

BI-MONTHLY INDUSTRY MAGAZINE



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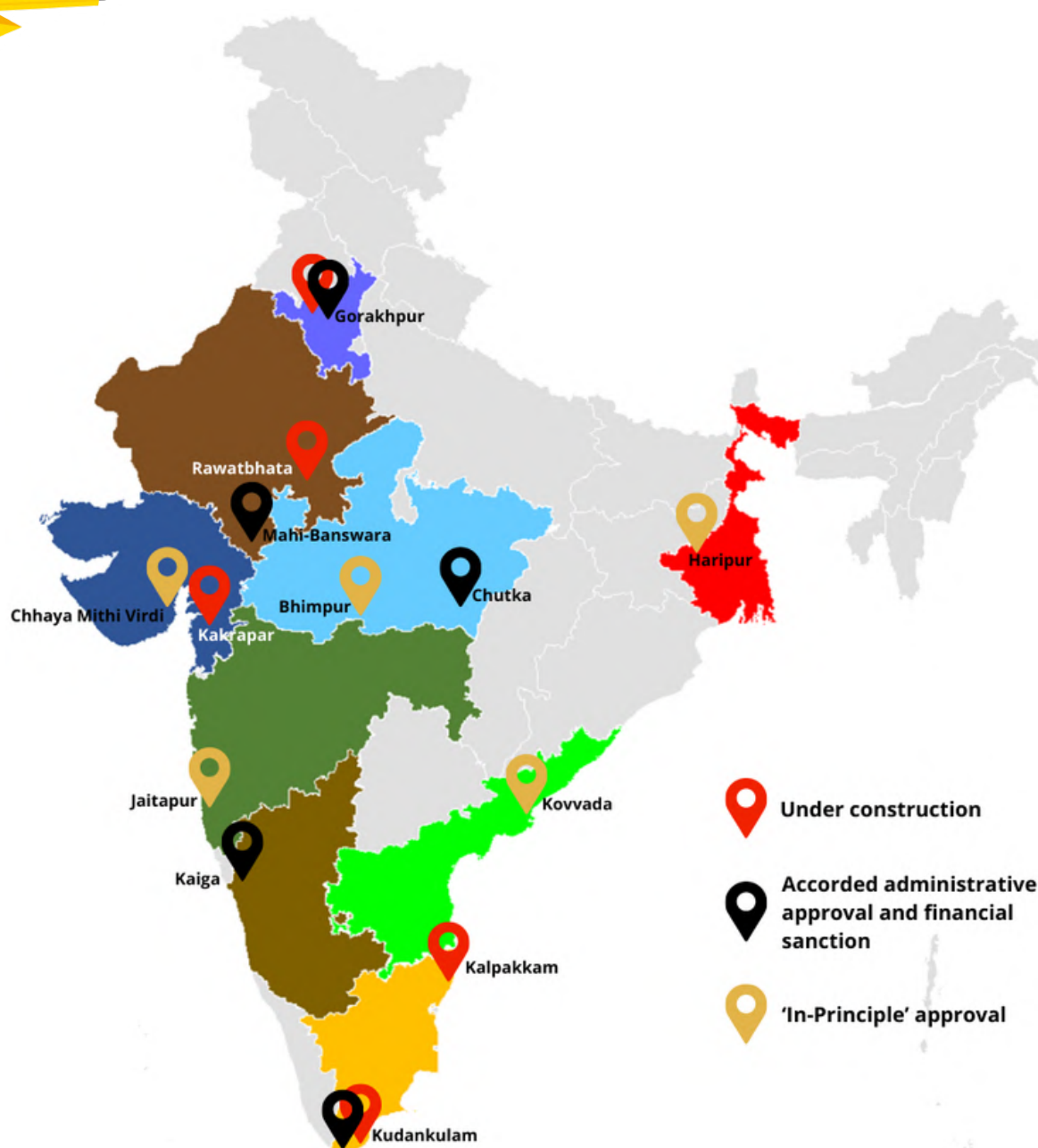
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# INDIA'S NUCLEAR LANDSCAPE

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Schematic view of India's upcoming nuclear facilities

# Understanding the **Biofuel Market** in India



## Interview with **Kishan Karunakaran** Founder & CEO, **Buyofuel**

*Coimbatore headquartered Buyofuel provides an online marketplace for biofuels. In an interview with Cleantech Hero, Kishan Karunakaran, CEO and Founder of Buyofuel, explains biofuel production, market trends, and how Buyofuel contributes to India's energy transition. The discussion throws light on the value chain, industry adoption, and regulatory impacts.*

**Can you briefly explain the complete value chain of one or two popular biofuels' production and usage?**

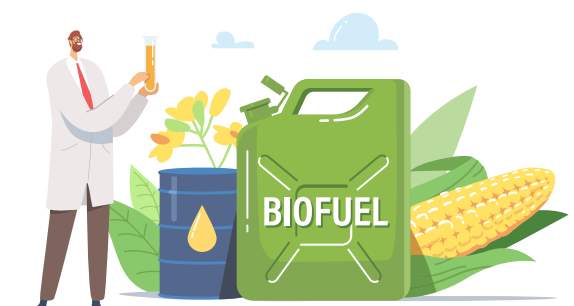
Value Chain for **Biomass Briquettes** - Biomass briquettes are produced from residues like **sawdust, rice husk, groundnut shells, and bagasse**, which are collected and processed. The raw material is dried, pulverized, and compacted into briquettes using high-pressure techniques or binding agents. These briquettes are then distributed to industries via wholesalers or platforms like Buyofuel. They serve as a cost-effective and **sustainable alternative to coal and wood**, finding use in sectors like cement, textiles, food processing, and power generation.

Value Chain for **Biodiesel** - Biodiesel production begins with sourcing feedstocks such as **Used Cooking Oil (UCO), animal tallow, and palm stearin**. Through transesterification, these oils are converted into biodiesel, with glycerin as a byproduct. The biodiesel is then stored in tanks and distributed through depots or suppliers. It is **used in diesel engines** across transportation, agricultural machinery, and generators, offering an eco-friendly alternative to conventional diesel.

Both value chains highlight the role of efficient sourcing, processing, and distribution in delivering sustainable energy solutions, with platforms like Buyofuel playing a crucial role in connecting suppliers and end-users.

**What is the current status of biofuels usage in India?**

Industries like **manufacturing, textiles, and power generation** are adopting biomass briquettes and pellets as sustainable alternatives to coal. Agricultural operations are also transitioning to biodiesel for tractors and pump sets.



The National Bio-Energy Mission and Biofuel Policy have set ambitious targets, such as achieving 20% ethanol blending in petrol (E20) by 2025 and increasing biodiesel usage in diesel. Ethanol production from sugarcane molasses and grains is expanding. India's focus on circular economy practices, waste-to-energy projects, and policy support is positioning biofuels as a critical component of the nation's energy transition and decarbonization goals.

### ***Which industries are inclining towards using biofuels for their energy requirements, and for what applications?***

- Key sectors adopting biofuels include manufacturing, using biomass briquettes and pellets in boilers and kilns, and textiles for steam generation in dyeing processes.
- Transport relies on biodiesel to power trucks, buses, and fleets, while power generation uses briquettes and biodiesel for renewable energy in thermal plants.
- In agriculture, biodiesel powers pump sets and tractors efficiently. This shift is driven by rising energy costs and government mandates like India's National Bio-Energy Mission and Biofuel Policy, promoting sustainable alternatives to fossil fuels.

### ***What are some of the unique features of your platform?***

Buyofuel's platform aggregates an extensive range of biofuels, each tailored to meet the diverse energy needs of industrial sectors. Buyers have access to real-time **updates on order execution, quality certifications, and logistical tracking**, enhancing supply chain confidence. BuyoTrace, our blockchain-based tracking tool, provides end-to-end traceability, allowing clients to verify the quality, origin, and environmental impact of each order. Our platform also enables **real-time emissions tracking**, a vital feature for industries striving to meet stringent sustainability targets. By substituting fossil fuels with biofuels, our clients monitor the environmental impact of their fuel choices directly on the platform, enhancing both ESG reporting and regulatory compliance. Additionally, **our curated marketplace connects vetted buyers and sellers, creating a reliable and efficient trading ecosystem**. Together, these features empower stakeholders to achieve their sustainability goals while ensuring a seamless, high-quality, and transparent trading experience.

### ***What types of fuels are transacted on your platform?***

Buyofuel facilitates transactions across **all types of biofuels**, making us a comprehensive platform for bioenergy solutions. While we cater to a broad spectrum of biofuels, we take pride in **leading the market in solid biofuels, including sawdust, wood chips, pellets, rice husk, and briquettes**. Additionally, we are pioneers in introducing unconventional biomass like mango seeds, guava seeds, and mustard husk into the energy stream.

In the liquid biofuel segment, Buyofuel enables the seamless transaction of used cooking oil (UCO), palm stearin, and biodiesel, ensuring their efficient integration into the energy sector.

## ***Who are the stakeholders that participate in the trading process on your platform?***

- On the consumer side, major industrial players participate as they increasingly co-fire biofuels to comply with regulatory mandates and meet sustainability goals. These industries span sectors like manufacturing, power generation, textiles, and transport, leveraging biofuels as a cost-effective and eco-friendly alternative to conventional fuels.
- On the supply side, biofuel manufacturers and suppliers play a crucial role in meeting the growing demand. They ensure a steady and diverse supply of biofuels, including biomass briquettes, pellets, biodiesel, and other innovative fuel types, enabling industries to transition smoothly toward sustainable energy practices.

Our platform bridges the gap between these stakeholders, fostering a seamless and efficient trading ecosystem that supports market growth and accelerates the adoption of biofuels

On our platform, the **average monthly transaction value is approximately ₹10 crore, with a transacted volume of around 10,000 metric tons (MT).**

## ***What trends do you see shaping the biofuels market over the next five years?***

The biofuels market is set for significant growth over the next five years, driven by policy support, technological advancements, and global sustainability goals. Governments are introducing stricter mandates like ethanol blending targets, carbon credit programs, and incentives to promote biofuels, while advanced biofuels derived from non-food feedstocks such as agricultural residues, algae, and municipal waste are gaining traction.

Hard-to-abate sectors like aviation, shipping, and heavy transport are increasingly adopting Sustainable Aviation Fuel (SAF) and marine biofuels to achieve decarbonization goals.

Technological innovations are expanding feedstock options, with unconventional materials like crop residues, mango seeds, mustard husk, and UCO being used in energy production, supporting circular economy initiatives. Digital platforms, such as Buyofuel, are streamlining biofuel transactions by bridging buyers and suppliers, enhancing market efficiency and accessibility. Additionally, a growing focus on carbon accounting and ESG compliance is driving industries to integrate biofuels into their emission reduction strategies. Rising international collaborations and investments are further accelerating the development of biofuel infrastructure, particularly in emerging markets. These trends will collectively position biofuels as a scalable, sustainable energy solution, playing a pivotal role in the global energy transition over the coming years.

## ***How do you anticipate regulatory changes affecting the biofuel industry?***

Regulatory changes are expected to significantly influence the biofuel industry, accelerating growth and adoption. **Blending mandates** (e.g., ethanol in petrol, biodiesel in diesel) and incentives for biofuel production are creating a favourable environment for investment and innovation.

Programs like India's National Bio-Energy Mission and Biofuel Policy are pushing for increased use of renewable energy, aligning with global carbon reduction targets.

Stricter emissions standards and carbon pricing mechanisms will further boost demand for biofuels as industries seek sustainable alternatives to fossil fuels.

Regulations emphasizing waste-to-energy initiatives, such as using Used Cooking Oil (UCO) for biodiesel, are encouraging feedstock diversification.

On the flip side, evolving international trade policies and certification requirements may pose compliance challenges but will ultimately strengthen the industry's credibility.

### ***What are your future growth plans?***

Our future growth plans are focused on driving the adoption of biofuels and expanding our reach. This includes **broadening our operations across multiple states in India** to ensure seamless access to biofuels nationwide.

Additionally, **cross-border transactions are in the pipeline**, enabling us to tap into international markets and strengthen the global biofuel trade.

We also aim to foster collaborations with various sustainability initiatives, government bodies, and industries committed to transitioning to renewable energy. By working closely with stakeholders, we plan to create synergies that accelerate the adoption of biofuels, contribute to decarbonization efforts, and support a sustainable energy ecosystem.



# BESS & Demand Response

## What's the Connection?



By **Simon Bushell**  
Founder & CEO, Sympower

Renewables comprise an increasing share of the energy mix globally, but their **intermittent nature, meaning renewable energy cannot consistently produce energy throughout the day upon request**, can unbalance grids. When energy demand does not align with renewables supply, the risk of blackouts increases. While other energy sources can compensate for the shortfall, keeping the lights on at peak times often requires expensive and polluting fossil fuels.

A just energy transition requires a fully sustainable energy system, and for that reason, we are seeing an increasing need for storage and flexibility to strengthen grids and enable more renewables to power them. An increasingly popular **solution is combining large-scale adoption of battery energy storage systems (BESS) and flexibility services, such as demand response.**

European countries are turning to BESS and flexibility solutions as a better way to manage increased demand while maintaining a balanced grid and a renewable and secure energy system. It's projected that by 2030, [Europe will add over 50GW](#) of BESS capacity.

### ***What is Demand Response?***

Simply put, demand response is a **change in electricity consumption by consumers**, such as commercial and industrial businesses, to help keep the supply and demand of electricity in balance. Balancing the grid is essential to ensure a secure, continuous energy supply. Maintaining a grid frequency of 50Hz has traditionally been achieved by fossil fuel power plants by increasing generation when demand is high and decreasing generation when demand slows.

Unlike gas and coal, renewables are not as easily dialled up or down as needed. However, the energy they generate can be stored, managed, and dispatched, while energy use is monitored and modified to keep the grid stable. **This is the goal of demand response programmes.**

At the energy consumer level, **demand response requires industrial and commercial businesses to shift their energy-intensive processes and the use of power-hungry equipment to off-peak times** when possible. Those energy-intensive consumers usually work with flexibility service providers and are paid by the grid operator for providing this service.

Flexibility services providers (like Sympower) can provide demand response on an even greater scale by aggregating larger numbers of individual energy users.

By monitoring and adjusting energy consumption in real-time and tapping into battery storage when necessary, such providers also enable real-time balancing of the grid frequency.

### ***What are BESS (Battery Energy Storage Systems)?***

Battery energy storage systems (BESS) support shifting energy consumption when demand is high and generation low by **storing excess energy when production is high for later use**. In times of peak energy use, a battery can respond to grid frequency deviations in about a quarter of a second. This makes them a keystone technology in providing real-time balancing of the grid.

Across Europe, BESS projects are seeing a new wave of investment. By 2030, Germany and Italy are projected to install about 21GW and 9GW of BESS, while Greece has a pipeline of BESS projects that amount to 27GW of storage.

Although BESS is set to scale dramatically, there are still major hurdles for the technology to overcome drawbacks.

- Firstly, battery infrastructure projects need **substantial investment** and enough market confidence that capital will be covered by future revenues.
- Secondly, the **raw materials required to build the technology are scarce and difficult to extract**. However, increased recycling schemes for lithium-ion batteries could alleviate some of these issues and lead to greater carbon savings as manufacturers find more effective ways to recycle materials. For example, in the Netherlands, the so-called “Buffalo” battery is expected to save up to 23,000 tonnes of CO2 emissions per year.

Today, BESS is the most common energy storage technology. Energy analysts and technologists say that advanced, more energy-dense batteries – along with energy management and flexibility – are the keys to integrating more clean energy into the grid.

### ***Combining BESS and demand response to drive the energy transition***

Demand response and BESS can be complementary technologies to scale up clean energy. Investment in BESS has ramped up significantly in recent years, and demand response is now being more widely adopted due to its accessibility, affordability, and effectiveness.

**Demand response is highly cost-effective as a flexibility solution because, unlike BESS, it doesn't require investment in new assets.** Instead, it unlocks the energy consumers' existing flexibility. Previously, large-scale industrial consumers have been the primary participants in demand response by carrying out manual load shedding in the event of an impending grid emergency.

Now, technological advancements have unlocked even greater potential for real-time energy monitoring and modification using much larger numbers of smaller-scale consumers.

**Europe and the United States are currently the global leaders in rolling out these demand response programmes.** The European Union has green-lit an action plan to digitise energy systems and open up data access for wider demand response across the bloc, and promote the use of energy-smart appliances to boost demand response participation.

Additionally, the European Commission approved a German measure allowing network operators to enter into flexible contracts with customers for a total of 1500 MW capacity, while the UK's National Grid Demand Flexibility Service enrolled 1.6 million participants last winter.



### ***Powerful Partners: Demand Response and BESS***

Managing energy through flexibility solutions is critical for the energy transition and a secure energy future. Responding to increased demand would conventionally mean building additional capacity, but this is no longer a practical approach. Modern grids must meet demand in a smarter way, utilising both flexibility solutions and BESS.

**BESS and demand response share complementary features: rapid response times, high ramp rate, and - unlike conventional generators - flexible upward and downward energy management.**

These abilities combined present a promising and powerful partnership to facilitate and integrate more renewables into the grid while balancing frequency during peak demand.

Using this two-pronged approach, battery storage can harness surplus energy at times of naturally low demand and release it at peak times, while demand response can collectively shift and monitor energy use to keep the grid balanced.

BESS is already being used to balance energy imbalances occurring over a time frame of up to four hours, and it can also be used to respond to shorter imbalances through flexibility services. In fact, the **International Energy Agency** [says](#) that **demand response and battery storage combined are expected to meet around a quarter of the world's grid flexibility needs by 2030**. By 2050, this could rise to half.



**This makes both demand response and BESS absolutely crucial, not just to the net-zero transition but to the stability of power grids around the world.**

Cleantech

Breakthrough 



To submit your inputs for this section,  
please write to us at

 [info@cleantechhero.com](mailto:info@cleantechhero.com)



# Plant Based **Bioleather** as an Alternative to Traditional Leather



## Interview with **Pritesh Mistry** Founder & CEO, **Bioleather**

**Bioleather** is a Mumbai-headquartered startup with a **processing facility in Surat**. The company makes carbon-neutral, vegan, biodegradable, and sustainable leather alternative products using microbes and plant-based materials.

***Can you tell us about the inspiration behind founding Bioleather and what motivated you to create a sustainable alternative to traditional leather?***

The journey started back in college when we visited many canaries as a project. Leather is a big factor in pollution, resulting in a lot of wastewater. Plus, there's the animal cruelty aspect. Another thing we came across was the post-harvest loss in agriculture. Out of 100 tonnes of fruits or vegetables, almost 30% goes to waste, and Bioleather was a great idea to tackle both these problems. We began with microbial leather in college and started plant-based leather in early 2022.

***What are the various source materials you use to create Bioleather?***

Microbial leather comprises water, sugar, and a bunch of microbes and is a lab-grown leather-like material.

The **flagship product of Bioleather is tomato-based leather**, which is pure PVC-free and 100% biodegradable. India is the second largest producer of tomatoes, and inedible tomatoes comprise 30-35% of the overall tomato harvest. By inedible tomatoes, we do not mean rotten tomatoes, but those which are not fit for consumption either because of their discolouration, low fragrance or lower sweetness levels. **Such tomatoes are pulverized, mixed with biopolymer, and put on top of cotton fabric to get the final product.**

Other than tomatoes, there are a variety of other sources with **mango** being one of them, since mango has one of the highest post harvest losses. **Most fruits which fall in the waste category and are not good enough to be sold can be used as source materials.** This also creates a source of income for farmers as we buy these fruits and vegetables which would have otherwise been wasted for them.



### ***How does Bioleather compare to traditional leather in terms of durability, comfort, and environmental impact?***



Bioleather's alligator skin plan based leather

- In terms of durability, you can use Bioleather for 4 to 5 years.
- When it comes to comfort, it is as similar as it can get to the original leather.
- In terms of environmental impact, **bioleather uses 90% less water, 80% less electricity, and almost 95% less land area.** When someone touches or feels Bioleather, it is almost the same as traditional leather.

### ***How does Bioleather compare to traditional leather products cost wise?***

When it comes to pricing, **Bioleather is quite in between PU or PVC leather**, which is a very cheap form of leather, and traditional real leather. It sits right in the middle when you look at the price point and costs about **INR 60 per square foot.**



Bioleather's shoulder bag made from tomatoes



Bioleather's ankle boot made from tomatoes

### ***What is the acceptance level among consumers for a switch to leather alternatives, and do you see this acceptance increasing?***

The acceptance level of bioleather and plant-based alternatives is increasing day-by-day. Usually, when people go out to the market to buy something new and innovative, they hesitate, and we need to do lots of convincing. However, the **leather industry has been declining for 5 straight years** in India now, and the margin levels have fallen down to single digits.

Earlier, it used to be a lucrative industry but the **exports have also gone down** because of the awareness about leather impact in European as well as the American market.



The industry is looking for alternatives and they don't like cheap quality PU and PVC leather. So, industries are switching to bioleather increasingly and experiencing an increase in their margins. As a result, the acceptance level for bioleather is going up. Another reason is that **PU / PVC-based cheap leather products start to peel off if we store them for a long duration, but plant-based leather does not face this issue.**

***What is your current scale of operations both in terms of volume & revenue?***

We have developed our own custom proprietary technology for making plant-based leather and have scaled it up to a **production capacity of 2000 meters per day.**

Currently, we are **producing around 10,000 meters per month** which is less than what we expect to do, but we plan to increase it as soon as we can.

If we talk about the revenue part, we have **crossed INR 2 Crores.**

***How do you see the market for sustainable materials evolving in the next few years, and what role will Bioleather play in this transformation?***

There is a huge potential in sustainable leather products and the growing demand of sustainable products around the globe is quite high. On the local front, the demand is low and we are very slow at adopting a sustainable mindset and products. Still, the **global demand is increasing very fast and our company is growing at a threefold quarter on quarter.** It is certainly going to be a huge market in the near future.

However, there haven't been any government initiatives or subsidies to support organizations so far.

***What are your future plans for Bioleather, and what new products or innovations can we expect to see?***

Our plan right now is to expand to every country. We started with a distributor model, and it is currently going on. However, we are **independently expanding towards European countries, Australia, UAE, and America.**

Almost **95% of our distribution happens online** as we are working on a new generation of products.

Currently, **most of our customers are export houses** that use our raw materials to make products and export them to other parts of the world. However, **we aim to directly sell products in the European and Australian markets** as they are quite geared towards sustainability.



# Cancrie | Advanced Battery Materials from Coconut Shells

*Excerpts from interaction with Dr. Akshay Jain, Mahi Singh and Amitej from Team Cancrie*



**Cancrie** is a Jaipur-based startup focused on developing **advanced materials for energy storage** solutions. The start-up recently raised **\$1.2 million** in a seed funding round led by Root Ventures. Cancrie was incorporated in August 2020 with a vision to commercialize the upcycling of waste into nanocarbons. Its patented technology **produces nanocarbon materials** from coconut shells.

*"Cancrie is a planet trillions of miles away, composed of the highest quality carbon materials, like diamonds and graphite, which are ideal for batteries. We say you don't need to travel trillions of miles to get premium-quality carbon — we are creating it here on Earth in Jaipur, Rajasthan."*

## **What is the science behind Cancrie carbons?**

From the material perspective, what makes our product so efficient for batteries is our patented process. **We start with waste and put it through nearly six stages to get the final product.**

In some stages, we enhance the waste to produce a high-quality precursor or char, which is essential for creating premium nanocarbons. The process involves fine-tuning seven critical parameters: surface area, pore size, pore volume, conductivity, functionalities, particle size, and purity levels. These parameters are crucial for battery performance, and our patented process allows us to optimize them to achieve superior results.



Properties such as surface area and pore volume are critical for battery performance. The main goal with the batteries is to provide current and capacity, which involves electrochemical reactions on the electrode surface. Imagine a battery with no surface or contact area for reactions — it would naturally deliver less current. **Our material addresses this by increasing the electrode's surface area and allowing more electrolytes to penetrate and access the active material inside. This significantly enhances the battery's specific energy and energy output.** In simple terms, that's how we optimize battery performance.

### ***What are the possible use cases for Cancrie's technology?***

When we first started, we focused on simple applications—using these carbons for water treatment, air purification, and even pharmaceuticals. We also used them as catalysts for enzymes. These applications showed fantastic results. As we developed premium, high-quality carbons, we found that even a tiny amount could significantly boost performance, leading us to identify our niche in batteries.

In terms of battery chemistries, these carbons have potential applications in lead-acid, lithium-ion, sodium-ion, redox flow batteries, fuel cells, and electrolyzers. We've already tested four of these — lead-acid, lithium-ion, sodium-ion, and flow batteries — and successfully developed a proof of concept (PoC), with commercialization now underway.

### ***Are there any downsides to using Cancrie carbons or specific challenges related to availability, sourcing, logistics etc?***

The primary challenge is the availability of Cancrie carbon itself since demand currently exceeds our production capacity.

As for waste sourcing, we've secured multiple sources over the past three years to ensure a consistent supply in terms of both quality and quantity. In terms of raw materials and machinery, everything is readily available in India, and we don't rely on a complex supply chain. So, the **main issue is scaling up production quickly to meet the growing demand.**

We've **tested the product for over three years, observing battery life cycles under actual conditions—not accelerated ones**—and the results have been excellent, with no detrimental effects. In fact, there are numerous advantages, such as improved charging efficiency and enhanced electrode strength.

One minor challenge arises from the slight difference in physical properties compared to other available carbons. This **requires a small adjustment in the manufacturing process** when incorporating the material. However, it doesn't involve major changes to the processing line and can be easily managed, making adoption relatively straightforward.



### ***Can you comment on efficiency and cost reduction that can be achieved through Cancrie?***

- **Increased Ah Efficiency** - One of the most critical metrics in batteries is ampere-hour efficiency, also known as coulombic efficiency. Typically, lead-acid and lithium-ion batteries in the market have a coulombic efficiency of around 90% to 95%. With our carbon technology, we consistently see an increase of about 5%. For instance, if a battery provides 92% efficiency, ours can achieve 97% to 98% efficiency, and in some cases, we've even reached 100% efficiency. For the end user, this means the energy put into the battery is exactly what you can withdraw—there is no need for extra energy input, which translates to lower energy bills.
- **Load Management** - Normally, if the e-rickshaw carries more passengers than the motor's capacity, it draws more current from the battery, reducing the battery's energy output. However, with our carbon technology, the battery retains its capacity and delivers the same mileage even under higher loads.
- **Battery's Cycle Life** - Recently, we achieved 1,200 cycles compared to around 960 cycles for a control battery. This represents a 30% increase in the battery's life cycle. For battery manufacturers, this means fewer warranty returns or the ability to upsell by offering extended warranty periods.

### ***Since Cancrie's product is made from waste materials, does it also help reduce the cost of battery production at scale?***



Due to its premium quality and advanced process, our material is **slightly more expensive** than other carbons available on the market. However, comparing the amount of material added and how much it impacts the overall battery cost is a more significant parameter.

For instance, if a battery costs ₹10,000, the additional cost of using our material is only around ₹10 to ₹20, which translates to just a 0.1% to 0.2% increase. The battery manufacturers we've spoken to find it a minimal expense. The real value lies in the benefits we offer—higher efficiency and a longer life cycle, which **significantly reduce warranty returns**. Additionally, our material **improves charge acceptance by 60% and increases electrode strength by four times**.

From the perspective of battery manufacturers, **extending the warranty period from 6 to 9 months allows them to upsell their batteries by ₹500 to ₹600**. It's a win-win scenario as they enhance their products' quality and profitability.



### ***What's the current scale of your operations?***

Currently, we are producing at a pilot scale of 50 kg per month. With the recent funding, **we plan to scale up to at least 500 kg to 1 ton per month by investing in larger machines. This capacity will roughly translate to catering to around 100,000 e-rickshaw batteries per month**, a target we aim to achieve within the next 4 to 5 months since we already have orders in hand. Looking further ahead, we plan to increase our production to 5 tons per month by 2027 within the same facility.

The market potential is significant— each major player like Livguard, Luminous, or Exide, **consumes around 10 tons of material per month for Indian production alone**. Beyond the large companies, there are numerous MSMEs and Tier 2 manufacturers as well.

By 2028, we are targeting a capacity of 20 tons per month. **We've already initiated discussions with the Rajasthan government and signed an MoU to acquire a larger facility for this expansion**. Given the current demand in India, which stands at 3 to 4 tons per day, and the fact that the Indian market only represents 5% of the global battery market, the demand potential is immense.

We're collaborating with several customers, including one based in Manesar, Gurgaon, and another in Pune. Additionally, product development trials were conducted with a manufacturer in Mumbai.

### ***How does your current capacity translate in terms of the number of batteries produced?***

The amount of carbon material required depends on the battery capacity. A 100 Ah battery uses a certain quantity, while a 200 Ah battery requires double that amount.

Let's take an **inverter battery** with a capacity of approximately 150 Ah as an example. We typically use around 20 grams of our carbon material per battery. **So far, we have deployed 35,000 batteries in the market, primarily in this segment**. This translates to roughly 35 megawatts of battery capacity already in use. At a production capacity of 500 kg per month, we will be able to cater to approximately **25,000 to 30,000 inverter batteries each month**.

**The environmental aspect of Cancrie's innovation** - Conventionally, people have been using carbons derived from fossil fuels as feedstock. However, our invention utilizes **lignocellulosic waste and biomass as precursors**, making it fundamentally different. This introduces unique properties and significantly reduces the greenhouse gas footprint.

We have conducted calculations and performed a life cycle analysis comparing our carbons with conventionally available ones. Our findings show that **our product has a 13-times lower carbon footprint when considering the precursor alone**. Additionally, by improving battery life and reducing the need for critical metals, we are effectively saving around 0.25 to 0.5 kg per battery. Looking ahead to 2030, we aim to achieve one gigaton of CO<sub>2</sub>-equivalent mitigation.

## **BUDGET 2025**

# **BUDGET REACTIONS FROM CLEANTECH INDUSTRY LEADERS**



## Dr. Miniya Chatterji

CEO, Sustain Labs Paris



"By prioritizing domestic production of solar PV cells, wind turbine generators, and other clean energy technologies under the National Manufacturing Mission to reduce imports, India is moving toward self-reliance and climate resilience. The push towards promoting sustainable farming practices with the aim of reaching around 1.7 crore farmers through Prime Minister Krishi Yojana has the potential to have a big catalytic effect on mitigating India's environmental challenges.

The target of 100GW nuclear energy by 2047 under the Nuclear Energy Mission will further add up to the country's transition to net-zero."



## Rajesh Gupta

Founder & Director, Recyclekaro



"The Union Budget 2025 takes a decisive step towards strengthening India's battery recycling and manufacturing ecosystem. The exemption of Basic Customs Duty (BCD) on critical minerals like cobalt, lithium-ion battery scrap, lead, and zinc will enhance domestic resource availability, reduce dependency on imports, and accelerate value addition within India. This move aligns with India's vision for a circular economy, fostering investment in battery recycling and EV supply chains. The addition of new capital goods for EV and mobile battery manufacturing will further boost local production and job creation."



## Abhishek Agashe

Co-founder & CEO at Elima



"With India generating over 3.2 million metric tonnes of e-waste annually, and a 73% surge in e-waste between 2019 and 2023, strengthening our domestic recycling infrastructure is no longer optional—it's a strategic necessity to power circular economy. The reduction of basic customs duty, with now 0% duty on imports of non-ferrous scrap (Lead, Zinc, Copper, Brass, and Lithium-Ion Battery Scrap), is a game-changer. This will boost the recycling ecosystem and significantly contribute to the 'Make in India' movement by increasing the availability of materials for local processing and manufacturing.

By promoting local production of solar PV cells, EV batteries, and energy storage solutions, the budget supports domestic value addition and boosts innovation."



## Praveen Kakulte

CEO, Powercon Group



"The Budget 2025 marks a crucial turning point in advancing India's clean energy goals. The strong focus on capacity building through National Centers of Excellence of Skilling across the country is a vital step to equip the nation with the specialized skills and deep domain expertise needed to build advanced power plants and optimize energy extraction. This commitment will play a key role in achieving India's Clean Power target of 500 GW by 2030 while maintaining cost efficiency.

With a clear roadmap in place, this budget sets the stage for India to 'generate more GWh of energy from every installed GW of power,' driving not only energy efficiency but also contributing to a greener, more sustainable future for generations to come. It's an investment in both the workforce and the future of India's energy landscape".



## Utkarsh Singh

Co-Founder & CEO, BatX



"By enabling the import and low-cost processing of lithium-ion battery scrap, the government has paved the way for India to become self-reliant in critical materials production.

The announcement aligns perfectly with the 'Make in India' initiative and the recently approved Critical Mineral Mission, reinforcing the nation's commitment to securing a sustainable and resilient supply chain for critical materials. At BatX Energies, we remain dedicated to building a sustainable future by extracting valuable resources from battery waste and driving the vision of Aatmanirbhar Bharat forward."



## N.P Ramesh

Co-Founder, Orb Energy



"With the 2025 budget announcement, Finance Minister Nirmala Sitharaman has set a clear path for India's clean tech revolution. The National Manufacturing Mission aims to accelerate domestic production of solar cells/panels, and EV storage batteries ensuring that India not only strengthens its 'Make in India' vision but also becomes a key player in global supply chains. The reduction of BCD on Lithium batteries is a very welcome step, as Storage goes along with increased adoption of renewable energy.

Alongside this, the focus on Industry 4.0 opens up exciting opportunities for our youth to lead the charge in innovation, creating a sustainable and energy-efficient future for generations to come".

# Tabreed is Bringing its District Cooling Systems to India



## Interview with **Sudheer Perla** Managing Director, **Tabreed Asia**

**T**abreed is a **UAE-based company** specializing in district cooling solutions across the UAE and other GCC countries. Now, Tabreed is aiming to establish partnerships with real estate companies and corporations to introduce district cooling systems in India

### **Could you provide us with a brief background about Tabreed?**

Tabreed is a UAE-based company listed on the Dubai Financial Market that has been operating for about 26 years. Essentially, **we are a cooling utility**—similar to power, gas, or water utilities found in other parts of the world. We specialize in designing, building, owning, and operating large-scale cooling infrastructure, commonly referred to as district cooling, and providing cooling as a service for space cooling requirements.



Our **installed asset base includes about 1.3 million tons of cooling infrastructure**. This enables us to provide cooling services for various real estate projects across the GCC, India, and Egypt. Currently, we deliver **cooling services to approximately 475 million square feet of built-up area**, including commercial buildings, malls, airports, public infrastructure like metro stations, hospitals, hotels, and more.

Some of our landmark projects in Dubai include the **Dubai Mall** and **Burj Khalifa**. Instead of developers setting up their own captive cooling systems, our approach offers a more energy-efficient, sustainable, and cost-effective alternative to meeting long-term cooling needs for buildings.

Globally, our primary shareholders include **Mubadala**, an investment arm of the Abu Dhabi Government, and **Engie**, a French company focused on renewable energy. These two entities, along with the public float in the UAE, form the majority of our ownership.

For **India** specifically, we have established a **joint venture with IFC**, creating a platform in Singapore called **Tabreed Asia**. Through this platform, we are focusing on investment opportunities and projects within India.

## ***Could you explain what exactly district cooling is? How does it differ from the cooling solutions provided to individual buildings or standalone institutional complexes?***

District cooling can be understood in two broad aspects: the technology and the business model. Essentially, district cooling addresses the growing need for thermal comfort and cooling. Traditionally, people plan standalone cooling systems using unitary window units, central plants in basements, or on-campus systems.

### **Technology Aspect**

**District cooling is a concept where the demand is aggregated instead of individual buildings managing their cooling demand separately.** This aggregation can happen on a small scale with three to four buildings or on a larger scale with hundreds of buildings, depending on the level of upfront planning. District cooling leverages scale and efficiency benefits by aggregating demand and using a centralized source for cooling production and supply. It involves planning a **central district cooling plant that produces cooling and supplies it to various buildings through an insulated pipe network.**

One key benefit of this approach is diversity. For example, a residential building may require cooling mostly at night, while an office building uses it during the day and a mall during the evenings. A district cooling plant serving all these buildings can significantly reduce the cooling capacity needed. On average, this approach can result in a **30% reduction in installed cooling capacity compared to individual systems.**

Additionally, the equipment used in district cooling systems, such as industrial-scale chillers, is far more energy-efficient than traditional alternatives. On average, district cooling systems reduce peak energy demand and overall energy consumption by up to 50% compared to standalone systems. This makes district cooling not only more sustainable but also **more cost-effective in the long run.**

### **Business Model Perspective**

Operators like us design, build, own, and operate these systems. We provide cooling as a metered service and charge based on agreed tariffs for consumption and demand. In this sense, **we function like a utility**, taking on the risks associated with designing and managing cooling systems.

Centralization of cooling infrastructure also opens up opportunities for diverse energy sources to power the cooling plants. For instance, we can utilize city gas for absorption-based cooling systems, grid power for vapour compression systems, or emerging waste-to-energy solutions. Renewable energy sources, such as solar or open-access electricity, are also viable options. This approach, referred to as **district energy**, allows us to combine multiple energy sources to meet cooling needs.

Since cooling essentially involves removing heat and humidity from indoor environments, **heat rejection is a critical component.** District cooling systems can utilize both air and water-based heat rejection methods. In many cases, plants include **captive sewage treatment facilities** to recycle

treated sewage effluent. This aligns with a circular model, particularly in the Indian context, where water recycling, open lakes, and water bodies can meet water requirements. By combining diverse power sources, efficient equipment, and circular practices, district cooling provides a cost-effective and energy-efficient way to meet urban cooling needs while promoting sustainability.

### ***Why do you think district cooling is relevant in India now?***

Just a few years ago—7 to 10 years back—**cooling was considered a luxury, more of a choice. However, it is now becoming an inevitable necessity**, especially given the last three summers, where thermal comfort has become essential in our urban built environments.

Cooling, in general, is increasingly becoming a central and essential need—not only in India but across the global south, including regions like Southeast Asia, South America, and Africa. These areas are witnessing an accelerating trend of rising temperatures and heat stress.

In India, over the last seven years, we've added significant renewable energy capacity. However, the **growth in cooling demand has been outpacing the growth in energy generation capacity**. Most of the renewable energy we are adding is consumed by cooling needs, whether for space cooling, data centers, or other energy-intensive applications. This summer, about one-fifth of our peak energy demand went towards cooling. The India Cooling Action Plan has forecasted that within the next 10 years, **45% of the country's peak energy demand will be allocated solely to cooling**.

Continuing with business-as-usual approaches—like installing window units, basement chillers, or simply aiming for green building certifications—will not help us achieve our climate goals. So far, energy efficiency discussions have been limited to technical fixes—like upgrading pumps, equipment, or automation—without addressing the demand side comprehensively. District cooling offers a large-scale, holistic solution to improving energy efficiency.



*Images for representation only*

Given the heat stress we face and the rising cooling demand, it's becoming inevitable for India to adopt district cooling more broadly. Otherwise, we risk being trapped in a self-fulfilling negative feedback loop, hindering our climate goals and people's basic requirements. This solution demands planning and a shift in approach, as it introduces a new sector and way of managing cooling.

I would encourage reframing the energy transition narrative into a "cooling transition." Focusing on a cooling transition would automatically address the energy transition more holistically.

## How do you aggregate the demand?

- We've been working with various think tanks, civil society organizations, universities, and government ministries to **raise awareness**, with the ultimate goal of pushing for some policy initiative. Through this engagement, for example, the **India Cooling Action Plan came out in 2019**, a very well-thought-out document from MIFCC (Member of the International Financial Consulting Committee), the ozone cell, addressing short, medium, and long-term interventions. And now, the **Bureau of Energy Efficiency is actively looking into this**. Earlier this year, they published district cooling guidelines, seeking feedback from the market before mandating it and making it more complex.
- We've also seen some states and cities take the lead in this area. **Tamil Nadu, for example, is actively addressing extreme heat** and looking at this more holistically. They have set up a District Cooling Committee under the State Planning Commission to assess what policy changes are needed, both on the generation side and for building planning and pollution control. They're including **district cooling as part of Chennai's new master plan**, which includes heat maps and zones for implementation. Wherever it makes sense for urban planning to include district cooling upfront, there should be a policy push.
- At the government entity level, such as SIDCs (State Industrial Development Corporations) and those planning industrial parks or large-scale real estate projects, we engage with them to offer investment, take on the risk, bring in FDI, and create new green jobs in an emerging sector. We've already been awarded two projects so far. The first was in **Amaravati, Andhra Pradesh**, where the state government and municipal corporation awarded us a **32-year contract to build and operate the cooling infrastructure**. A similar approach was taken in **Hyderabad, Pharma City**, for an industrial park. The city saw value in adopting district cooling because pharmaceutical manufacturing requires process cooling, which is inefficient if done individually.
- We are focusing on top-tier developers to encourage them to adopt an outsourced rather than an in-house model. We've signed a **30-year contract for a project in Gurgaon**. In this case, we don't call it district cooling but rather cooling as a service. We set up the cooling infrastructure within their campus, invest the money and recover it over 30 years. These projects are smaller in scale for us, but we're seeing a growing demand for cooling.

## How do you address the infrastructure requirements? For instance, if you need to provide district cooling in a densely populated commercial area, how do you approach that?

It completely varies depending on each location's specific characteristics. We have an MOU with Mahatma Phule Renewable Energy and Infrastructure Technology Limited (MAHAPREIT), a Maharashtra State Government entity, to **explore BKC as a potential site for retrofits and planning**. BKC, as a location, is quite suited for retrofits because there's at least some clarity regarding how the infrastructure was planned and how we can dig up and lay pipes.

But in general, retrofits in India would be pretty challenging.

In the Indian context, we typically see a significant amount of new construction happening, including data centres, airports, and so on. These are, of course, the easiest to implement because they can be designed to be future-proof, and this market alone could be huge. So, we don't necessarily need to rely on retrofits to scale.

### ***Are you primarily focusing on tier-I cities right now, and what are your plans?***



Our current focus is on the metros, specifically **Mumbai, Pune, Bangalore, and Hyderabad**. These are about 6 or 7 cities, which are already large markets. Within that, we're primarily targeting commercial and industrial customers—larger, more sophisticated ones—because this requires a systems-change approach compared to their current methods.



It becomes less challenging if the developer is sophisticated enough to understand the value proposition. So, that's where most of our focus is, along with specific cases like working with SIDCs and similar entities in certain states, such as MIDC in Maharashtra and TSIC in Telangana.

*Images for representation only*

### ***Have you observed any other specific challenges in the Indian market?***

Awareness and planning are the biggest missing pieces. There's also a tendency to stick to the status quo rather than embrace change. I think the **gaps we're seeing more and more are related to the general orientation towards quality and execution**. Across projects, contractors, OEMs, operators, IFMs, and so on, corners are often cut, and we tend to be penny-wise but pound-foolish. I wouldn't want to generalize, but we see it quite frequently. We also see a lot of competency gaps, especially in attracting **skilled workers to operate our plants**. Unless we take responsibility for addressing the competency and quality gaps in construction and commissioning, it becomes a challenge to build and operate plants the way we are used to doing outside.

However, the positive side is that, as a country of engineers with an orientation towards innovation, there's a strong focus on integrating new technologies. The creative solutions we can come up with here are not as easily found outside.

# Visit and Interaction with **Exigo Recycling**



## Interview with **Raman Sharma** MD, Exigo Recycling

***Exigo** is an e-waste recycling organisation headquartered in **Karnal, Haryana**. It is approved to handle 105 of the 106 different product categories identified by the Central Pollution Control Board. Exigo also provides Extended Producer Responsibility (EPR) services to organizations, including producers, OEMs, and importers, to help them prepare their EPR plans and meet their targets. Team CleantechHero visited their plant and met with Managing Director **Raman Sharma** to learn about their operations.*

### **What types of materials does Exigo recycle?**

Broadly summarizing, we deal with large appliances, small appliances, printed telecom equipment, lithium-ion batteries, plastics, some hazardous waste, and medical equipment.

The facility we are at today is built on nine acres of land and covers an area of approximately 200,000 square feet. It began operations in 2023. As for our first plant, we started e-waste recycling in 2012, so it's been a long journey.

### **Could you tell us where you source the products for recycling? And who do you sell the final recycled materials to?**

For procurement, we rely on both direct and indirect channels.

- By direct channels, I mean sourcing closer to the point of waste generation, such as manufacturing waste from electronics or other facilities, bulk consumers, or other sources of waste generation.
- Indirect sourcing, on the other hand, involves waste being collected through a chain of stakeholders. Since India still has a largely informal collection and recycling system, the informal sector collects the waste, which is then channelled to formal recycling setups like ours through an aggregation model. This process involves middlemen and aggregators who collect materials on a large scale from micro-collectors and transfer them to us regularly.

In terms of procurement, **Samsung**, **LG Electronics**, and many others in the industry are among our clients. **Oppe** has also been a long-time client of ours. The general practice is to have annual contracts. The pricing is usually revised on an annual basis.

As for the recovered materials, we have various offtake downstream agreements with industries. In some cases, the process follows a "cradle-to-cradle" model where recovered materials like **copper or aluminium from products such as cables and electronics are sent back into product manufacturing**, creating a circular system. In other cases, recovered commodities such as gold, lithium, cobalt, nickel, sulfate, and other salts are supplied to industries unrelated to the original product from which these materials were extracted.

***Could you also give us an idea of the current scale of your operations?***

We operate two recycling plants—one for electronic waste and another for lithium-ion batteries. Our total installed capacity is 76,000 metric tons per annum. For this fiscal year, ending in March 2025, we expect to recycle approximately 13,000 metric tons of material.



***Could you walk us through the end-to-end recycling process at your facility?***

- Once the material is collected, it is transported to our facility using trucks or other vehicles.
- Upon arrival, the vehicle is received at the weighbridge for weighing, and the goods are then moved into the warehouse.
- At the warehouse, the materials are unloaded and sorted into various categories. This is followed by pre-production planning to determine storage methods and the subsequent channelization of materials to specific downstream facilities within our plant.

- When the materials reach their designated areas, they undergo a process of "de-manufacturing". This essentially involves reversing the product assembly process. **We utilize manual dismantling for most items to maximize the recovery of valuable materials.**
- After dismantling, we create separate waste streams such as plastics, ferrous and non-ferrous metals, PCBs, and other components.
- These segregated waste streams are then directed to specialized downstream processing plants, where they are further treated to extract high-value commodities.

***Please also share the recovery rates for the different materials you've been able to achieve.***



- For products, we typically achieve a recovery rate of around 97 to 98%.
- The recovery rate for commodities can differ more significantly. For example, we achieve nearly 100% recovery with very little loss in the case of copper. For ferrous metals, aluminium, tin, and other noble metals, the recovery rate is close to 98%.
- However, in the case of plastics, we do experience some loss, with around 4 to 5% of weight lost during the processing stage.

That said, we closely track the net output from our facility and adhere to a strict **mass balance** concept, ensuring that **any losses are recovered by dust collectors or other pollution control equipment.**

**India has crossed 100 GW of installed solar power capacity**, marking a significant step toward achieving 500 GW of non-fossil fuel energy capacity by 2030. Solar power accounts for 47% of India's total installed renewable energy capacity.



- India's solar power capacity has increased from 2.82 GW in 2014 to 100.33 GW as of January 31, 2025.
- Currently, 84.1 GW of solar projects are under implementation, and 47.49 GW are under tendering.
- **In 2024, the country added 24.5 GW of solar capacity.**
- India's solar manufacturing capacity increased from 2 GW in 2014 to 60 GW in 2024. The government aims to achieve 100 GW of solar module production capacity by 2030.



**NTPC Green Energy** has entered into a Joint Venture with the New & Renewable Energy Development Corporation of **Andhra Pradesh** (NREDCAP) to develop large-scale energy projects across the state.

The collaboration is expected to attract an investment of **₹2 lakh crore**.

This partnership will focus on developing:

- 25 GW of renewable energy (RE) capacity
- 0.5 MMTPA of green hydrogen and its derivatives, and
- 10 GW of pumped storage projects (PSPs).



**First Green Hydrogen Project in Himachal Pradesh** | Foundation stone laid. A joint venture between **Oil India Limited** & **Himachal Pradesh Power Corporation** will execute the project.

- The plant will be built & operated by **h2e Power Systems**.
- Once operational, the plant will operate with a capacity of 423 kg of green hydrogen production per day at Dhabota in **Nalagarh District** in the **Solan** region.

**TP Solar**, a subsidiary of Tata Power Renewable Energy, has secured a contract with **Maharashtra State Power Generation Co.** to supply 300 MWp of ALMM-certified solar modules for the Mukhyamantri Saur Krushi Vahini Yojana 2.0 project. The contract is valued at nearly **INR 455 crores**. The modules will be delivered to various locations across Maharashtra this year as part of MSPGCL's larger 750 MWp tender.



TP Solar operates **India's largest solar cell and module manufacturing facility** in Tirunelveli, Tamil Nadu, with a capacity of 4.3 GW for each.



**NTPC** and the **Indian Army** have signed a 25-year Power Purchase Agreement for the sale of power (200 kW RE-RTC) from a solar-hydrogen-based Microgrid at Chushul (**Ladakh**).

The **Solar-hydrogen-based microgrid** offers a solution to replace the Army's existing diesel gensets, avoiding fossil fuel logistics arrangement and 1500 ton/year CO<sub>2</sub>. This is the **most unique hydrogen-based off-grid microgrid project**, located at an altitude of 4400m and with temperatures dipping to -30 degrees C in winter.

Shri Manohar Lal Khattar, Union Minister of Power and Housing & Urban Affairs, flagged off a **fleet of 5 hydrogen-powered buses of NTPC Limited at Leh** and inaugurated India's first Green Hydrogen fueling station in Nov 2024.

**Amara Raja Infra** set up the fuelling station, which can produce 80kg of GH<sub>2</sub> per day. **Ashok Leyland** supplied the 9M FCEV buses.



**Servotech Renewable Power System** secures **5.6 MW On-Grid Rooftop Solar Power Plant Project** from UREDA (**Uttarakhand** New and Renewable Energy Development Agency). The order is valued at **INR 30.2 crores**.

Servotech will be responsible for supplying, installing, net metering and commissioning on-grid rooftop solar power plants. The project also involves Servotech delivering warranty maintenance for the next 5 years, tending to 1 kW-1500 kW on-grid rooftop solar installations at various locations across the state.

U.S. President Donald Trump signed an executive order for the country's **withdrawal from the Paris Climate Agreement**, aligning the U.S. with Iran, Yemen, and Libya as the only nations not part of the accord.

The 2015 agreement, adopted by over 190 countries, seeks to limit global warming below 2°C. However, as a non-binding framework, it allows nations to set their own emission reduction targets.



The shifting sands of the US clean energy policy have led **Premier Energies to pause its planned 1GW solar cell manufacturing facility in the US**. Premier Energies had teamed up with North American solar module maker Heliene in July 2024 to establish the plant, aiming to leverage **incentives and tax breaks** for domestic clean energy manufacturing **under the Inflation Reduction Act**.

Uncertainty surrounding the Inflation Reduction Act incentives following recent policy changes has prompted a cautious approach. The company is now awaiting "full clarity" before proceeding.

In 2024, **solar power surpassed coal in electricity generation in the European Union for the first time**. According to Ember's European Electricity Review, solar energy accounted for **11% of the EU's electricity mix**, while coal's share fell below 10%.

EU's renewable sources have increased from 34% to 47% since 2019. Solar generation, the fastest-growing renewable energy source, grew by 22% compared to 2023. Wind energy now accounts for 17% of electricity generation in the EU, outpacing gas at 16%.



The UAE has officially launched a major **solar photovoltaic and battery storage project in Abu Dhabi**. This initiative, developed by Masdar (Abu Dhabi Future Energy Company) and Emirates Water and Electricity Company, aims to provide **renewable energy 24/7, producing up to 1 gigawatt of baseload power daily**.

To address the challenge of renewable energy intermittency, the project has a combined capacity of **5.2 GW of solar PV and 19 GWh of battery storage**.

## Google's first-ever large-scale purchase of carbon removal credits in India.

**Varaha**, a nature-based carbon removal company, has sold 100,000 **carbon dioxide removal (CDR) credits to Google**. The credits in this offtake agreement, to be delivered to Google by 2030, are generated from Varaha's industrial **Biochar** project in Gujarat.



Biochar is a stable form of carbon that can sequester carbon out of the atmosphere for centuries up to over a millennium. As corporate demand for durable carbon removal credits rises, biochar is attractive due to its permanence and affordability.



**Amazon** has announced investments in **three new wind energy projects in India**, solidifying its commitment to powering its operations with 100% renewable energy. The new projects include wind farms in **Karnataka, Maharashtra, and Tamil Nadu**, which are expected to contribute over **379 MW** of clean energy.

Amazon's renewable energy portfolio in India now comprises **53 solar and wind projects**, generating enough energy to power 1.3 million homes annually.

**Ashok Leyland** has secured the No. 1 global ranking in Sustainalytics' ESG Risk Rating for the Heavy Machinery and Trucks sector in Q3 FY25. The company aims to achieve carbon-neutral operations by 2030, commit to RE100 by 2030, and reach **net-zero emissions by 2048**.



JK Tyre & Industries becomes the first Indian tyre manufacturer and 16th Indian business to join the RE100 initiative. The company commits to being **carbon neutral by 2050 and using 100% renewable electricity by 2050**. Currently, 40% of the company's energy consumption comes from renewable sources.

To stay on course, the company has set a midterm goal (by FY'30) to reduce its GHG emission intensity by 50% compared to FY 2019.

# ATTERO

**Attero** has announced a partnership with the government to promote **sustainability for the upcoming 38th National Games**, scheduled from January 28 to February 14, 2025, in Uttarakhand. This initiative aims to make the event plastic-free and set a precedent for eco-conscious sports in India. The games will see participation from over 10,000 athletes across 38 sports.



Waste management solutions company **WeVOIS Labs** has secured **INR 36 crore** (USD 4.2 million) in its Series A funding round, led by Negen Capital and Vyom Partners, alongside participation from various esteemed investors, including Venture Catalysts++.

With over 1,500 sanitation workers and partnerships with 20+ municipal bodies, the company aims to establish 100 zero-waste cities within the next five years.

**SustVest**, a regulated platform for sustainable investments, has raised \$1.7 million in a Pre-Series A round led by **Inflection Point Ventures** and **Antler**, with participation from WEH Ventures, Venture Catalysts, Soonicorn Ventures, and FAAD Network. This funding, a mix of equity and debt, will support solar projects.



- ₹43 Crore in AUM and 9.3 MW of solar installations
- 12-14% XIRR returns for investors with monthly payouts
- Zero-cost solar adoption for C&I consumers, reducing electricity costs by up to 50%



The Indian Battery Manufacturers Association (IBMA) has shared the following recommendations to refine the Central Pollution Control Board Environmental Compensation guidelines.

- Avoiding double reimbursement by providing free EPR credits to manufacturers already managing recycling costs.
- Allowing market-driven pricing for EPR credits to balance compliance costs and consumer affordability.
- Expanding EPR credit eligibility to include all certified recycling processes to prevent shortages.
- Revising Copper-related EC calculations to reflect actual industry practices and costs.

Cabinet approves '**National Critical Mineral Mission**' to build a resilient value chain for critical mineral resources vital to green technologies, with an outlay of **INR 34,300 crore over seven years**. This includes an expenditure of INR 16,300 crore and an expected investment of INR 18,000 crore by PSUs.

In July 2024, the Finance Minister announced the establishment of the Critical Mineral Mission in the Union Budget for 2024-25. The government has already eliminated customs duties on the majority of critical minerals in the Union budget 2024-25.



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