Access to Energy

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EDITORIAL

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Financing for energy efficiency in MSMEs

A large fraction of India's firms are small, informal and operate in the unorganised sector. Recent annual reports on Micro, Small and Medium Enterprises (MSMEs) indicate that the sector contributes to around 30% of India's GDP, and based on conservative estimates, employs around 50% of industrial workers. Over 97% of MSMEs can be classified as micro firms (with an investment in plant and machinery less than INR 2.5 million), and 94% are unregistered with the government. A large number of MSMEs are characterized by usage of old & low efficiency technologies that result in large energy loss and reduced profitability. Owing to the geographical spread and operational and managerial complexity of the MSME sector, the issues such as inefficient equipment and other operations related problems are yet to be addressed in a comprehensive manner. Technology upgradation programmes supported by GEF, BEE, UNIDO, World Bank have been launched to achieve energy efficiency in eligible MSME enterprises. The Ministry of MSME through state agencies have made available funds for technology upgradation. However, the offtake of the schemes has been limited due to procedural issues for claiming these funds.

One of the key factors adversely affecting the adoption of energy efficient technologies among MSMEs is considered to be their inability to access institutional finance. Despite Government's efforts, the percentage of MSMEs taking advantage of institutional finance is small. MSMEs prefer to either self-finance renovation and modernization or borrow from informal financing channels. ESCOs form a very small part of financing EE projects in MSMEs.

MSMEs are facing challenges on several fronts: cash flow, limited knowledge and awareness on EE, high first cost for incorporating EE measures etc. The government has initiated several measures that will help improve the cash flow situation in MSMEs. However, a large gap exists in meeting the needs of MSMEs for financing. Due to their dependence on the cash-economy that is severely hit by the pandemic lockdown, the operations of the MSMEs will be severely impacted. This will have substantial impact throughout the economy and therefore, a robust policy response is essential.

Unlock the Potential for Grid-Connected Solar Power through Private Sector Investment, Sierra Leone

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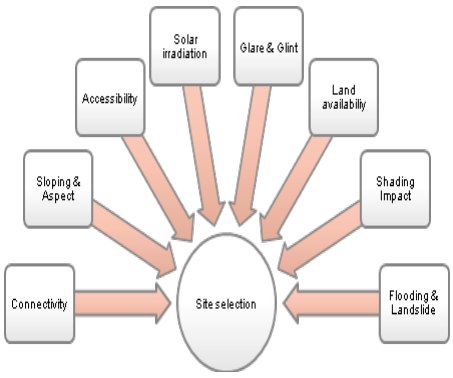
The aim of this assignment was to facilitate private-sector investment in grid-connected solar PV power plants in Sierra Leone. ITPEnergised role focused on the identification and prioritisation of specific PV projects based on a least cost principle.

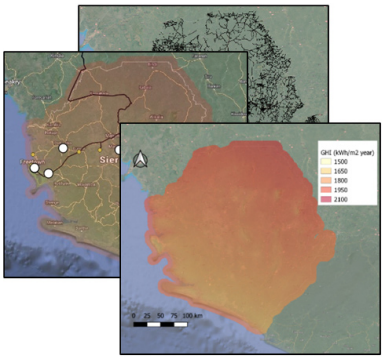
The energy context in Sierra Leone shows that about 160 MW of the country generation capacity is supplied by the Bumbuna I 50 MW hydro power plant and the 30 MW HFO barge Karpowership. Nevertheless, during the drier season months the actual electricity production for Bumbuna goes as low as to 7-15 MW. Consequently, actions were investigated to improve the current situation with the potential addition of solar power capacity to compensate the lower production of the hydro during the drier months.

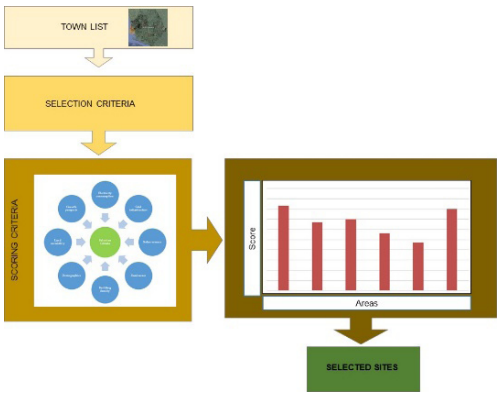
The proposed PV plants were based on a "least cost principle" so that the future expansion plan for connecting the selected candidate solar plant units to the current and future grid development would be at least cost. ITP Energised evaluated and selected sites based on a multiple basis criterion (see Figure below).



The optimal location of a solar power plant was based on a variety of factors, which included amongst others solar resource potential, slope & aspect, energy demand, availability of grid infrastructure, suitable land features, road access networks for logistical and operational reasons, etc. Based on this information as well as considering government targets, project constraints, planned CLSG interconnector etc. a set of prioritisation criteria with corresponding weighting factors was developed ranking a solar project pipeline.

A GIS model was created with software QGIS to support the solar site identification process. ITPEnergised identified a total of 7 sites with a cumulative solar PV capacity 60 MWp with an installation process that would start in 2020 and be completed by the end of 2021. The power ratingsfor the grid connected proposed PV plants would range from 1 MWp to 30 MWp. The modelling, sizing and energy yield were undertaken with the PVSyst software where an annual energy output of 91.6 GWh was estimated. The hourly solar penetration of the 60 MWp would range between 0 and 30% and would represent 11% of the total energy demand forecasted by 2021.





District cooling : Enabling Large Scale Integration of Renewable into the Grid

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Increase in global mean temperatures and improvement in living standards in the global south will lead to an increase in cooling demand in the near-future. The use of vapour compression based air-conditioners could lead to an increase in electricity demand and GHG emissions, if the electricity is generated through fossil fuel resources. India has one of the largest number of heating days in the world. Approximately, 40%-60% of India's peak electricity demand is due to the use of air-conditioning equipment in residential and commercial buildings. The peak-demand hours have shifted to late evening during the summer months. New power plants running on fossil fuel will be needed to meet the increasing peak loads in the future, as the solar generators are not available during night hours. California faced a similar situation and the condition is referred to as duck curve.

India has an ambitious goal of integrating 175 GW of renewable energy generators in the electricity mix by 2022. As renewable energy generators are intermittent, their integration in the electricity grid would require the electricity grid to be more flexible. Flexibility of the grid could be improved by integrating grid-scale storage systems. Until now, the discussions around electricity storage have been centered around pumped hydro storage and electrical batteries in India. However, district cooling systems with thermal storage tanks could be a cheaper alternative for Indian conditions as a major proportion of electricity is consumed for cooling applications in India.

District cooling systems (DCS) are similar to district heating systems, where a centralized cooling unit produces chilled water, which is circulated to the buildings through underground insulated pipelines connected to the consumers. The chilled water is circulated in a closed loop and is circulated back to the cooling unit. The chilled water could be stored inside insulated tanks to shift the peak demand to sun hours, when electricity from renewable energy sources are available. DCS could offer multiple advantages over traditional individual cooling units. It frees up space in the commercial buildings, allowing for more revenue generation. Renewable energy generators like solar and wind can be more easily integrated to the DCS and can provide demand response facilities to the electricity grid. Sources of free cooling like river water could be used to further decrease the energy consumption. The pharmaceutical industries located near the banks of the river Ganges in Uttrakhand could use the cold water from the river to reduce their cooling loads through a district cooling system. While thermally driven cooling systems are not very efficient at smaller sizes, they could be used as an alternative to compression based cooling systems in DCS. A vapor absorption based DCS has been operational in DLF cybercity in Gurgaon and runs on waste heat from the natural gas turbines used for electricity generation. The project received carbon-financing under the clean development mechanism. Industrial waste heat or solar thermal energy could be used to power vapor absorption or vapor-adsorption based cooling systems. Excess cold from the LNG plants could also be used in the DCS. While individual air-conditioning plants are constrained for space, DCS components could be designed for improved efficiency and the higher capital costs could be shared by multiple consumers.

The operation and business plan for DCS could be designed similar to the district heating systems (DHS) operational in many European countries. In Denmark, more than 65% of the heat demand is met through DHS. Majority of the DHS companies are owned by the consumers and are not-for-profit. A similar approach could be followed in India to make the system more transparent. In the initial stages the DCS would need to be subsidized by the government. Enabling policies and certainty in policy measures would allow further investment in DCS from companies engaged in building and operating DCS in other countries. DCS could become the backbone for India's energy transition and could play an important role in improving the energy security of the country.

The article above is an invited guest article

The Lockdown and its Impact on the Renewable Energy Sector

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Novel Coronavirus or Coronavirus disease (COVID-19) has left the streets from bustling to deserted as millions confine themselves to their homes. According to the World Health Organisation, there are no specific vaccines or treatments for COVID-19 yet, which has led many countries resorting to a nationwide quarantine and social distancing in an effort to contain the virus and control the spread. More than 70 countries (as on 31.03.2020) including India have gone under national lockdown. There is no doubt that the lockdown will gravely affect the global economy. However, there have been discussions going around the world on how to handle the situation well and prepare for the risks that lie ahead. The Renewable Energy (RE) sector will also face the impact with delays in project implementation and deferral of National RE target timelines. According to International Renewable Energy Agency (IRENA), global renewable energy capacity stood at 2,537 gigawatts (GW) on December 2019, an increase of 176 GW compared to 2018, but the coronavirus disease will however continue to cast a shadow over the sector's prospects for 2020, impacting both supply chains and manufacturing facilities.

This article presents consolidated views of RE experts in India on the impact of Covid-19 on RE sector. The views have been collected from various panel discussions conducted through recent webinars, by Bridge to India, Clean Energy Access Network (CLEAN India), Earnst & Young (India), World Wildlife Fund (WWF India), on the theme "Coronavirus and its impact on the RE sector in India". India went under 21 days lockdown on March 24th, 2020, which has now been extended further till May 3rd, 2020.

As on 2019, India has commissioned 5,602 megawatts (MW) rooftop solar, 31,504 MW utility scale solar and 37,289 MW of wind projects. Also, there is a huge pipeline of projects in construction and bidding stages which includes 28,843 MW of utility scale solar and 9,237 MW of wind power projects and their future is uncertain at this point of time. The Ministry of New and Renewable Energy (MNRE), Government of India has made few announcements to mitigate the impacts on RE sector. As per a notification issued by MNRE, the Renewable Energy Generating Stations have been granted 'must-run' status during lockdown period and has also directed the power Distribution Companies (DISCOMs) not to curtail RE power. Another notification issued by MNRE has allowed time extension in scheduled commissioning date of RE projects considering disruption of the supply chains due to spread of coronavirus in China or any other country as Force Majeure (FM) event. However, suitable extension of time will only be given to the project developers if they are able to produce the supporting evidence to their claims to such disruption of supply chain. Power generation being an essential service will include all the RE projects that are already operating and shall have free flow of workforce and materials for smooth operation. In addition to these, the Reserve Bank of India (RBI) has further announced a three-month moratorium on debt repayments to reduce the financial strain on the borrowers. RBI further said that working capital norms will be relaxed for various borrowers.

With industries shutting down their operations amid lockdown, the DISCOMs are under financial strain as power demand has reduced by 20-25%. However, the Ministry of Power has announced to provide a moratorium period to DISCOMs for making payments to electricity generating companies, in the wake of the global crisis.

Most of the Indian module manufacturers import the PV equipment (raw materials, modules, Balance of Systems) from China and usually build up inventories in advance before the Chinese New Year since no export from China during December to February. The onset of the Covid-19 coincided with the Chinese festival (late January 2020) and thus

the supply chain got disrupted when the epidemic spread widely in China. However, the manufacturers were in a state to manage with the surplus in the inventory till February. However, they are facing a challenge with limited quantity of material. There are projects to be installed, but there is lack of material. Furthermore, the lockdown has completely shut the production in India and cashflow is adversely affected. The per kilowatt (kW) cost of a PV module has increased by 5%. The government support and community cooperation are what is keeping things working so far, solar EPCs believe that times are uncertain and road to recovery will not be easy. They foresee the cascading effects to go on till September.

When the lockdown will end, experts believe that there would be reluctance with people to come back with a full force. There would be a lot of pressure on the supply chain which will take some time to stabilize. However, viewing from an optimistic angle, the lockdown has given digital economy a boost. It has brought the pollution down significantly- the air is cleaner and so are the water bodies. The lockdown has further given us enough time to assess the world around us and appreciate the advanced technology. Nevertheless, we must strive on and plan conscientiously for what lies ahead in our lives.

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