



Climate and Environment



Context

In recent years, it has become evident that climate change is not a far-off issue but an urgent crisis with profound implications for the global economy and corporate sustainability. Extreme weather can affect society through disruption to business continuity, infrastructure, and supply chains, as reported by the Intergovernmental Panel on Climate Change (IPCC). Meanwhile, the Asian Development Bank (ADB) warned that climate loss at reference levels could shrink Asia-Pacific's GDP by nearly 11% by the end of the century.

India, the second-most populous country in the world and one of its largest growing economies is at high risk of climate change impacts. Changes in weather patterns have already wreaked havoc on the country. India has experienced a 10% increase in extreme weather events—such as more intense heatwaves and unpredictable monsoon patterns—which have had severe implications for agriculture, water resources, and public health over the past few decades, according to the Indian Ministry of Earth Sciences. The World Bank, for example, has warned of a 2.8% decline in India's GDP opportunity loss by 2050 if present climate trends continue, which could exacerbate poverty and inequality.

Understanding the global implications of these changes, climate change is identified as the most significant risk to world stability in a decade by the World Economic Forum, which bears consequences for resource accessibility, financial markets, and geopolitical dynamics. The COP28 summit has left no doubt over the renewed and reinvigorated call to action for corporates, communicating that they are both

a large part of the problem and also at least as important as any other group in solving climate change. Businesses that do not adapt to the low-carbon transition will be putting themselves at higher regulatory, reputational, and financial risk.

India is the third-largest greenhouse gas emitter in the world, with a large share of emissions from its energy sector and primarily coal-fired power plants. Yet, the Indian government has undertaken significant efforts in this regard. As part of the Paris Agreement, India plans to lower the emissions intensity of its GDP by 33-35% compared with 2005 levels. It aims for renewable energy sources to provide up to 50% of generation capacity by 2030.

It also intends to achieve net zero emissions by 2070—a reminder of the work that lies ahead. Indian companies play an essential role in fulfilling these goals. The Confederation of Indian Industry (CII) has constantly pushed the industry to follow global best practices in areas such as energy efficiency, waste management, and carbon reduction strategies.

In short, the need for corporate action on climate change has never been more apparent. Data from global organizations like the IPCC, World Economic Forum, and ADB, alongside India-specific data, validate the need for action now. The future belongs to businesses that invest in climate action today, especially those operating within the Indian economy. This is our last chance to act, and the cost of doing nothing is too great.





Approach¹

The pharmaceutical industry significantly contributes to global carbon emissions, accounting for approximately 4.4% of the worldwide carbon footprint. When evaluated per dollar, the sector's carbon intensity is higher than that of many other industries, including automobiles. This is primarily due to the energy-intensive nature of pharmaceutical manufacturing, complex global supply chains, and strict regulatory requirements. The reliance on coal-powered energy, particularly in manufacturing hubs like India, where many generic drugs are produced, further exacerbates the carbon footprint. Additionally, the extensive global supply chain contributes to the sector's environmental impact, with reports suggesting that optimising these networks could reduce the carbon footprint of certain drugs by up to 10%.

Transitioning to low-carbon emission manufacturing has been a persistent challenge for the sector. Developing sustainable technologies and processes that maintain drug efficacy and safety is complex and resource-intensive, requiring significant innovation and investment.

As climate change intensifies, health issues such as infectious diseases and respiratory conditions are expected to worsen. The pharmaceutical industry must tackle these challenges by reducing its carbon footprint. It also needs to innovate and develop treatments for emerging threats. This requires a fundamental rethinking in business strategies, operations and overall drug development approaches.

Granules India's purpose, 'Healing lives responsibly through pioneering green science', aligns with global efforts to combat climate change. This purpose statement reflects our commitment to enhancing health and well-being while conducting business sustainably and ethically and protecting the interests of all stakeholders and the planet. We foster a culture of innovation, consistently investing in research and development to achieve more affordable and efficient outcomes. Our emphasis on green science ensures that our methods and processes reduce environmental impact and address climate risks. Therefore, our Company's purpose and business conduct are intrinsically geared toward addressing climate change. This drives our approach to climate change. (To understand more about Granules and its business strategies, please visit the Annual Report 2023-24).

Actions & Initiatives

Our actions and initiatives on climate change in the past years have been focused on knowing our contribution to climate change (elaborated under GHG emissions), setting ambitious targets aligned with the global best practices and making commitments, developing strategies for a climate action transition plan, cascading the action expectations within and beyond the operational boundaries and getting the armor together to deliver on the low carbon transition pathway.

As these long-term defined actions were under development, we continued improving our energy performance and greening the power we use and the infrastructure we build.



¹ World Economic Forum. (2022, November). How the pharmaceutical industry can reduce its climate impact. Retrieved from [World Economic Forum] (<https://www.weforum.org/agenda/2022/11/pharmaceutical-industry-reduce-climate-impact/>)

- Cornell Chronicle, "Drug industry's carbon impact could be cut by half," May 8, 2023.
- Pharmaphorum, "Public wants pharma to reveal carbon footprint of drugs," 2023.

- ISPOR, "The Pharmaceutical Industry's Carbon Footprint and Current Mitigation Strategies," 2023.



Granules India has received SBTi validation and approval for both near-term and long-term goals, aligned with the 1.5°C pathway toward net zero by 2050 or sooner.

Granules India Limited has reached a significant milestone in its sustainability journey with the validation and approval of its near-term, long-term, and net zero greenhouse gas (GHG) emission reduction targets by the Science Based Targets initiative (SBTi). This achievement places Granules among a select group of Indian pharmaceutical companies with SBTi-validated targets under the initiative's latest guidelines. Aligning with the 1.5°C pathway, these ambitious goals demonstrate Granules' commitment to addressing climate change responsibly and establishing leadership in sustainability within the pharmaceutical industry.



Dr. Krishna Prasad Chigurupati
Chairman & Managing Director

Sustainability lies at the core of our decision-making and business strategy, as articulated in our purpose statement: **Healing lives responsibly through pioneering green science.** I am proud that Granules has received SBTi validation and approval for our near-term and long-term goals, aligned with the 1.5°C pathway toward net zero by 2050 or sooner. This milestone strengthens our commitment to accelerate decarbonization, integrate these targets across our operations and supply chain, and drive progress through collaboration and innovation.

This validation aligns Granules' sustainability strategy with its purpose, Healing lives responsibly through pioneering green science, and reflects collaborative leadership in embedding decarbonization into business processes and the supply chain. While this milestone is a proud achievement, it also highlights the need for decisive action to achieve these goals. Granules is focused on near-term initiatives, including efficiency measures in power and fuel usage, transitioning boiler operations to alternate fuels, accelerating renewable energy adoption, and engaging supply chain partners through its Supplier Sustainability Program.

About SBTi

The Science Based Targets initiative (SBTi), a collaboration among the Carbon Disclosure Project (CDP), United Nations Global Compact (UNGC), World Resources Institute (WRI), and World Wide Fund for Nature (WWF), provides guidance for companies to reduce greenhouse gas emissions. By defining how much and how quickly emissions must decrease to limit global warming to 1.5°C above pre-industrial levels, the SBTi offers a clear pathway to future-proof growth. The commitment is supported by well-crafted short-term and mid-long-term targets and objectives with a decided action plan to achieve the commitments.

Key highlights of these targets include



Near-Term Goals

Reduce absolute Scope 1 and 2 emissions by 42% and Scope 3 emissions by 42% by FY 30 (FY 23 baseline), while transitioning to 100% renewable electricity by the same year.



Long-Term Goals

Achieve a 90% reduction in absolute Scope 1, 2, and 3 emissions by FY 50.



Net Zero Commitment

Achieve net zero GHG emissions across our value chain, including all subsidiaries, by FY 50.





Climate Action Transition Plan

Granules has a comprehensive Climate Action Transition Plan to reach net zero carbon emissions by 2050. This strategic roadmap, developed in collaboration with Siemens, addresses emission sources across all three GHG emission scopes.

Tackling Carbon Emissions in Operations

A balanced approach of supply-side and demand-side initiatives has been identified to reduce Scope 1 and Scope 2 GHG emissions and support decarbonization till 2030. It identifies that beyond 2030, high green energy support will be needed to meet the decarbonization goals. This strategy is based on a detailed study at the Bonthapally and Gagillapur facilities, where the primary sources of emissions are coal-fired boilers and grid electricity. Granules will utilize a similar approach for other operational locations.

Scope 1 Strategy: Direct Emissions Reduction

Granules' strategy for reducing Scope 1 emissions focuses on direct emissions from sources owned or controlled by the Company. The critical areas of focus include enhancing energy efficiency in our on-site operations, fuel switching, and exploring innovative carbon offset mechanisms.

One of the major initiatives is the transition from coal to biomass for our on-site boilers. This shift is expected to significantly reduce our carbon footprint while maintaining the efficiency of our heating and cooling processes. Additionally, Granules is investing in electrification, where feasible, to replace fossil fuel-dependent systems with those powered by renewable energy sources.

The Climate Action Transition Plan is a holistic approach that addresses emissions across all scopes. Through strategic initiatives in Scope 1, 2, and 3, Granules is not only working to meet its 2050 net-zero target but is also setting a benchmark for sustainability in the pharmaceutical industry.



Scope 2 Strategy: Indirect Emissions Reduction from Purchased Energy

Reducing Scope 2 emissions, which stem from the electricity and energy we purchase, is a critical component of our climate action plan. Granules is committed to sourcing renewable energy, both through on-site installations and Power Purchase Agreements (PPAs). Our strategy includes acquiring Renewable Energy Certificates (RECs) to validate our further use of green energy.

Scope 3 Strategy: Value Chain Emissions Reduction

Scope 3 emissions, which encompass all other indirect emissions across our value

chain, represent the most significant and most complex part of Granules' carbon footprint. Our strategy to reduce Scope 3 emissions involves close collaboration with suppliers, the adoption of green chemistry principles, and ongoing policy advocacy.

Granules actively engages with suppliers to ensure they align with our sustainability goals. We prioritize partnerships with those who commit to reducing their carbon emissions. Additionally, our CZRO initiative is pivotal in reimagining chemistry, focusing on developing green molecules and applying bio-catalysis and continuous manufacturing technologies.

Policy advocacy and industry engagement are also vital aspects of our Scope 3 strategy. By participating in global forums such as COP28, Granules is helping to shape the future of sustainable pharmaceutical manufacturing, ensuring that the entire industry moves toward decarbonization.





Tackling Carbon Emissions in the Value Chain

Supplier Engagement Program

Granules India Limited is committed to advancing its sustainability goals through a robust Suppliers' Sustainability Program. We prioritize the selection of suppliers who align with our sustainability objectives and work closely with them to reduce their carbon footprints. A significant portion of our Scope 3 emissions originates from the chemical inputs used in our production processes. To address this, we have leveraged the CZRO platform to actively work on reducing these emissions. This collaborative approach with our suppliers is essential in driving decarbonization efforts across our supply chain, ensuring that our sustainability initiatives extend beyond our immediate operations.



Green Molecules

At Granules, our decarbonization efforts are built on three foundational pillars. The first pillar focuses on green molecules. To translate Granules' focus on green molecules into reality, we have constituted a separate subsidiary called the Granules CZRO to focus on green power, responsible water use, and clean air. Through this, we are developing a new greenfield plant spread across 100 acres, envisaged to be completed in the next five years. It aims to leverage an Integrated Green Energy & Green Chemicals Platform enabled by a third party. The facility will be powered by 24x7 carbon-free green energy, with only a very few input materials required from outside the two facilities being set up by Granules and its partners. Granules will utilize Carbon Free Energy and Green molecules to produce APIs, along with their KSMs and intermediates. Granules will be producing not only the KSMs for these products here but also most of the chemicals to make the KSMs at this site, which will lead to almost zero carbon footprint from the final API. In a nutshell, Granules CZRO seeks to achieve near net zero carbon footprint from 'Cradle to Gate' across Scope 1, 2, and 3.

Reimagining Chemistry

The second pillar is our commitment to efficient methods of synthesis. We are also embracing principles of green science and green chemistry, such as bio-catalysis, continuous manufacturing (flow technology), and formulation technology & processes.

Our enzyme and bio-transformation technique is an eco-friendly substitute to metallo-catalysis because of its mild reaction conditions, mild reaction conditions, few side reactions,

non-toxicity, degradability, and safety. This is also being institutionalised in the form of an Eco scale, which uses six parameters and 38 sub-parameters. The parameters include yield, safety, effluent, input/RM cost, operations parameters, and infrastructure considerations.



Breakthrough in Formulation Manufacturing

The third pillar is our groundbreaking work in formulation manufacturing. The process of converting APIs into tablets, injectables, or liquids presents substantial environmental challenges. We are addressing these by developing solvent-free pharmaceutical processes, creating polymer-free formulations, and minimizing water usage in our manufacturing processes. Our collaborations with premier academic institutions such as NIPER drive these advancements. Together, we are developing plant-based excipients, directly compressible crystals, and resource-efficient pharmaceutical products.

These pillars form the core of our environmental strategy, ensuring that we address sustainability comprehensively across all critical junctures of our value chain. Our efforts in green molecules, efficient synthesis methods, and innovative formulation manufacturing are redefining pharmaceutical manufacturing, demonstrating our commitment to producing medicines with a near-net-zero carbon footprint.

Outlook

Our climate commitment is more than a response to external pressures—it reflects our core values and our commitment to regularly challenging the business to achieve a sustainable future. As we move forward, we will continue to refine our approach, ensuring that every step we take brings us closer to achieving our net-zero goals and making a lasting positive impact on the environment.

While significant actions for net zero are underway, we are focused on a cultural shift towards climate change within Granules. We are implementing policy changes and creating awareness towards green practices to bring about this change. Some initiatives getting rolled out in the coming year towards this shift are promoting virtual meetings to reduce unnecessary commutes, encouraging employees to use company buses for pooled travel and have already installed EV charging stations at our facilities to promote electric vehicle usage.





Green Building at Genome Valley



The new formulation facility at Genome Valley integrates sustainable design with green building principles. It will add 10 billion dosages to our capacity and features energy-efficient systems, water conservation, and renewable energy, reinforcing our commitment to sustainability and innovation.

This facility touches all aspects of a green building, from design to implementation. To minimize environmental impact, soil erosion control starts with topsoil preservation, sedimentation pits, and rainwater harvesting. Moves to efficient waste management with the aim to divert at least 50% of construction waste from landfills by implementing strict waste segregation and monitoring processes, ensuring materials are reused or recycled wherever possible. The facility will feature a rainwater

harvesting system designed to capture 50% of runoff from the roof and non-roof surfaces, with storage capacity sufficient for two to three days of rainfall. This will significantly reduce reliance on external water sources.

Direct GHG emission reduction benefits will be achieved by good energy planning and management. We aim to achieve 20% energy savings over the ASHRAE90.1/ECBC standards, using 2004 as our baseline. This will be achieved through the installation of high-efficiency, CFC-free centrifugal chillers equipped with variable frequency drives, which optimize part-load efficiency and further reduce energy consumption and GHG emissions.



1 MW of solar rooftop photovoltaics and Building Integrated Photovoltaics (BIPV) will be installed. Additionally, 75% of surface parking will be covered with solar panels, mitigating the micro-climate impact of heat dissipation.

Efficient use of materials will be prioritized along with the use of salvaged and recycled materials, including steel, cement, glass, and tiles, to minimize the environmental impact of virgin material extraction and processing. All wood used in the project is certified by the Forest Stewardship Council or the local Forest Department, with at least 50% of renewable

wood-based products meeting this standard—the incorporation of building design features that promote health and safety. We have eliminated asbestos, a known carcinogen, and are targeting a daylight factor of 2% in at least 50% of occupied spaces to reduce energy consumption and enhance the indoor environment.

The Genome Valley facility is more than a construction project; it represents a holistic approach to sustainable development. We aim to achieve IGBC Green Certification for our GLS project and reaffirmed our commitment to this goal on Earth Day 2023 through the "Crusaders of sustainability" award for Green Building project.

