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Trends, Analysis
Green Products
Entrepreneurship

Purpose
To excite entrepreneurs, executives and graduate students about immense opportunities in green business.

27 Technologies to Drive India's Renewable Energy Future

The **India Energy Transformation Platform** (IETP) for decarbonizing India has shortlisted 27 technologies and has made four recommendations that could help this country's transition to a low-carbon consumption society by 2030 more confidently. They span across generation, sector coupling and storage. See full list of technologies **here**.

IETP came up in February 2020. It's an informal, independent, and multi-stakeholder group of experts who aim to develop an informed narrative on India's strategies for meeting its Nationally Determined Contributions (NDCs) through non-linear, transformative solutions. This unique initiative intends to ensure that 'India stays ahead of the curve and cements its leadership in the global transition to clean energy – even beyond 2030.'

It's a bold attempt to explore non-linear thinking and focus on themes across the energy system.

IETP platform was conceived by the Swiss Agency for Development and Cooperation (**SDC**) and Shakti Sustainable Energy Foundation (**SSEF**), with

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the Bengaluru-based Center for Study of Science, Technology and Policy (**CSTEP**) as its secretariat. **www.ietp.in**.

IETP has identified four areas for research: urban space cooling; decentralized energy systems; technologies for renewable energy (RE); and energy efficiency in industrial processes.

It's key recommendations are:

- Develop a roadmap for concurrent deployment of complementary storage solutions, including pumped storage, power to hydrogen, and batteries.
- Establish standard guidelines for procurement of storage solutions.
- Increase investments in R&D for technologies to enable this transition.
- Create an enabling ecosystem (markets) for emerging technologies like hydrogen

These recommendations are timely as India has no choice but to learn to align its goals to achieve optimum outcome. The report notes: "Renewable energy will continue to play a crucial role in fulfilling India's NDC commitment of reducing the energy intensity of its GDP by 33 to 35 percent from the 2005 levels (by 2030). Having set ambitious goals for a RE-dominant energy sector, India needs to look at enabling this transition promptly.

The platform founders believe that India's energy transition towards sustainable energy systems should look beyond the NDCs and 2030 timeline. "It must take advantage of technology developments around the world to leapfrog into an advanced system that brings a better quality of life to all its citizens."

This can happen if India looks –

1) Beyond urgent and short-term priorities
2) Envision completely different paradigm for planning and operation of energy systems
3) Identify innovative business models in the organized and unorganized markets
4) Identify "triggers" for transitions and develop a collective vision to take on the alternate paradigms

Race to Net-Zero Carbon Future Daunting

While immense benefits of net zero carbon looks juicy businesses have a daunting task ahead of them. Their job looks complex and tricky primarily because the policy and technology ecosystem is struggling to balance demand and supply challenges.

Anvesha Thakker at KPMG IMPACT puts it succinctly, "Net-Zero pathways will require businesses to consider both demand side as well as supply side measures. In this journey, decarbonization technologies such as renewable energy, demand electrification, CCUS (carbon capture, utilization and storage), hydrogen, biofuels (and others) may compete but will also complement with the right ecosystem enablers. Businesses will need to manage this interplay while considering the alignment of their investment horizons with the maturity curves of various technologies. They may also need to hedge their bets across technological spectrum. Government has to facilitate this journey through right policy and fiscal measures."

While the central and state governments have been aggressive, especially in promoting renewable energy, they are struggling to align the interests of all the stakeholders. Policy ambiguity, slow response to changing tech environment and reluctance to take politically-difficult decisions are hampering the speed of India's march to net-zero carbon economy.

KPMG has captured the challenges in its report titled **'Decarbonizing growth – Managing the transition'** eloquently. The report highlights the importance for businesses to identify their strategies and portfolios of technologies to meet their respective net zero targets. It discusses the imperatives of a system perspective that incorporates energy demand management, improving energy efficiency and increasing the share of clean energy in the overall energy mix.

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Santhosh Jayaram, also with KPMG, notes, "The price of carbon will have to be internalized and is no longer an externality. It dwells into potential technological roadmaps in the journey. It concludes with the emphasis that all actors have a role to play in achieving the outcome."

Key highlights

- The transition to a sustainable future, characterized by "Net Zero" is inevitable and beginning to reverberate both upstream as well as downstream owing to globally integrated supply chains
- Large global corporations have started to urge their suppliers to reduce their carbon footprint as part of their own decarbonization strategy, which is likely to result in a domino impact on smaller nations and companies
- Harder to abate sectors are also taking bolder steps to tackle the climate agenda
- More private sector commitments are coming in and sectoral decarbonization discussions are picking up
- Decarbonization technologies are fast gaining ground. Sector specific measures on the demand side and energy efficiency will continue to see impact and largely align with investment and retrofit cycles. CCUS (Carbon capture, utilization and storage) and hydrogen will co-exist to play a key balancing role in hard to decarbonize sectors with impact felt post 2030
- Electrification of end use sectors such as transport and industries will need to be supported by massive adoption of RE and its integration will require both batteries and hydrogen to come in based on application required (ranging from frequency response, to seasonal storage)
- CCUS will find a strong focus in decarbonization of industrial sectors especially hard to abate sectors for capture of emissions and deployment in blue hydrogen production
- Green hydrogen may cannibalize some of the growth of CCUS but may co-exist as hydrogen will not be able to cater to all industrial processes
- **Government, financiers, industry, consumers will need to act together to make the transition happen**
- The eco-system comprising of policy, technology, market, investments, standards and society has to work together in a complementary manner in this transition journey
- The option of cross-boundary collaborations and market mechanisms will have to be evolved even in the current geo-political dynamics as world trade is still dispersed around the globe
- Universally acceptable standards to measure and navigate the journey are important to ensure transparency and accountability. Standards also will help in benchmarking and monitoring of progress
- Corporates need to assess the full impact of climate risk including physical as well as transitional risk and make implementable strategies to move towards net- zero
- Businesses are increasingly acknowledging that decarbonization may entail a fundamental transformation in business portfolio
- Corporates are looking to decarbonize not only their businesses but their wider supply chain
- Harder to abate sectors are also taking bolder steps to tackle the climate agenda – The biggest hurdles in achieving meaningful decarbonization may yet be faced by harder-to-abate industries such steel, cement, aviation, shipping, etc.

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Financial Impact

Transition to net-zero will require a significant transformation across the organization with massive reallocation of capital which is likely to create unprecedented challenges.

- **Vision and targets:** Businesses need to appreciate the deep financial impact of climate risks and make climate change their pressing agenda with clear vision and targets
- **Business portfolio diversification** will need to be a key part of business strategy, especially in the energy sector where a substantial part of the emissions comes from the use of the products
- **Supply chain:** Companies need to look beyond their emissions to the wider supply chain. It is imperative that companies work with stakeholders across its value chain to incentivize them to introduce green interventions at every step
- **Technology:** Businesses will need to evaluate and plan their technological pathways to decarbonization. As the digital revolution catches up with the sector, boundaries will blur with new areas of competition. Businesses will have no choice but to anticipate and plan for a change in their business models.
- **Structure:** There have to be radically altered organizational arrangements that align to the business imperatives arising from climate change and the need for a deep focus on innovation and agility
- **ESG:** ESG is no longer a matter of mere compliance. ESG has taken a centerstage in the energy transition/ decarbonization process and a critical link between financing and ESG that has emerged

Technology Challenge

- The four dominant clean energy technology pathways
- **Electrification** of end use sectors
- **Carbon capture, utilization and storage (CCUS)** will be a crucial enabler for achieving net-zero – CCUS is a critical technology for decarbonizing hard-to-abate sectors (for instance, steel, cement) and is one of the few technologies that can abate emissions from fossil fuel-based power generation – while renewable energy adoption is planned in a big way, it may not completely usurp the stranglehold of coal and gas-based power plants for many decades
- **Hydrogen** is expected to play a key role as an energy vector in the on-going energy transition – Green hydrogen will help decarbonize hard to decarbonize energy consuming sectors such as transport and industries through sector coupling
- **Bioenergy:** Use of biofuels in transport applications is expected to show the strongest growth and is expected to play an important role in decarbonization of some hard-to-abate sectors such as shipping, aviation, heavy transport. Technologies for generating biofuels from industrial waste have been generating significant interest and these transcend the limitation of availability of organic biomass

Companies need to select and back R&D efforts required for bringing technologies to market based on investment cycles

See full report: **KPMG Report**

CII Offers Good Governance Certificate to Exporters to Boost Growth

India's declining export growth could get a leg up if exporters choose to avail of certification from Confederation of Indian Industry for following good governance practices that include environment sustainability.

Called the **"CII Responsible Export Organization Certification Scheme"** the certificate provides 'a single framework for demonstrating compliance and maturity of Indian export organizations towards meeting global market expectations on business and societal performance.'

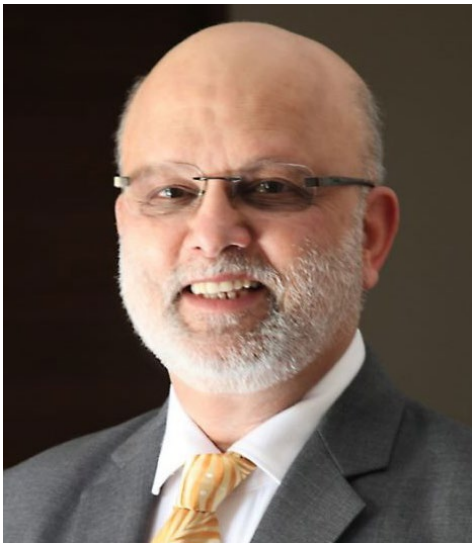
CII said the scheme is based on a comprehensive assessment of the organization's systems for governance, management, operations and consistency in delivered results through assessment uses simplified, cost-effective, easy to practice criteria & evaluation processes to enable wide participation from the existing and potential export organizations

The scheme is open to **manufacturing organizations** registered and operating in India and should have completed a minimum of two years in operations including supplies (Domestic, Export or both) with audited accounts. **The benefits** of this scheme include:

- Certification from CII as a Responsible Export Organization
- Active promotion by CII International offices in Conferences, Trade shows, Exhibitions
- Linking with other Export Promotion bodies
- Consistency in quality, delivery and service
- Compliance with regulatory requirements.

www.cii.in

Praj Ranked Second Hot Bio-Economy Firm



Dr. Pramod Chaudhari
Founder Chairman, Praj

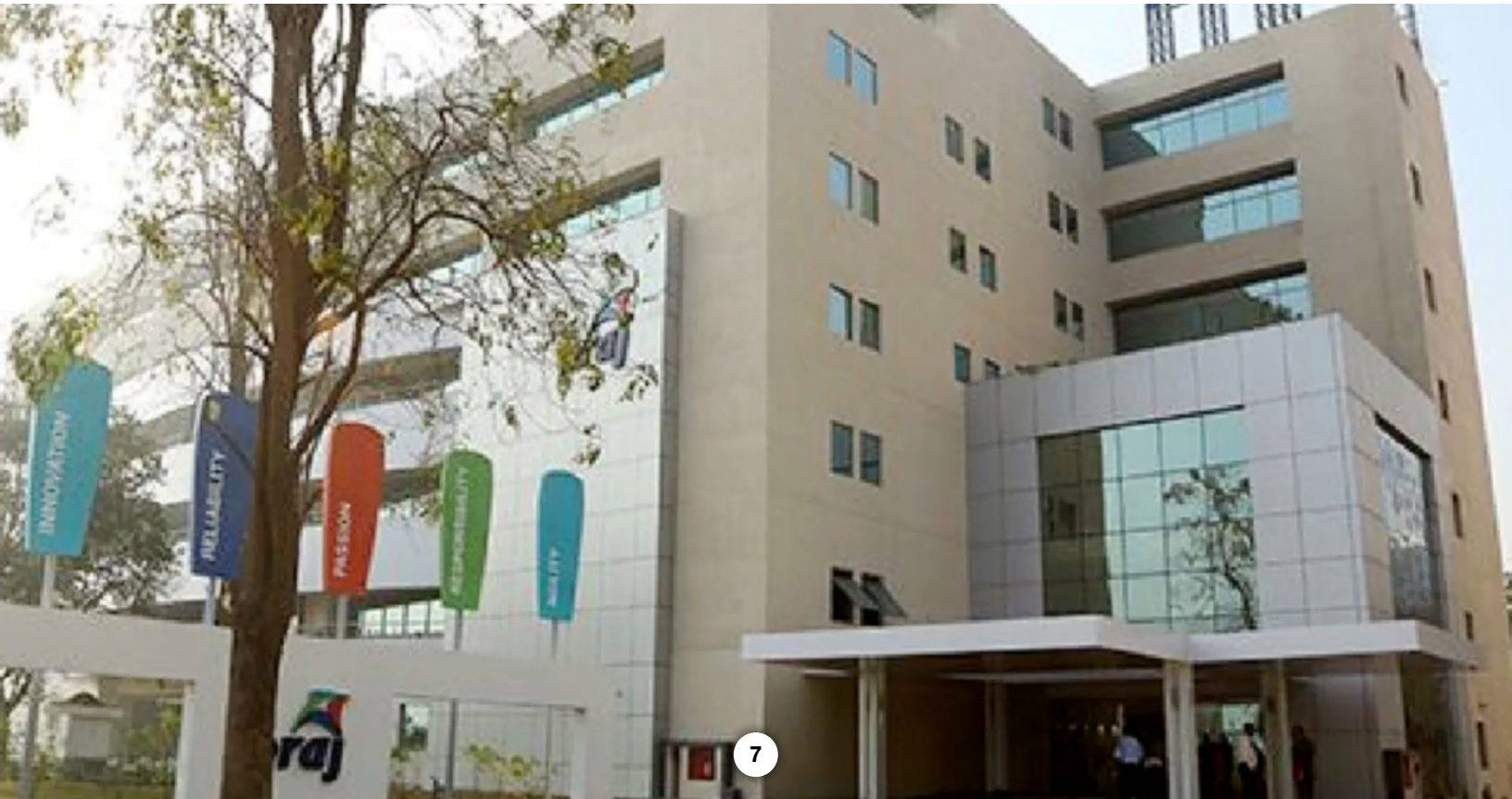
US based **Biofuels Digest** has ranked **Praj Industries** second in its top 50 hot global bio-economy companies to watch out for in 2021 in the low carbon fuels and renewable chemicals category. It was ranked 34 in 2018 and 8th in 2019.

Praj has also been ranked third in the newly introduced Biodesign & Engineering category that recognizes hottest companies for their capabilities in innovations and services in commercial-scale operations and products.

A proud **Dr. Pramod Chaudhari, Founder Chairman, Praj** said, "I see this as recognition of Praj's vision of offering environment-friendly and sustainable solutions to make the world a better place. With this honor comes a greater expectations from stakeholders and team Praj is well geared to come good on the promise."

Dr. Chaudhari was conferred with George Washington Carver Award 2020 for his outstanding contribution in the industrial biotechnology sector worldwide.

Jim Lane, editor and publisher of Biofuels Digest noted, "It's the highest ranking ever achieved by a company out of Asia, and the highest ever for an engineering services company."



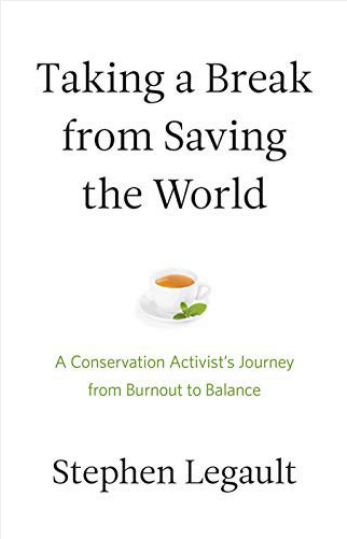
Godrej is Finalist in World GBC Award

Godrej & Boyce, the flagship company of the **Godrej Group**, is the only company from India to be featured among the finalists for the prestigious World **Green Building Council** (GBC) Asia Pacific Leadership in Green Building Awards 2020, that celebrates Asia Pacific's brightest achievements towards a more sustainable built environment. They have been recognised as finalists under the **'Business Leadership in Sustainability' and 'Leadership in Sustainable Design and Performance'** categories.

The awardees found Godrej truly integrating sustainability into its business models and contributing in the transition towards a sustainably-built- environment. Its Plant 13 Annexe building located at Vikhroli (Mumbai) was nominated as a finalist in the **Leadership in Sustainable Design and Performance Award** category, which recognizes pioneering green building projects that deliver a range of benefits through a holistic approach to sustainability.

George Menezes, COO – Godrej Electricals & Electronics, said, *"We have always aimed to continuously setting newer and better standards for sustainability within the industry by considering factors that lead to positive outcomes for both the planet and its people."*

One of India's oldest business groups, Godrej set up India's first Net Zero Carbon building under the Indian Green Building Council (IGBC) rating system and partnered with the World Green Building Council to promote Net Zero buildings across the Asia-Pacific region. It recognises that business and sustainability go together. It recently pledged to double its energy productivity by 2030. It is part of the Global EP100 initiative led by the Climate Group.



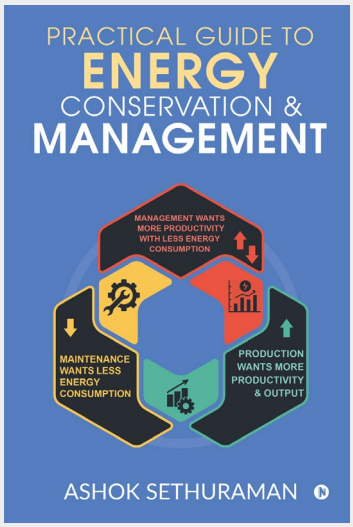
Conservation Activist's Journey from Burnout to Balance

Stephen Legault, Rocky Mountain Books; 1st edition, April 2020

A veteran of burnout himself, Legault looks at the culture of self-sacrifice that permeates the work done by volunteers and paid staff in the environmental conservation movement, and dissects how to manage our own time, energy, and commitment to our causes. Following a river-running metaphor, and proposing a variety of techniques to help with various states of anxiety resulting from burnout, including clarity of purpose, recognition of limits, fitness and diet, meditation and yoga, as well as organizational structural changes such as leave-of-absence policies, Legault encourages readers to find time to "eddy out"—to rest a moment in quieter waters and scout downriver—to ensure our lifetime of engagement is fulfilling, effective, and self-sustaining.

Just as with teachers, nurses, doctors, lawyers, paramedics, steelworkers, students, and airline pilots, burnout is a growing concern in many social-change circles. This book takes a look at the impacts of eco-anxiety, over-work, and the associated stress surrounding the present and future state of the environment and offers practical and insightful suggestions on how to deal with it.

Stephen Legault is a full-time conservation activist, writer, photographer, and organizational development consultant. He is the author of *Running Toward Stillness*, a meditation on Buddhist spiritual practice, running, and parenthood, as well as several photography books, including *Earth and Sky: Photographs and Stories from Montana and Alberta and Where Rivers Meet: Photographs and Stories from the Bow Valley and Kananaskis Country.*



Practical Guide to Energy Conservation & Management

Notion Press

Practical Guide to Energy Conservation & Management propels you to pluck the low hanging fruits of energy conservation in your industry. Until now, though the fruits are visible to you, you thought that they are beyond your hands' reach. Having done Energy Audits in more than four hundreds of industries with the BEE certification and guidance from their Guide Books, I suggest to the Field Engineers that there is plenty of scope for Energy Conservation by the condition-monitoring approach in your utility and production departments. This book will be an eye-opener for you, to instantly reduce the energy losses happening for many years and in turn, this will restore your productivity, thus giving you a pleasant surprise.

The three stages of accepting results of the Energy Study – Shock, Relief and, finally, Delight! When you have implemented energy conservation, first you will be shocked to discover the amount of energy losses overall these years. Today you feel a relief that you have reduced those losses. Tomorrow will be a delight to your team to visualize the reduction in energy consumption. This book will guide you to achieve energy conservation easily, instantly, smoothly and cost-effectively.

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