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Sustainability in the Pharmaceutical Industry

Opportunities for Indian pharmaceutical companies leveraging global impetus around environmental footprint

Preface: The Indian pharmaceutical industry plays a pivotal role in global healthcare landscape and is expected to reach the size of $65 bn. by 2024, but it also carries a substantial environmental footprint. This whitepaper explores the critical issue of sustainability within the Indian pharmaceutical industry, addressing its impact on the environment. We examine key sustainability challenges, strategies for reducing environmental footprints, and highlight the key opportunities for sustainable pharmaceutical industry in India.

1.0: The Context of Sustainability

The World Health Organization has recognized climate change to be the biggest threat facing humanity[1]. The Paris Agreement, adopted by 196 countries in 2015, intends to limit global temperature increase to 2 degrees Celsius (ideally to 1.5 degrees Celsius) above pre-industrial levels[2]. To begin to address the issue of climate change, pharmaceutical companies should first understand their own contributions.

> **"Sustainability journey shall not be designed by convenience; but well-thought milestone-**based approach to move towards defined **sustainability targets. It requires meticulous planning, rock-solid commitment, and** flawless **execution."**
>
> –Sudhakar Mishra, Director Healthcare & Lifesciences at Frost & Sullivan

The pharmaceutical industry plays a pivotal role in the care pathways by providing critical medicines impacting billions of lives positively. The industry needs to work diligently to minimize environmental footprints. There are huge opportunity areas when sustainability within pharma in looked upon. This ranges from efforts to reduce carbon emissions, waste management, optimized water usage and sustainability in research. According to Frost & Sullivan (F&S) research, several pharma companies have already committed towards sustainability goals, but for those that have not – or those who want to do better – many solutions are available to also start their sustainability journey.

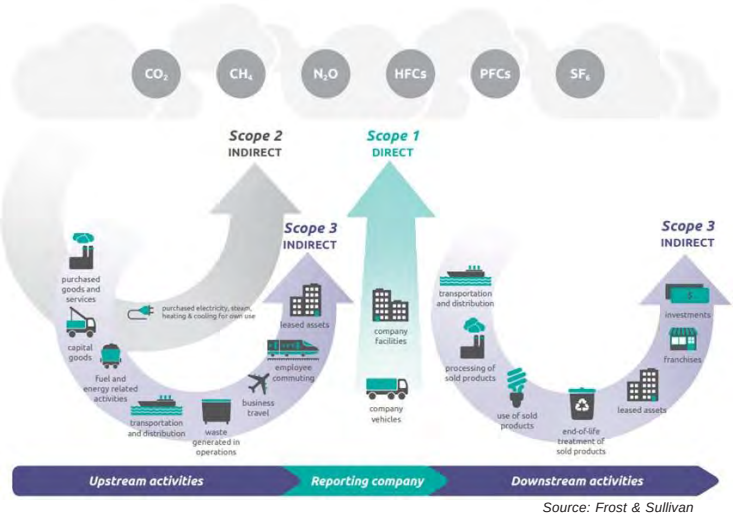
2.0 : Carbon Emissions within the Pharmaceutical Industry:

One critical dimension of sustainability is controlling carbon emissions within the pharma industry; hence making a positive impact on the environment.

Thinking about the recent past, emissions reduction was a big topic in the industrial sectors, such as, energy, mining, and automotive. The carbon footprint of the pharmaceutical sector received inadequate mindshare. However, the increase of global disease burden is pushing need for medicines northwards. Further analysis of the pharma industry highlights that the carbon emissions problem is substantial and requires significant measures from all eco-system players.

Pharma companies contribute to emissions through their supply chain manufacturing and on-site emissions[3]. By some estimates, the magnitude of emissions from pharma companies is similar in magnitude or even greater than that of the automotive industry[4].

Inherent to the nature of the business, pharma companies utilize many resources, several of which contribute to Green House Gas (GHG) emissions[5]. According to F&S research, these are produced from a variety of activities, from employee commuting and business travel to powering company facilities, waste generation, and manufacturing of life-saving medicines. Aside from directly produced emissions, the pharma value chain often involves purchasing and distribution of goods through other companies. Supply chains are often geographicallybroad (for example, 60-80% of active pharmaceutical ingredients [API] used by EU-based companies are manufactured outside of the EU, largely in India and China[6]), meaning transportation over long distances resulting in high emissions. When considering the different scopes of emissions (illustrated in Figure 2.1) involved in getting a drug to a patient, there are several potential targets for decarbonization.



Source: Frost & Sullivan

Fig. 2.1: Examples of Scope 1, 2, and 3 emissions[7]

Opportunities exist to set goals and decarbonize. We see that 91% of 75 publicly traded companies in this sector did not have climate commitments aligned with a 1.5 degrees Celsius pathway as of 2022, and it is estimated that only 4% of pharma companies were on track to meet Paris 2030 climate targets as of November 2021[8]. The good news is that some pharma companies have set goals to improve; as much as 46% of the pharma sector by revenue has been committed[9] to the United Nations' Race to Zero Campaign, a global campaign which mobilizes a coalition of leading net-zero initiatives across sectors to achieve net-zero carbon emissions by 2050[10].

Reduction of emissions through decarbonizing can be supported by an energy transition of replacing fossil fuel-based energy supply, increasing share of renewable energy, and reducing Scope 3 emissions. Choosing a global energy company as a strategic partner can support pharma companies to accelerate their journey.

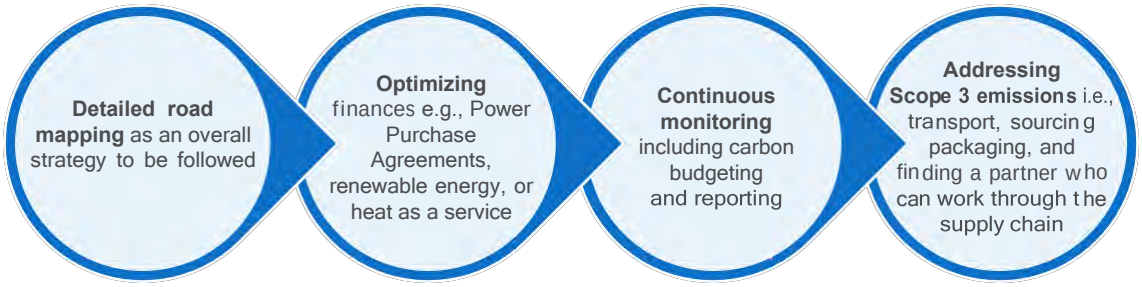
Global Best-Case examples:

Catalent, leading global CDMO for Pharma & Biotech showcased their strategies toward decarbonizing, largely improvements to Scope 2, achieving 97% renewable energy sourcing across global operations[11].

Another example of a pharma company making improvements to their broader value chain is Biogen, who became the first Fortune 500 company committing to become free from fossil fuels by 2040[12]. In the eyes of F&S, the pharma industry will need to see more bold targets and concrete plans to ensure the sector is on track to meet the Paris climate goals.

Moreover, Indian pharma industry can also learn from the valiant actions being taken in global companies and traditional industries like automotive, mining etc. While several global pharma companies are already making notable progress, others are still in the early stages of identifying actions to take. The global pharma industry has a notable lack of low-carbon products or services compared to other industries.

According to F&S, there can be broad hurdles related to decarbonizing in terms of perceived cost, falling short of expectations, and even awareness of and implementing available solutions. Specific challenges where Indian pharma companies can improve decarbonizing efforts include:

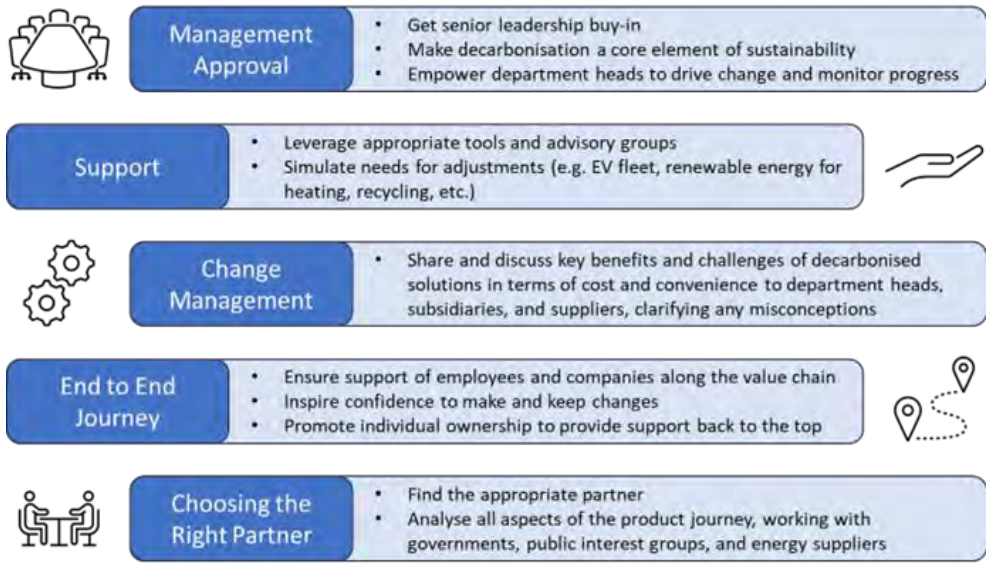


2.1 Critical Enablers for Accelerating Decarbonization

The Indian pharma industry need to be thoughtful about environmental sustainability and take big steps towards reducing carbon emissions. The critical enablers in this sustainability journey would be effective stakeholder management and partnerships.

2.1.1 Stakeholder Management:

It is Frost & Sullivan's opinion that by utilizing an ideology of shared ownership, Indian pharma companies have an opportunity to impact emissions by consistent scrutiny, providing the needed resources, and collaborating on net-zero initiatives. The ideal way to do this is collaborating with a global energy company, whose knowledge in the area and goals are aligned with yours. Key considerations in the areas of management approval, support, change management, end to end journey, and choosing the right partner can ensure a successful decarbonization journey.



2.1.2 Effective Partnerships:

Aside from collaboration within an organization and across the value chain, there are opportunities to work with other pharma companies in joint ventures or devotion to common goals, coming together with public interest groups, and soliciting the help of local or regional governments (Fig 2.2). Countries with decarbonization expertise are partnering to exchange advanced decarbonization technologies & strategies and low carbon enabling systems, services, and infrastructure to help other countries attain sustainability goals. In exchange, the countries can claim credit and certificates for their contribution to the low carbon economy[13]. Indian Pharma industry should work diligently to create these kinds of partnerships.

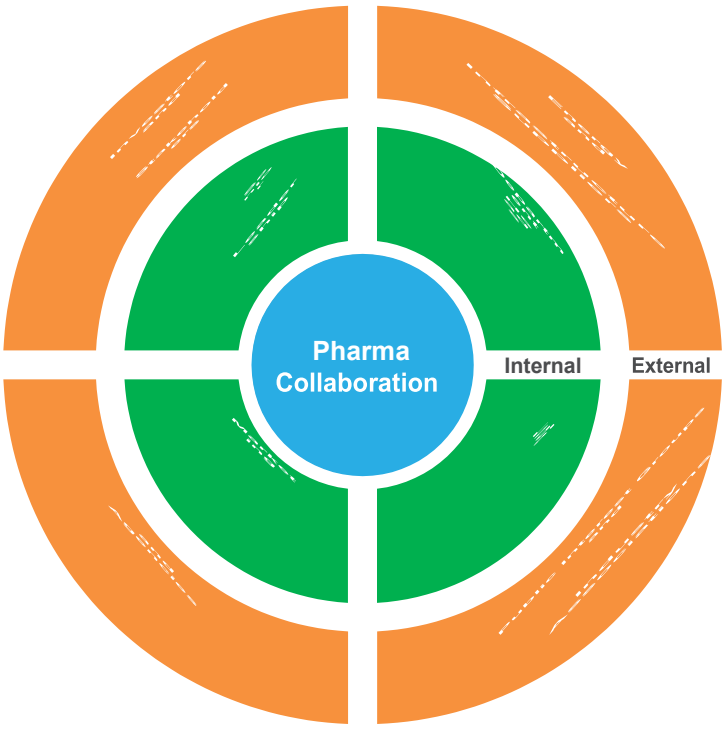


Figure 2.2: Collaboration among internal and external sources can help to ensure carbon emission reduction efforts are reinforced

Several examples of multiple global pharma companies pledging improvement together have been seen in recent years:

- Independent energy organizations which provide education and access to Purchase Power Agreements (PPAs)
- Four companies in Japan collaborating on sustainable packaging[14]
- United Nations Health Systems Task Force[15]
- The Activate Program[16]

These types of programs can also permit pharma companies to work with Active Pharmaceutical Ingredient supply chains and distribution to reduce environmental impact – especially in Scope 3.

The path forward to decarbonization involves multi-stakeholder cooperation and engagement, with a clear roadmap set in place. When pharma companies hold themselves accountable for what they directly and indirectly emit (Scope 1 and 2), and for the other companies involved in getting a product to market (Scope 3) – true change can occur, positive image is promoted, and the global ecosystem and population benefit together.

3.0 Managing Pharma Waste Sustainably

Zero waste strategies are super critical in Indian Pharma companies due to huge amount of waste produced by them throughout the value chain.

Sustainability initiatives will rise through investment in co-processing, recycling, or composting waste. CROs, CDMOs, and Pharma companies are developing value-from-waste recycling programs that convert waste into saleable products with applications in other industries (construction, chemical, additive). For example, LabCorp's UK Go Green team implemented a polystyrene recycling program to recycle polystyrene waste into compressed 4-kg briquettes to be used in the construction industry.

Adoption of eco-designed product packaging for reuse, optimized material use, and single-use to closed-loop techniques for the circular economy are expected to gain traction.

Partnership with waste management specialists can improve precise segregation of waste and identify high value recyclable materials from which rebates can be generated e.g., Axil Integrated services increased rebates for Aesica Pharmaceuticals at Queenborough site by over 10%.

Often, a lot of medicines go to waste in households. Pharma companies can use reverse logistic schemes to divert such unused medicines from standard household waste streams to those specifically designed for pharmaceutical products.

4.0 Sustainability in Water Management

Adoption of cutting-edge water treatment solutions enabling water reuse i.e., extract compliant purified water and sustainable wastewater systems will rise in pharmaceutical companies. This will help them to produce high-quality reusable water, control quality metrics i.e., total organic carbon, and adherence to environmental regulations.

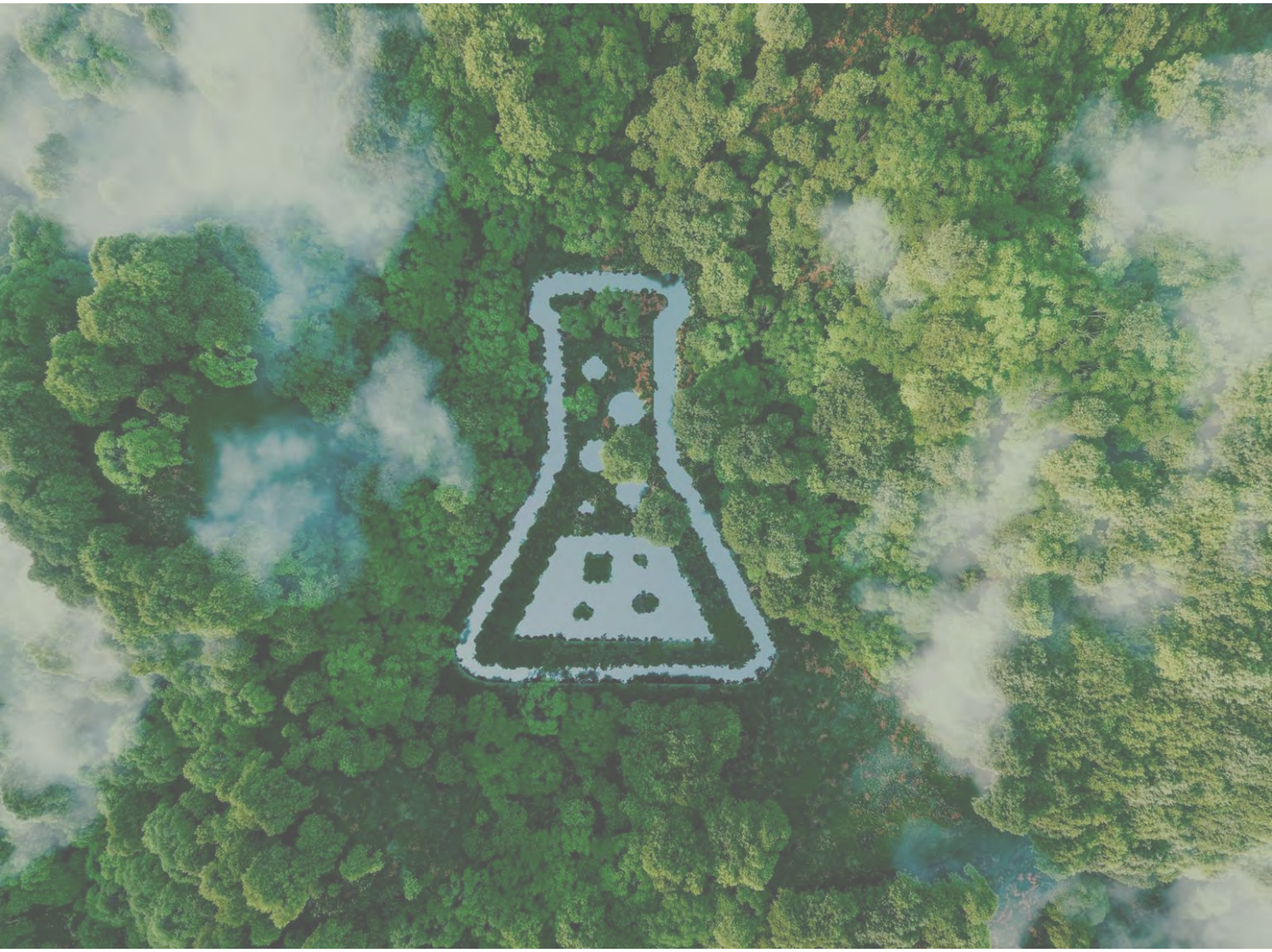
The treatment of wastewater generated by the pharmaceutical industry generally termed as water advocacy is a high priority area and attracts partnerships for water treatment technologies such as ozone treatment, activated carbon, UV, and sand filtration. Stakeholders in this stage include waste management companies, local municipalities, and recycling facilities, and waste management companies like Veolia. Recovery of biogas from wastewater is another key focus area.

Partnership with vendors of engineered clean water solutions like vapor compression is enabling to lower energy consumption in fill/finish manufacturing. Traditionally water-for-injection is done by multi effect distillation (MED),for medium or large-scale volume. However, vapor compression distillation (VCD) is more energy efficient e.g., Aqua-chem's VCD technology allows less pretreatment and no reverse osmosis requirement before VCD, meaning less water wasted and less energy is required to produce the same water quality.

Integrating sustainable technology into the fill-finish production is resulting in less raw material requirements (steel, plastics), less water to drain, less power (gas) to operate as small VCD can work with electricity (rather than gas) and supports pharma manufacturers in lowering their requirements for electrification of the entire facility.

5.0 Sustainability in Pharma Research

The pharmaceutical industry is shifting to a “benign-by-design” methodology, where scientists employ non-toxic tools/techniques/solvents to design drugs in a sustainable manner. Large pharmaceutical companies like Astra Zeneca and Pfizer are constantly innovating to limit their environmental impact through ‘green chemistry’ approaches. Focus on the discovery of heat-resistant drugs as an Environmental, Social, Governance (ESG) research strategy will save energy and cost during cold-chain transportation. AI-powered screening methods can improve the accuracy, predictability, and speed of drug discovery. Unique solutions around Internet of Things (IoT) sensors, cloud computing, smart devices (drones, sensors), and process automation will drive sustainability efforts of pharma operations. The end-to-end Pharma R&D process shall use the principles of sustainability by Design to limit environmental impact.



6.0 Indian Pharma Companies Getting Deeper into Sustainability, However Deeper Commitment Essential

Some of the bigger Indian pharma companies such as Cipla, Sun Pharma, Glenmark, DRL have focused on building sustainable environmental, social, and governance initiatives, aligned with the United Nations (UN) Sustainable Development Goals (SDGs) on climate action, responsible consumption & production, and good health & well-being.

From regulatory standpoint, Securities and Exchange Board of India (SEBI) has introduced a set of 9 principles that aim to guide companies in adopting sustainable business practices and reporting them in a transparent and comprehensive manner. This is great move to measure continuous progress and compliance to sustainability.

Looking at the ESG leader board, none of the pharma companies in India are 'leaders' in ESG performance based on fiscal 2021 data. This is based on CRISIL's Sustainability Yearbook 2021- 22 that comprised of about 33 listed pharma companies in India. It is also noteworthy that none of the pharma companies scored 'weak' or 'below average.'[17]

Several sustainability initiatives are in progress within Indian Pharma companies across the complete value chain (R&D, Manufacturing, Supply Chain). This is a good indication of the level of commitment shown by Indian companies towards sustainability. This would also help them to advance faster towards well-defined sustainability targets for 2025 to 2050.

Sustainability initiatives by Indian Pharma companies (non-exhaustive list):

Biocon: Namma Bio Community Initiative for Environment

DRL: Digital Light house initiative supporting R&D and Manufacturing and initiative around supply chain

Glenmark: Energy Digitalization Initiative within Manufacturing. and project Falcon for supply chain optimization

Sun Pharma: R&D Initiatives to reduce environmental footprint

Cipla and Sun Pharma are recognized to be sustainability advocates within Indian Pharma Industry. They do have a clearly defined agenda, targets, and action plan towards sustainability. Cipla has received recognition for its efforts, including being included in the Dow Jones Sustainability Emerging Markets Index and the Frost & Sullivan Sustainability Index.

6.1 Indicative Examples of Indian Pharma Companies Marching towards Sustainability

- **Growing renewable energy usage:** Cipla is acquiring 32.49% stake in India-based AMP Energy Green Eleven to build captive solar power plants for operations.
- Efficient operations: Piramal Pharma Solution's climate action is leading to process improvement, energy efficiency, and better stakeholder results; 15% year-on-year reduction in emission intensity in FY2023.
- **Smart manufacturing:** Leading Indian players investing in smart manufacturing technologies including Dr. Reddy's and Cipla. Six out of eight Industry 4.0 technologies i.e., advanced analytics, digital twins, robotic process automation, augmented/virtual/mixed reality, digital performance management, and industrial internet of things (IIoT) deployed at Dr. Reddy's Laboratories in Hyderabad.
- **Zero Liquid Discharge:** Glenmark adopted Zero Liquid Discharge (ZLD) approach in Aurangabad and Sikkim plant to reclaim water from wastewater and is available for recycle in boilers, cooling towers and gardening; helping to meet 38% of annual freshwater needs.

7.0 Key Opportunities for Indian Pharma Companies to Drive Sustainability

01 Power purchase agreements & enhanced usage of renewable energy

02 Establishing partnerships within pharma, onboarding green suppliers and elevating green transportation

03 Enhanced focus around Zero waste strategy & responsible water usage across complete value chain

04 Making R&D activities sustainable by utilizing principles of "Sustainability by Design"

05 Use of automation and digitalization across the value chain to reduce environmental footprints

End Notes:

This paper focusses mainly on environmental dimensions of sustainability. The Social & Governance elements have not been analyzed as part of this whitepaper.

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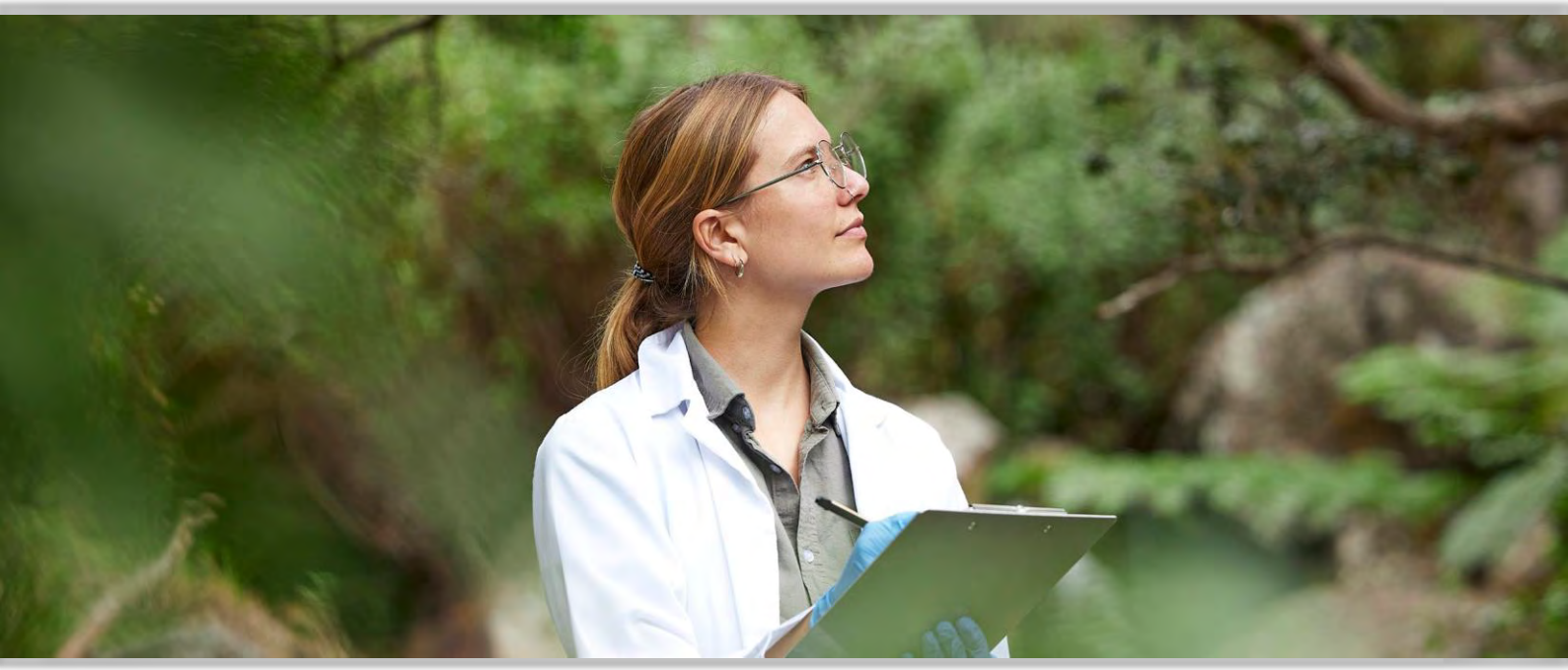

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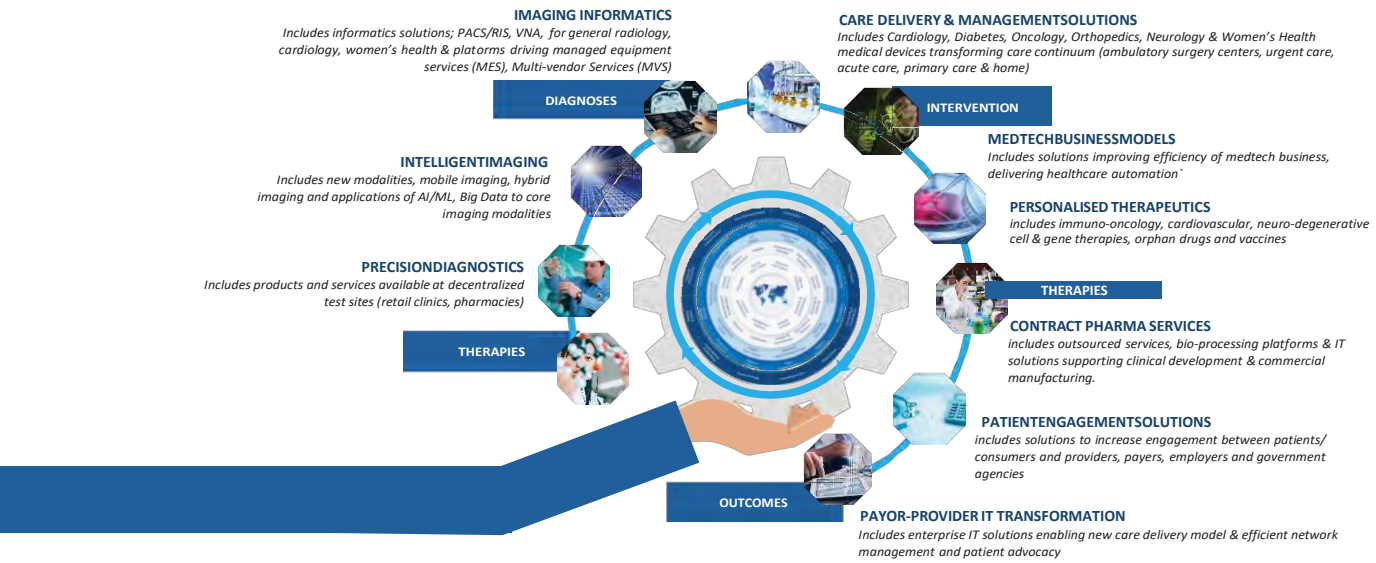
Healthcare & Life Sciences Analytics Value Proposition

360 ANALYSIS OF THE CARE CONTINUUM WITH A FOCUS ON MAXIMIZING FUTURE GROWTH POTENTIAL



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