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ENERGY

The Complete Energy Magazine

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FUTURE

COVER STORY

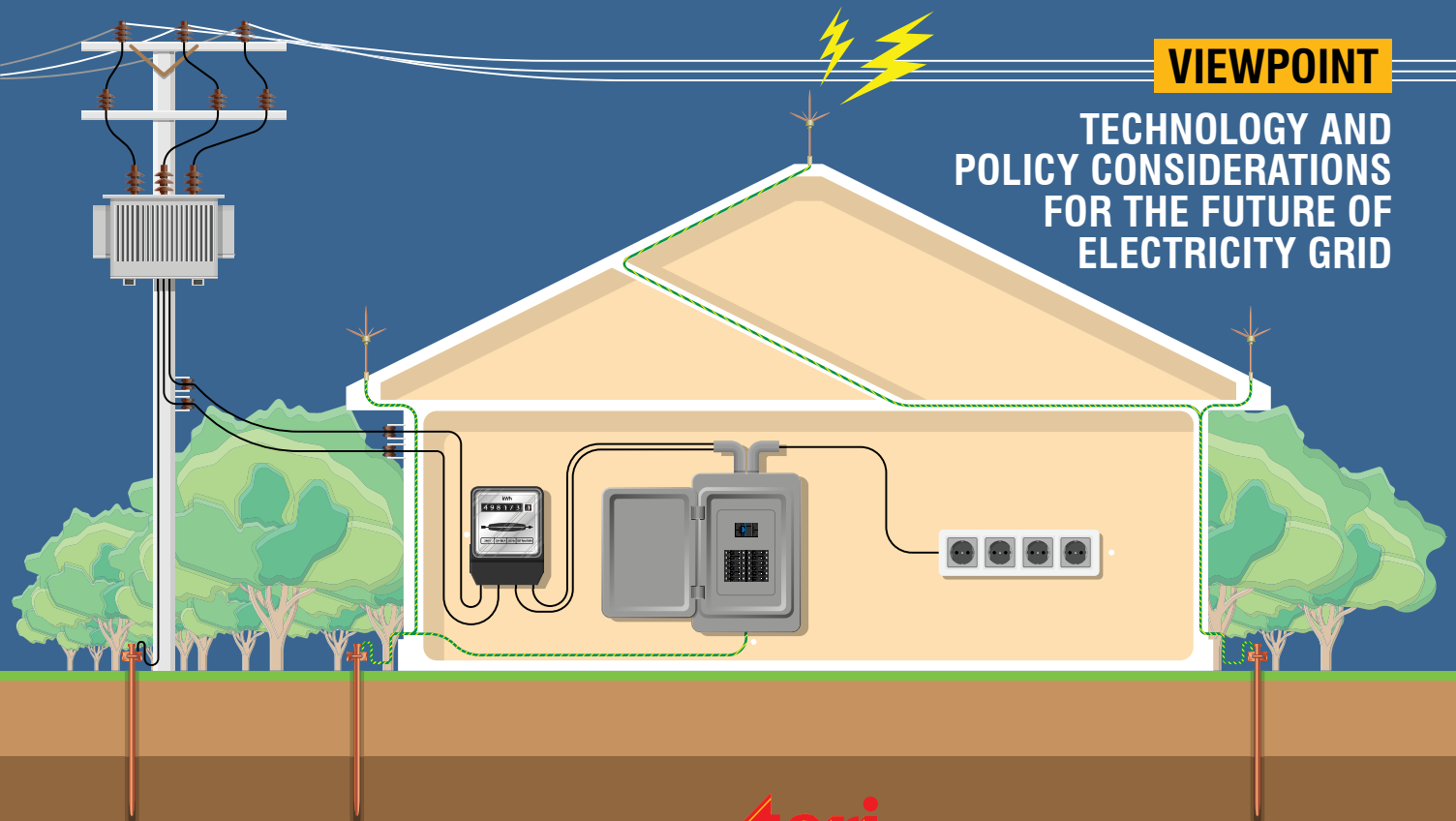
**TECHNOLOGY
TRANSITIONS IN THE
ELECTRICITY SECTOR**

FEATURE

**BATTERY STORAGE AND
OPERATIONAL USE-CASES AT
ELECTRICITY DISTRIBUTION
NETWORK LEVEL**

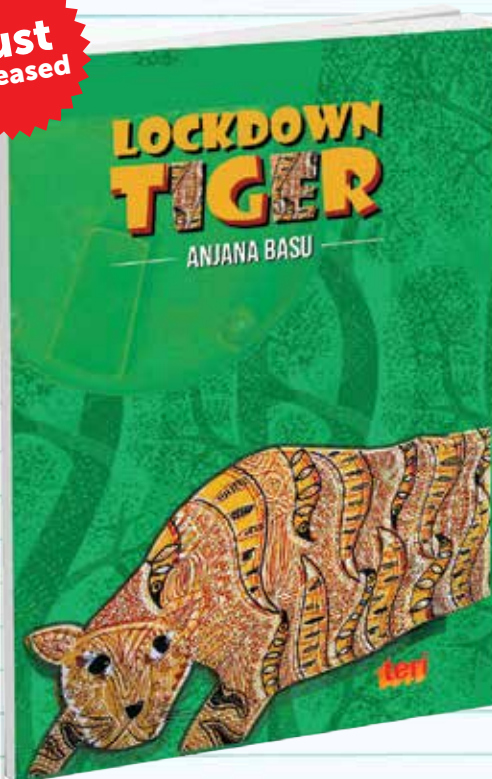
VIEWPOINT

**TECHNOLOGY AND
POLICY CONSIDERATIONS
FOR THE FUTURE OF
ELECTRICITY GRID**



Join Manjul, Rohan and Carpet Sahib in their Adventure to Save a Tiger Cub

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- Realizes the spirit of adventure which is locked up inside children
- Sparks interest in children about nature and wildlife
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- Educates children about illegal wildlife trade

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It was a young tiger barely old enough to hunt for itself. It was still very confused as to how it had got itself into this narrow space. A tiger is kidnapped and so is a girl - though not at the same time. They find themselves sharing isolation in a hunting lodge that is rumoured to be haunted, at the mercy of an unknown enemy. Who has locked them in and why? What happens when a young tiger is terrified out of its wits and a girl finds herself locked in and forced to fend for herself? Perhaps call for a ghost to come to the rescue?

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From the editor's desk...

Energy transition has become a buzz-term nowadays, especially in the context of net-zero emissions ambitions. The fact that we have been able to realistically imagine a future based on clean energy - as opposed to the present one that is predominantly dependent on fossil fuels - speaks volumes about the recent technological advances. Not only renewable energy technologies, notably solar and wind, have become cost-efficient but the key enablers like intelligent grid management systems too progressed to a level where their combined effect has been greater than the sum of the constituents. But energy transition is not simply about changes in sources of electricity generation. Thus, energy transition has to deal not only with supply-side options (renewable energy and other cleaner options) but also with demand-side management, including adoption of energy efficient processes and value-chains. And there is more to it than only technology transition. Since any economic system is not uni-dimensional, energy transition too entails social dimensions.

The social costs of energy transition must be viewed at two distinct levels. First, the envisaged energy transition addresses energy poverty and energy access squarely. So, while transiting to clean energy, the principle of 'no one is left behind' has to follow in terms of affordable, reliable, and on-demand energy supply. The second level pertains to the populace and communities affected by this shift. If one looks at it closely, one would realize that the issues here are developmental ones only, ranging from lack of basic infrastructure to livelihood opportunities. These challenges require a well-coordinated approach. And more importantly, while discussing energy transition or net-zero targets, we must not lose sight of the fact that electricity is but only one component of energy. Particularly from the Indian perspective it is equally important to consider energy in cooking and industrial sectors - especially MSMEs. Ultimately, energy future is intrinsically linked with the overall wellbeing of the economy.

Amit Kumar

Amit Kumar

Senior Director, Social Transformation, TERI

Editor: Amit Kumar Radheyshayam Nigam

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“ The theme of the January-March 2021 issue of Energy Future is quite apt indeed. In fact, air pollution in India is a very serious problem. I have read that rising urbanization, booming industrialization, and associated anthropogenic activities are the prime reasons that lead to air pollutant emissions and poor air quality. Air pollution is one of the key global health and environmental concerns and has been ranked among the top five global risk factors of mortality by the Health Effects Institute (HEI 2019). Over the years, there has been a massive-scale expansion in industries, population density, anthropogenic activities, and the increased use of automobiles has degraded the air quality in India further. In the last few decades, the greenhouse gas (GHG) emissions and other emissions resulting from anthropogenic activities have increased drastically.

B K Yadav
New Delhi

“ Article by Dr Bhola Ram Gurjar, featuring in Cover Story of Energy Future’s January-March issue is undeniably a thought-provoking text, as it made me informed about the cause and effect of air pollution in the India context. The comparative analysis put forward by the author about death tolls—out of COVID-19 and air pollution—aptly clarifies where do India stands when it comes to air pollution and its associated hazards. Rising urbanization and rapidly expanding industrial sector are the principal factors attributed to continuous degradation of air quality. The air pollution is not just a problem, it has nearly entered into realms of crisis and hence requires national-level immediate attention so that appropriate measures can be developed to curb both its spread and generation.

K. Babar
Jaipur, Rajasthan

“ I always enjoy reading Energy Future because its editions are developed on particular themes. Contents of the last issue were woven around the central theme of air pollution. In the Viewpoint section, in Dr Parikh’s words, how poor air quality is responsible for a country’s poor health status was detailed. The connection between air pollution and waste management was skillfully established, in addition, how prefabrication construction could be an innovative and sustainable option in the building sector to limit pollution levels was aptly explained.

Maya Sharma
Chandigarh

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VJTI TECHNOLOGY BUSINESS INCUBATOR, MUMBAI

CREATING A SUSTAINABLE ECOSYSTEM FOR ENERGY STARTUPS

Energy has played a very vital role in the economic growth of our nation. According to the Ministry of New and Renewable Energy, the Indian renewable energy sector is the fourth fastest growing renewable energy market in the world with more focus on recently evolved areas like electrical vehicles, energy storage, microgrid and smart grid. In the recent years there has been a sharp rise in the number of entrepreneurs and startups focusing on these sectors and the ecosystem including incubators and accelerators along with investors have been positively supporting their entrepreneurial endeavors.

In line with these trends, VJTI Technology Business Incubator (VJTI-TBI) was set up in 2017 at the prestigious Veermata Jijabai Technological Institute (VJTI), Mumbai with the support of Department of Science and Technology, Govt. of India under the NIDHI-TBI Scheme. VJTI (established in 1887 as Victoria Jubilee Technological Institute)

has been a pioneer in imparting engineering education, research and training ecosystem in the country ever since its inception. Considering the expertise, resources and industry collaborations fostered by VJTI over the last few years it decided to create VJTI-TBI, a platform for supporting ambitious entrepreneurs and startups in the country focusing on thematic areas including energy, cleantech, EV, IoT, AI/ML and cyber security of critical infrastructure.

This award-winning incubator (awarded 'Smart Incubator of the Year' at ISGF Innovation Awards 2020) selects startups and entrepreneurs working in the thematic areas through a robust 2-step process by a panel of eminent experts from industry, academia and investment sector. All selected start-ups under the program are provided with co-working space, access to state-of-the-art lab infrastructure (SCADA & Automation Lab, Power Electronics Lab and AI/ML and Embedded Systems

SMDP's i-AC will harness the power of IoT-enabled technology and CoreLogiQ tool to reduce energy consumption in AC by upto 50%



Lab) equipped to test products and prototypes in the domains mentioned above. In addition, VJTI-TBI also provide advisory services in business management, IPR, finance and accounting, legal and technical domains through collaborations with third party service providers and industry associations. Start-ups incubated with the incubator also get access to free tools including AWS credits, ZOHO platform, Zendesk CRM, Solidworks, MatLab and Simulink licenses and MyOperator cloud telephony credits.

VJTI-TBI has also partnered with various corporates (Larsen and Toubro Infotech (LTI), Emerson, NVIDIA, Siemens and CISCO) and industry bodies (India Electrical and Electronics Manufacturers Association, Cyber Peace Foundation, The Institute of Engineering Technology, India Energy Storage Alliance and India Smart Grid Forum) to provide support to the start-ups either through mentoring, funding and infrastructure support (including lab infrastructure). Some of the promising start-ups and entrepreneurs incubated at VJTI-TBI



VJTI-TBI was awarded the Smart Incubator of 2021 by India Smart Grid Forum which was received by Dr. Faruk Kazi (PI & Coordinator)

focusing on energy and cleantech are summarized below:

SMDP Solutions (OPC) Pvt Ltd:

Founded by Vishwesh Bhat, SMDPower Solutions, a Goa-based energy startup, has manufactured innovative IoT-based products that help customers manage their energy consumption leading to significant savings. Their existing range of products include Intelligent Common Light Controller, Intelligent Street Lighting System, Intelligent Temperature Controller and Intelligent Sensrecorder for Electricity.

Winner of the 'Prototyping Grant Award' from Goa State Innovation Council, the startup is currently focused on developing an IoT-based product for making Intelligent Air Conditioners. SMDP believes this product will harness the power of CoreLogiQ analytics software and shall reduce AC power bills by upto 50% giving value to customers.

Contact Person: Mr. Vishwesh Bhat
E-mail: vishwesh@smdp.in
Website: <https://smdp.in>

Torus Robotics Pvt Ltd: Torus Robotics is a Startup India recognized tech start-up working on unmanned ground vehicles (UGV) and robotics. Their flagship technology includes the world's most compact, lightweight and powerful motor technology, which is 50% lighter, 15% more efficient and 10% more cost effective than the commercially imported motors available in the market.



Punaha utilizes a software-controlled 'desulphation process' which can regenerate lead acid batteries to be used twice longer



Torus Robotics has already got recognition for developing an Unmanned Ground Vehicle (UGV) for DRDO and BEML, Govt of India

Their flagship product named 'Kalam' is a multipurpose heavy duty amphibious UGV that shall be used for combat, surveillance and land-based logistics. Torus recently signed an MoU with BEML (formerly Bharat Earth Movers Limited), a Govt of India enterprise. They have also been recognized by national and international organizations including DRDO, Climate Launchpad, UN FLCTD and HexGn.

Contact Person: Mr. Vignesh M
E-mail: taurus.defence@gmail.com
Website:

Punaha Batteries Resurgence Pvt Ltd:

Punaha Batteries is a cleantech startup which aims to reduce e-waste in the battery industry by upto 50% through a novel mechanism to reduce the number of lead acid and nickel cadmium batteries that are discarded. The startup uses a software-controlled 'desulphation' process to regenerate the batteries, allowing them to be used for up to twice as long.

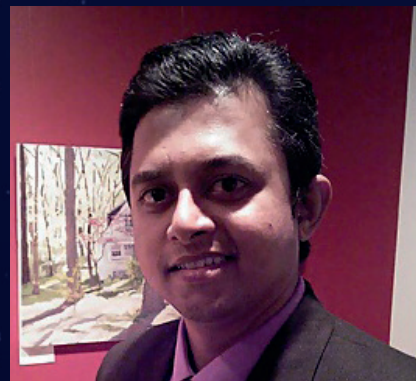
Punaha has provided battery regeneration services to some big names in the industry including Godrej, Asian Paints, Coca Cola, Future Group, Mac Neill Engg, Naval Dockyard Mumbai, Mazagon Docks Ltd and Johnson & Johnson. The startup was selected among the Top 10 innovators under the 'Springwise Positive Innovation Challenge 2019' organized by Springwise Intelligence (UK) in collaboration with Startup India.

Contact Person: Ex-CDR Harihara Subrahmaniam
E-mail: hari@punahabattery.com

Website: <https://punahabattery.com>

VJTI-TBI is currently looking to partner with industries and businesses focusing on developing innovations in the energy and cleantech domain for promoting innovation challenges and hackathons. The incubator has already forged partnerships with LTI, ITD Cementation India, SIDBI Capital Ventures and Technotalent Engineering India and raised CSR funding of upto Rs 187 Lakhs for providing seed support to startups and for creating co-working space and prototyping labs. Partnerships with these stakeholders in the relevant domains plays a key role to help the entrepreneurs tide the difficult part of the journey in their initial years. The incubator also plans to onboard between 10-15 startups working in the thematic areas of energy, cleantech, AI/ML, IoT, EV and cybersecurity.

*Author: Dr. Roshan Yedery
Chief Executive Officer
VJTI Technology Business Incubator*



Author: Dr. Roshan Yedery, Chief Executive Officer, VJTI-TBI

RENEWABLE ENERGY AT A GLANCE

Programme/Scheme wise Physical Progress in 2020-21 & Cumulative upto Aug, 2021			
Sector	FY 2020-21		Cumulative Achievements (as on 31.08.2021)
	Cumulative Achievements (as on 31.03.2021)	Achievements (Apr-Aug 2021)	
I. Installed RE Capacity (CAPACITIES IN MW)			
Wind Power	39247.05	444.10	39691.15
Solar Power - Ground Mounted	35645.63	3168.86	38814.49
Solar Power - Roof Top	4439.74	1046.54	5486.28
SPV Systems (Off-grid)	1150.66	160.46	1311.14
Small Hydro Power	4786.81	21.00	4807.81
Biomass (Bagasse) Cogeneration	9373.87	25.00	9398.56
Biomass (non-bagasse) Cogeneration)/Captive Power	772.05	0.00	772.05
Waste to Power	168.64	0.00	168.64
Waste to Energy (off-grid)	218.95	14.24	233.20
Total	95803.40	4880.20	100683.32

Source: <https://mnre.gov.in/the-ministry/physical-progress>

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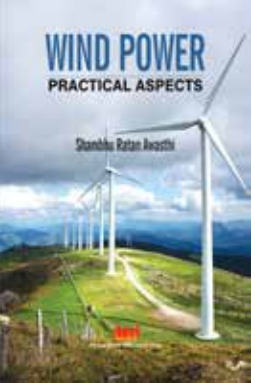
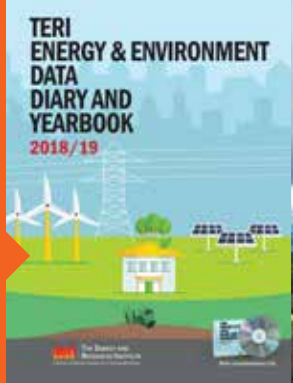
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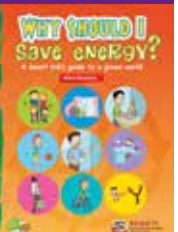
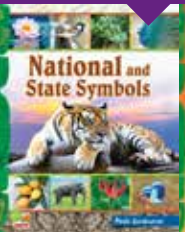
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