a comprehensive approach to risk management, encompassing risk identification, assessment, and management. By implementing an ERM

framework, engaging key stakeholders, conducting climate change scenario planning studies, and integrating risk mitigation efforts across functions, APSEZ demonstrates its commitment to addressing climate-related risks while embracing opportunities for sustainable growth.

Financial impacts of risks and opportunities identified

Details of opportunities identified with the potential to have a substantive financial or strategic impact on our business.

At our ports, ships currently rely on fossil fuels during berthing. As zero-carbon technologies continue to advance, ships will increasingly depend on ports for green fuel refuelling, onshore renewable power supply, carbon capture and storage (CCS), and waste recycling and disposal. By timely adopting these technologies, APSEZ can benefit from the transitioning shipping sector. Conversely, if we fail to take action to meet the evolving demands, we risk losing customers to our competitors. Developing the necessary infrastructures for these services requires significant investment and a considerable construction period. Therefore, a clear transition pathway and policy certainty are crucial for effective planning and long-term investment. It's worth noting that no clear winner has emerged in the technology space for a clean, feasible, scalable, and cost-effective alternative to traditional bunker fuel, further complicating the planning process.

However, we see a higher opportunity in the deeper decarbonization of the shipping sector. In the realm of onshore power supply alone, there is a potential opportunity for our business. As we continue to electrify our operations with renewable energy, APSEZ can explore the option of charging for providing green onshore power to incoming ships. This investment in low-emission technology has the potential to yield positive returns for the organization.

Explanation of financial impact figure The total installed capacity required to meet the power demand with solar & wind will be 220MW Assumptions for power opportunity: 1. Total power consumption= 385106427 KWh 2. Average cost savings/KWh= ₹ 6/KWh.

Hence, total potential opportunity per year = ₹ 6/KWh* 385106427KWh= ₹ 2,310,638,562

Strategy to realize opportunity and explanation of cost calculation

The power required to meet the power demand with solar and wind will be 385106427KWh. Load Factor = (Total energy output from solar panels) / (Maximum possible energy output from solar panels) We have calculated 'Cost to realize opportunity' by the following assumptions: a. Total installed capacity required to meet APSEZ's power requirement=(38,51,06,427 * (100/20))/ (365*24*1000) = 220 MW b. Cost requires for installation per MW capacity =₹ 60,000,000 c. Cost required for establishment of total requirement = 220*60,000,000 = ₹ 13,200,000,000 Therefore, cost to realize

opportunity= ₹ 13,200,000,000 Based on the above calculation, the pay back period for the stated investment is around 6 years.

Details of risks identified with the potential to have a substantive financial or strategic impact on our business

In our latest climate related risk assessment aligned with RCP 2.6 and RCP 4.5, it is observed that Dhamra, Murmogao, Dahej, Dighi, and Tuna are the five most exposed ports during the baseline period to multiple acute hazards based on the derived multi-hazard index with Dhamra having very high susceptibility to cyclones. The consequences of extreme cyclones will vary depending on the geographic location of each port. Cyclones will affect our operations by causing delays and temporary interruptions in cargo handling. Some specific impacts we anticipate include muddy conditions, operational delays, difficulty in executing operations, congestion, limited access, compromised water quality, habitat damage from increased runoff, dredging requirements, and challenges related to disposal of dredged material. The identified risks have financial implications that include operational delays and stoppages, damage to infrastructure and components, leading to loss of revenues.

Estimated financial implication of the risk before taking action: Minimum impact: Annual revenue from Dighi Port= ₹ 145,500,000 Revenue per day from Dighi Port= ₹ 145,500,000 / 365 days in a year = ₹ 3,98,630 per day.

Maximum impact: Annual revenue from Mundra, Hazira, Dahej, Tuna, Dighi and Mormugao=

₹ 82,410,000,000 Revenue per day from Mundra, Hazira, Dahej, Tuna, Dighi and Mormugao= ₹ 82,410,000,000 /365 days in a year= ₹ 225,780,822 per day Therefore, if a cyclone hits the entire west coast of India then APSEZ would have a revenue loss of ₹ 225,780,822 per day due to disruptions in operations at Mundra, Hazira, Dahej, Tuna, and Mormugao ports.

Estimated costs of these actions: We have developed adaptation plan for the ports based on a comprehensive vulnerability assessment of the operations, assets and infrastructure. In line with the plan, we have invested to build port resilience to withstand or adapt to the extreme climate stressors and recover from any extreme climate events quickly and emerge stronger to cope up better in future. Building resilience involves all the stakeholders that are responsible for planning, financing, operation and maintenance of the port and the allied/ co-located infrastructure. As a result, a holistic approach has been taken that has helped us augment the resilience of the local economy to climate change.

With our adaptation measures we have improved capacity of the port equipment and the allied infrastructure, like roads, rails, drainage systems, etc. to withstand extreme weather events. We have invested ₹ 1,272,000,000 on different adaptation measures till now out of which ₹ 263,000,000 were invested in engineering measures, capacity building, like raising awareness, early warning systems, monitoring, etc. and ecosystem-based adaptation measures like mangrove plantation to reduce impacts of storm surge.

An investment of ₹ 1,007,000,000 was made in operational measures which includes strengthening of standard operating measures, periodic maintenance, pre-post events monitoring check, etc. Additionally, we paid premium of about

₹ 10 crore last year to have insurance against damage to various assets and disruption of operations.

Cost of response to risk = Insurance premium cost+ other climate resilience measures

including the OPEX required to maintain the port from extreme weather conditions (cyclones/storms) = ₹ 100,000,000 + ₹ 1,272,000,000 = ₹ 1,372,000,000

Summary of Transition Risk Assessment Analysis

Transition Risk	Financial Drivers	Impact Level			Strategy to Mitigate/Response to Risk
		Short term	Medium term	Long term	
Current regulations State specific regulation on the purchase of renewable electricity	Decreased revenues due to reduced demand for products and services	Medium	Medium	Medium	APSEZ is targeting to increase the share of renewable electricity from the current 13% to 100% for all its operations by 2025. Our largest port operation at Mundra faces restrictions on renewable power plant installations due to the Gujarat State laws. As per the current regulations of the state, wind-based renewable energy capacities of the Company at a site cannot be more than 50% of the total power requirement contract through the grid. Earlier, these restrictions applied to solar power plants installed capacity as well. While the regulatory change concerning solar power has reduced the regulatory risk, the regulation for wind power continues to hinder our renewables target for the Mundra port. We can achieve a maximum of 62% of energy generation from renewable sources with the current regulations. We anticipate Government of India to levy a carbon tax of 20USD/TCO2e, if the commitments are not met. The estimated financial risk would be ₹ 5.3 crores. We plan to purchase the equivalent emission reduction certificates to fulfil our target, which will cost the organization about ₹ 2.67 crore every year from FY25 onwards.
Emerging Regulations Carbon Pricing Mechanism	Increased direct cost to the company due to imposed carbon tax on emissions	High	Medium	Low	APSEZ has committed to achieving carbon neutrality by 2025 and is in the planning phase to achieve net-zero emissions by 2040 by committing to the Science-based Targets Initiative (SBTi) APSEZ has implemented an internal carbon pricing mechanism, charging \$20 per ton of CO2 emissions for Scope 1 and 2. This initiative generated a fund of USD 9.4 million in FY 2023-24, directed towards investments in renewable projects and energy efficiency measures. Additional initiatives include crane electrification and renewable energy installations, shifting ceramics transport to rail to reduce GHG emissions by 2025.

Transition Risk	Financial Drivers	Impact Level			Strategy to Mitigate/Response to Risk
		Short term	Medium term	Long term	
Technology Transition to lower-emission technology	Increase capital expenditure in terms of investment in new low emission technology	High	Low	Low	<p>APSEZ is adopting lower-emission processes and investing in new equipment and technologies aligned with sustainability standards in response to climate change and evolving regulations.</p> <p>Investment in FY 2024: The Company invested ₹ 1,493 crore on projects related to electrification of equipment, rail infra, energy efficiency, emission reduction, environment protection, water management, waste treatment and adaptation to climate change. This investment includes ₹ 907 crores spent on purchase of electric equipment at the greenfield and expansion projects.</p>
Market Changing customer behaviour	Decreased revenues due to reduced demand for products and services	High	Low	Low	<p>APSEZ proactively responds to market risks by reducing reliance on coal cargo and diversifying into mixed cargo.</p> <p>To navigate changing customer demands and the energy transition, APSEZ is strategically designing ports to handle a diverse range of products, including sustainable energy sources through infrastructure development and collaboration with stakeholders.</p>
Reputation Increased stakeholder concern or negative stakeholder feedback	Decreased access to capital	Medium	High	High	<p>APSEZ is extensively working on enhancing ESG performance by implementing sustainable practices, reducing carbon footprint, promoting social responsibility, and ensuring good corporate governance.</p> <p>APSEZ publishes comprehensive and credible integrated annual reports and TCFD report highlighting the company's sustainability initiatives, performance, and future targets.</p> <p>APSEZ's business strategy successfully integrates ESG considerations and climate-related issues into the company's overall business strategy. This includes Incorporating sustainability and emission reduction goals into key performance indicators (KPIs) and executive compensation to emphasize the company's commitment to responsible practices.</p> <p>APSEZ conducted scenario analyses to assess the potential financial impacts of transition risk on the company's access to capital and revenues. This can help in identifying and addressing vulnerabilities proactively.</p>

Metrics & Targets

Climate considerations significantly influence our strategic decision-making, investments, and overall business approach.



This section delineates our dedication to aligning with the TCFD recommendations by presenting a clear climate metrics and targets. By disclosing these key indicators, APSEZ aims to provide stakeholders with a detailed understanding of our approach to climate risk assessment, emission reduction, renewable energy integration, and other vital aspects.

GHG Emissions

We have a target to become carbon neutral by 2025 which will cover our entire Scope 1 and Scope 2 emissions from the port operations. We also have a target to achieve net zero by 2040 which is a science-based target.

We have committed to seek validation of this target by the Science Based Targets initiative in the next two years which will also cover the Scope 3 emission reduction.

Our Scope1, Scope 2 and Scope3 GHG accounting is aligned with the GHG protocol and follows the best international practices and provides us with a mechanism to track our carbon footprint and progress towards our goals. We keep aligning our mission reduction actions to our short- and medium-term goals. Our total emission (Scope 1 and 2) in FY 2024 was 469.6 ktCO₂e.



Key Climate Metrics

GHG Emissions

CO ₂ e Emissions (Metric tonnes)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Total direct GHG emissions (Scope 1)	95,830	89,509	84,457	1,04,172	92,905	1,10,394	1,29,438	1,21,102	1,26,197
Total direct GHG emissions (Scope 2) - Location Based	1,59,027	1,66,405	1,61,541	1,74,605	1,89,555	1,96,160	1,93,062	2,61,951	3,43,428
Scope 1 + 2	2,54,858	2,55,914	2,45,998	2,78,777	2,82,460	3,06,553	3,22,499	3,83,053	4,69,625
Total Indirect GHG emissions (Scope 3)	-	-	-	-	2,06,843	3,48,341	4,71,649	20,23,072	18,87,215

In view of our emissions targets, we have scaled up the ambition for renewable capacity to an additional 1,000MW from the earlier planned 100MW capacity. Ports have the largest emission footprint at APSEZ contributing about 83% of emission, followed by dredging and harbor services which contribute 8% and 6% of the total emission respectively.

Energy Consumption


CO2e Emissions (Metric tonnes)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Total energy consumption	1,963	1,851	1,879	2,175	2,101	2,429	2,799	3,013	3,453
Fuel energy consumption	1,265	1,118	1,127	1,355	1,202	1,439	1,712	1,626	1,660
Total electric energy consumption	698	732	753	820	899	990	1,086	1,388	1,793
Nonrenewable electric energy	698	731	709	767	832	861	861	1,194	1,565
Renewable electric energy consumption	-	2	43	54	66	129	215	194	228
Total energy consumption Intensity - GJ/₹Cr	250.3	195.2	152.4	177.0	153.0	167.3	154.7	134.5	122.0

The share of electricity in our total energy consumption increased to 49% from 46% last year which is in line with our strategy to switch from fossil fuel to electricity use. As we source more renewable electricity in future, we will be able to reduce the scope 2 emissions from our operation. However, the proportion of renewables in total electricity consumption stood at 13% in FY 2024 which would increase once the captive renewable capacity is ready.


Targets

Our targets encapsulate a multi-faceted approach, spanning emissions reduction, renewable energy adoption, and resilience measures. We aim to reduce our greenhouse gas emissions, both from direct and indirect sources, by a specified percentage over a defined timeline. Concurrently, we strive to enhance our renewable energy capacity to about 100% in total electricity energy, ensuring a notable share of our energy consumption is sourced sustainably. We are dedicated to implementing targeted measures to enhance climate resilience across our operations and supply chain. The below targets represent our strategic roadmap, steering us towards a low-carbon, sustainable future while bolstering our resilience to climate risks.


Towards our Net Zero Strategy




50%
Energy Intensity reduction by FY 2025 (baseline: FY 2016)




60%
Emission Intensity reduction by FY 2025 (baseline: FY 2016)



100%
Renewable share in the total electricity by FY 2025



Zero waste
to landfill certification for all the operation sites by FY 2025



Become a **Carbon neutral** by FY 2025

Scope 3 Emissions

CO2e Emissions (Metric tonnes)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Category 1 - Purchased goods & services	-	-	-	4,75,391	3,27,542
Category 2 - Capital goods	-	-	-	8,48,219	9,81,553
Category 3 - Fuel- and energy-related activities	414	51,465	49,103	1,32,022	64,025
Category 4 - Upstream transportation and distribution	1,76,535	2,06,645	2,88,191	4,22,719	341,195
Category 5 - Waste generated in operations	96	58	58	329	329
Category 6 - Business travel	1,356	227	531	169	498
Category 7 - Employee commuting	2,709	2,626	1,801	1,367	1,321
Category 8 - Upstream leased assets	-	-	-	-	-
Category 9 - Downstream transportation and distribution	-	47,213	69,097	97,653	112,876
Category 10 - Processing of sold products	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Category 11 - Use of sold products	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Category 12 - End-of-life treatment of sold products	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Category 13 - Downstream leased assets	-	8,047	10,625	11,589	11,513
Category 14 - Franchises	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Category 15 - Investments	25,734	32,061	52,242	33,614	46,362
Total	2,06,843	3,48,341	4,71,649	20,23,072	18,87,215

Scope 3 includes emissions arising from fuel consumed by contract vehicles, contract equipment, administrative vehicles (outsourced), business travel (air, train, bus, and four- wheeler), employee transit (daily commute), waste disposal (outsourced), horticulture equipment and vehicles (outsourced), canteens and its vehicles (outsourced), and other indirect emissions. Emissions from investments include our joint ventures' Scope 1 & 2 emissions. Total Scope 3 GHG emissions for FY2022-23 were 2,023 ktCO2e.

Annexure

Environmental Data

APSEZ	Unit of Measurement	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2024 Target
CO2e Emissions							
Total direct GHG emissions (Scope 1)	Metric tonnes	92,905	1,10,394	1,29,438	1,21,102	1,26,197	1,28,960
Total direct GHG emissions (Scope 2)	Metric tonnes	1,89,555	1,96,160	1,93,062	2,61,951	3,43,428	3,36,559
Total Indirect GHG emissions (Scope 3)	Metric tonnes	2,06,843	3,48,341	4,71,649	20,23,072	18,28,018	20,50,000
Category 1 – Purchased goods & services	Metric tonnes	-	-	-	4,75,391	3,27,542	
Category 2 – Capital goods	Metric tonnes	-	-	-	8,48,219	9,81,553	
Category 3 – Fuel- and energy-related activities	Metric tonnes	414	51,465	49,103	1,32,022	64,025	
Category 4 – Upstream transportation and distribution	Metric tonnes	1,76,535	2,06,645	2,88,191	4,22,719	3,41,195	
Category 5 – Waste generated in operations	Metric tonnes	96	58	58	329	329	
Category 6 – Business travel	Metric tonnes	1,356	227	531	169	498	
Category 7 – Employee commuting	Metric tonnes	2,709	2,626	1,801	1,367	1,321	
Category 8 – Upstream leased assets	Metric tonnes	-	-	-	-	-	
Category 9 – Downstream transportation and distribution	Metric tonnes	-	47,213	69,097	97,653	1,12,876	
Category 10 – Processing of sold products	Metric tonnes	-	-	-	-	-	

APSEZ	UOM	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2024 Target
CO2e Emissions							
Category 11 – Use of sold products	Metric tonnes	-	-	-	-	-	
Category 12 – End-of-life treatment of sold products	Metric tonnes	-	-	-	-	-	
Category 13 – Downstream leased assets	Metric tonnes	-	8,047	10,625	11,589	11,513	
Category 14 – Franchises	Metric tonnes	-	-	-	-	-	
Category 15 – Investments	Metric tonnes	25,734	32,061	52,242	33,614	46,362	
Scope 1 + 2	Metric tonnes	2,82,460	3,06,553	3,22,499	3,83,053	4,69,625	
Scope 1 + 2 + 3	Metric tonnes	4,89,304	6,54,894	7,94,148	24,06,125	22,97,643	
CO2e emissions intensity (scope 1 + scope 2)/Revenue)	tCO2e/Cr	20.57	21.11	17.83	17.10	16.65	
Water							
Total net fresh water consumption	Million m3	1.6113	1.8488	2.7432	3.6234	4.3011	4.2581
Withdrawal: Total municipal water supplies (or from other water utilities) (a)	Million m3	0.7467	1.1885	2.1743	2.5374	2.6858	
Withdrawal: Fresh surface water (lakes, rivers, etc.) (b)	Million m3	0.6288	0.3962	0.3475	0.7519	1.2346	
Withdrawal: Fresh groundwater (c)	Million m3	0.2358	0.2641	0.2214	0.3286	0.3752	
Water returned to the source of extraction (d)	Million m3	-	-	-	0.0055	0.0055	

APSEZ	Unit of Measurement	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2024 Target
Water							
Water discharge excluding salt water	Million m ³	-	-	-	-	-	
Water discharge excluding salt water	Million m ³	-	-	-	-	-	
Water withdrawal excluding saltwater (a + b + c - d)	Million m ³	1.6113	1.8488	2.7432	3.6234	4.3011	
Total waste water recycled	Million m ³	0.53	0.65	0.74	-	1.16	
Total water consumption	Million m ³	4.12	4.12	4.73	-	7.04	
Total water consumption intensity	ML/Cr	0.30	0.28	0.26	-	0.25	
Waste							
Total Waste recycled/reused	Metric tonnes	4,811	9,785	10,468	11,108	10,390	
Waste landfilled	Metric tonnes	143	140	1,694	944	893	
Waste incinerated with energy recovery	Metric tonnes	753	532	710	1,132	953	
Waste incinerated without energy recovery	Metric tonnes	152	263	123	140	345	
Waste with unknown disposal method	Metric tonnes	-	-	-	-	-	
Waste otherwise disposed	Metric tonnes	-	-	-	-	-	
Total waste disposed	Metric tonnes	1,048	935	2,527	2,216	2,191	2,327
Waste Intensity	Mt/Cr	0.42	0.47	0.44	0.36	0.27	

APSEZ	Unit of Measurement	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2024 Target
Energy							
Total energy consumption	TJ	2,101	2,429	2,799	3,013	3,453	
Total Non renewable energy consumption	TJ	2,034	2,300	2,583	2,819	3,225	3,297
Fuel energy consumption	TJ	1,202	1,439	1,712	1,626	1,660	
Total electric energy consumption	TJ	899	990	1,086	1,388	1,793	
Non renewable electric energy consumption	TJ	832	861	871	1,194	1,565	
Renewable electric energy consumption	TJ	66	129	215	194	228	
Total energy consumption Intensity	GJ/₹Cr	153.0	167.3	154.7	134.5	122.4	
Spend on environment and climate change							
Spend on environment and climate change - CAPEX	₹ Lakhs	5,500	4,022	20,969	76,740	1,49,300	
Environmental Investments - Operating expenses	₹ Lakhs	3,600	3,594	2,355	2,559	3,170	
Environment - Savings, cost avoidance, income, tax incentives, etc.	₹ Lakhs	991	353	770	3,603	9,527	
Number of Environmental violations of legal obligations/regulations	₹ Lakhs	0	0	0	0	0	
Amount of fines/penalties related to Environmental violations	₹ Lakhs	0	0	0	0	0	

Adani Ports and Special Economic Zone Limited

Registered office

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