

Proposal for Energy Social Responsibility

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Abstract: The paper significantly works upon, how as per the newly implemented mandate under 'The Companies Act, 2013' organizations in India having turnover >100 cr & >200 cr (PAN India) or having net profit of at least 5 Crore have to spend 2 percent of their profit as part of CSR Corporate Social Responsibility to carry a philanthropic activity. As a social responsibility towards environment sustainability, India needs to change to renewable sources of energy which are non-polluting which will also support increasing demand for power and electricity. For economic as well as environmental rationales, this paper tries to recommend ESR (Energy Sustainability Responsibility) that can be accumulated through monetary support by all of the BSE (Bombay Stock Exchange) and NSE (National Stock Exchange) companies that in contrast can be accommodated on the research and development as well as infrastructural development of non-conventional and renewable sources of energy. The proposal can support India as well as countries across time zones to save fossil fuel reserves for future and create sustainability of these reserves. For the same objective the paper is addressing the applicability of ESR for setting up projects for renewable source of energy and cost involved in setting up of these projects vis-a-vis the efficient use of funds accumulated by the target companies by way of ESR: Energy Social Responsibility. The research design used is both descriptive and exploratory.

Keywords: *Solar Energy, Energy Social Responsibility, Energy Sustainability, Energy in India, BSE and NSE Companies, Renewable Sources of Energy*

1. Introduction

Fossil fuels play a very important role in administering the economy efficiently and enforcing newer developments effectively. Oil & gas, Coal and other mineral resources supports us with most of our energy mix and touch our lives in multiple dimensions. They cater to everything - from domestic uses to manufacturing industries and from transportation fuel for synthesis of organic and chemical products. India is a country with more than 1.3 billion people accounting for more than 17.5% of world's population (Census of India). In the past ten years, it has seen an amplified growth of energy demand with confronting scarcity of energy resources. India's economic growth has increased by 7-8% every year and is speculated to grow with the same momentum in the coming years (Asian Development Bank). This stresses the need of exploring avenues for meeting the energy requirement which fuels growth even to further extend. India's population and economic growth have led India to be the third largest importer of energy (India Energy Outlook, IEA 2015). The nation faces challenges with balancing the demand and supply of energy which leads to the often seen shortage or 'power cuts'. In the last decade, accessibility to power in India has both improved and enhanced but demand has over and over again outstripped supply and considerable energy peak shortages have prevailed. The statement of the problem does not conclude here. Maintaining environmental sustainability is a concern for the entire world and India is no exception. Since burning of fossil fuels is one of the most significant reasons for climate change and global warming, it becomes very much essential for countries across the globe to switch towards green energy. In the last few years there have been prodigious efforts, both at global level as well as in India, to encourage industries to move towards sustainable business models (CII, 2013). This proposal for Energy Social Responsibility details the model wherein the energy users can support sustainability of energy with the government.

What is ESR? Energy Social Responsibility is expansion of new energy infrastructure which entails the nation to tackle quite a few key challenges. These include: (a) increasing concern of energy security at a time of

rising global resource scarcity; (b) supporting large energy infrastructure with sizable investment disbursements; (c) increasing development in the interweaved maintenance infrastructure; (d) reducing societal and ecological influences of developing energy infrastructure; and (e) addressing climate change impacts, adaptation and mitigation. Effectively dealing with these energy-related challenges will oblige changes in the country's socio-economic and institutional structures. Consequently, a new directive under the Public Private Partnership that can convey influx of monetary reserves accumulated from the enormous companies under the policy of societal accountability for environment sustainability is what we suggest.

ESR or Energy Social Responsibility refers to contentions that needs to be followed by the community towards Energy Sustainability as their primary duty. So the model proposed is funds under the mandate can be accumulated through all of the BSE (Bombay Stock Exchange) and NSE (National Stock Exchange) companies. The ESR can be accommodated in the research and development of non-conventional and renewable sources of energy that can aid the country as well as the world to save fossil fuel reserves for future and create sustainability of these reserves. The ESR or Energy Social Responsibility will address the global energy sustainability crises in different stage. In the first stage ESR will help to use the 1% ESR monetary fund to build solar power plants and gradually replace the burden of power production using fossil fuel to production of energy by the power houses through renewable sources. Hence, making solar energy lucrative and attractive in the country is the proposed agenda for stage I.

Why Energy Social Responsibility? There is a mandate under the Companies Act, 2013 wherein 2% CSR or Corporate Social Responsibility has to be contributed by firms with profit or turnover over a certain amount. This is to ascertain that Indian businesses take on the crucial responsibility of leading the backward society of India from the front and support government funds for the nourishment of the people. However, we propose of Energy Social Responsibility to develop the trajectory of renewable sources of energy in India. Energy is vital for growth, but the current energy state is not adequate for development we aim for. India is the third largest importer of energy resources (IEA, 2015) and this itself emphasizes the need to develop internal sources of energy that will go for the long run. There is a great disproportion in the energy use amongst different regions of the world and even for countries like India, where the rural areas are grieving of the assistances of energy. India needs to channel this gap at the earliest and this is of key importance for any development which should embrace all the sections of society. The above, along with the concern of environmental disintegration through the usage of conventional and non-renewable resources needs a paradigm transitional change towards the usage of renewable sources in a bigger picture. To establish the infrastructure and operation of these renewable energy power plants, both the public and private sector are required to advance together in the lieu of achieving it. The Energy Social Responsibility interim stage can make a difference and help India as a nation to cover for its lack of energy resources through the usage of solar energy to generate power.

Framework of ESR: The BSE and NSE listed companies in the first stage as proposed would contribute 1% of their profits to the government ESR funds. Unlike the taxation in India, the proposed model is aggressive and not regressive. The government under the Public Private Partnership model would monitor the accumulation and implementation of the projects, while the private companies (selected through an open and transparent procurement system) would be assigned to undertake construction and management of the infrastructure and operations. These funds would largely be used for developing alternative sources of energy security, namely only the renewable ones and on research and development of the same. Hence the role of the fund shall be centralized around escalating current alternative energy development projects and developing and deploying large scale distributed energy sources including solar, wind, hydro, biomass, and geothermal for power to reach to the populous. The aim of the Phase I would be developing 100 million solar roofs and deploying large scale solar generation through developing a solar farm and a grid channel in the next five years. This would stimulate electricity in the rural areas or fuel industries with triggering the wave of green energy. A partial amount can also be routed towards developing R&D facilities within academia and other institutions to develop innovative and better integrated solutions with respect to green energy. The idea aims to transform India into a global solar manufacturing hub and accelerate the use of solar energy country wide.

Emphasis on Solar in Phase I: India's majority region is blessed with sunshine for more than 10 hours a day for average 300 days (Natural Resources Defense Council, 2012) and this implies that amongst several

renewable sources, solar energy potential is India's key strength. India can build up on the same specifically in its remote and rural areas where there is no or limited availability of electricity. Even if country's barren lands and deserts can be transformed to generate power from solar energy, it could mark the beginning of the end of India's problem where around 300 million of its people have no reliable access to electricity (IEA, 2013). Developing solar manufacturing shall also enhance job opportunities in India. On the application side, commercializing solar will not only reduce India's dependency on fuel imports but make industries self-reliable to develop with a higher growth with no limitation to use of energy which is green.

2. Analysis and Interpretation

Cost of Setting Solar Power Plant: As per the order of CERC (Central Electricity Regulatory Commission) the normative capital cost of setting up Solar Photovoltaic Power Project was INR 1700Lakh/MW or INR 17.00 crore/MW for FY-2009-10. However as per the order published during September 2010 the normative capital cost of setting up Solar Photovoltaic Power Project was reviewed and finalized to be INR 1442Lakh/MW or INR14.42 crores/MW for FY-2011-12. This clearly signifies a reduction of INR 258Lakh/MW for setting up a Solar PV project within a span of two years (CERC report 2009, 2010).

Contribution from ESR: Under the proposed ESR model every BSE and NSE listed company pays 1% of their net profit as ESR. It will create huge amount of cash flow under which the money accumulated by ESR can be used for setting renewable energy power generating plants. Just to have an idea about the amount of fund that can be generated we have taken 500 top performing companies of BSE (Bombay Stock Exchange) and top 50 companies of NSE (National Stock Exchange). The companies' profits during the last decade i.e. starting from 2005 to 2015 were gathered and assessed to estimate the prospective ESR amount that can be accumulated. The Average Total Profit generated by all the selected companies is shown in table below:

Table 1: Profits for Companies

Listed Exchange	Number of Companies	Average Total Profit (in INR Crore)	ESR Contribution (1% of Net Profit in INR Crore)
BSE	474	26,41,701.86	26417.02
NSE	50	15,78,705.76	15787.06

(Source: Ace Equity and Author's calculation)

In the last 10 years BSE 474 companies' contribution at 1% to ESR could had been around INR 26417.02 Crore and the same for NSE 50 companies' contribution at 1% in ESR is around INR 15787.06 Crore. This contribution as proposed, gets accumulated on yearly base by some regulatory body under the GOI (Government of India) under the PPP model (Private Public Partnership) for monitoring project implementation while the operations are undertaken by some private organization or firm.

Utilization of ESR Contribution: As per the order of CERC (Central Electricity Regulatory Commission) the normative capital cost for setting up Solar Photovoltaic Power Project was INR 1700Lakh/MW or INR 17.00 crore/MW for FY-2009-10. However as per the order published during September 2010 the normative capital cost for setting up Solar Photovoltaic Power Project was reviewed and finalized to be INR 1442Lakh/MW or INR14.42 crores/MW for FY-2011-12. For sake of estimation we will calculate taking both cost that is 17 Cr/MW and 14.42 Cr/MW. We calculate the quant of power that can be generated in the plant with the ESR funds under both the scenarios.

Table 2: Estimated Costs

Stock Exchange	Contribution	Cost 1 (17 Cr/MW) Estimated Production Capacity Generated	Cost 2 (14.42 Cr/MW) Estimated Production Capacity Generated
BSE (500)	26417.02	1553.94 MW	1831.97 MW
NSE (50)	15787.06	928.56 MW	1094.80 MW

(Source: Author's Calculation)

Electricity that can be generated from the solar power plants is around 1831.97 MW and 1094.08 MW which is quite remarkable to note. This much power is adequate to run a metro city and help to replace a large mass of production of power produced through using the fossil fuel coal in thermal power. It will also help us to conserve fossil fuel for our future generations. The amount of coal used to generate fuel equal to 1 kilowatt (kW) is 0.00052 short tons or 1.05 pounds. If we produce power by solar energy, we can save importing quality coal which is used to generate electricity in the thermal power plant. The amount of natural gas and petroleum fuel utilized to generate 1 KW of power equals to 0.01010 Mcf or 1,000 cubic feet and to 0.00175 barrels (or 0.07 gallons) respectively.

Table 3: Non-Renewable energy to be saved

Scenario	Estimated Production Capacity Generated MW	Estimated Production Capacity Generated in KW	Coal Saved (1.05 Pounds/KW)	Natural Gas Saved (1000 Cubic feet)	Petroleum Saved (0.07 gallons)
1	2482.50 MW	2482500 KW	2606625 Pound	2482500000 Cubic feet	173775 Gallons
2	2926.77 MW	2926770 KW	3073108.5 Pound	2926770000 Cubic feet	204873.9 Gallons

(Source: Author's calculation)

Now that every 1KW electricity we produce by solar energy can alternatively save consumption of coal by 1.05 pounds, natural gas by 1000 cf and petroleum by 0.07 gallons, the above calculations suggests how much quantity of these conventional fuels can be saved if we produce the electricity by the solar power plant. All of this is achievable only by the contribution of 1% from the BSE & NSE top 500 and 50 performing companies' respectively. These figures would considerably change if we consider all of the companies listed and those unlisted but are financially playing a major role in driving the country's economy.

3. Challenges

India stands 21st amongst the world's most densely populated countries (World Bank Database, 2011-2015). This suggests of the scarcity of land with respect to the high population in the country. The amount of land required for utility scale solar power plants currently approximately 1km² for every 20 to 60 megawatts (MW) generated could pose a strain on India's available land resource (Srivastava and Srivastava, 2013). Exclusive installation of solar panels would cost other necessities that require land. And hence here the Roof Top Policy i.e. individual rooftop power generation systems connected through the local grid system can play a transcending role and would be the most suitable solar architecture in India. Another challenge in meeting the solar end is the cost to develop solar farms and photovoltaic cells. Building individual rooftop power generation systems is not viable for the majority of the residents of the country. Developing the same with sovereign money will not relish the economies of scale for the nation. And hence it requires a drop in the price of the panels and photovoltaic cells so that it interests individual domestic households. Moreover, developing ESR and utilizing it for developing alternative energy sources will take much time to progress. Its results would take even more time to reflect. But surely the potential of the proposal with government and corporate/industrial support be beneficial to the country in the long run.

4. Future Scope

Rural Electrification has been a challenge for India, which can be overcome with the development of solar resources through ESR. Several research bodies in India and across time zones believe that sunny tropical areas which are densely populated such as India should adopt building on their solar energy assets and serve to large masses of potential consumer. This shall ensure no compromise on economic growth with reining on its long-term carbon emissions and backing long term energy requirements. Contributions from all the stakeholders - corporate, industries, masses and government can only make this sketch practicable. The stage II of the proposed ESR mandate can have establishing wind plants and tidal plants with the monetary fund's accumulated than. On a wider perspective, developing and developed countries can adopt the mandate in

accordance to their structures and laws and abide the ESR which will help expand renewable sources of energy and make this world greener and sustainable for the future generations.

5. Conclusion

Energy is important in achieving the unified development - economic, social, and environmental; sustainably. But if India is to realize this significant objective, the kinds of energy India is producing and the ways it uses them will have to be changed. Else, harm to the environment will impede the economic growth. It is highly required that India looks more and more towards renewable energy for attaining energy security by 2050. India's current target of developing around 15.9% of total energy from renewable sources by 2022 is too modest (Garg, 2012). We surely can't restrict the demand for energy for it will steadily rise from increased output or activity directly; stress needs to be put on conservation measures at the early stage of development. Solar and wind energy can turn to be the intelligent options for India's economic future. If India made the massive switch from coal, oil, natural gas and nuclear power plants to renewable energy, it is possible that 70 percent of India's electricity and 35 percent of its total energy could be powered by renewable resources by 2030 (Goswami, 2013). This would ensure that there are no technological or economic barriers to supplying and catering to India's energy demand through the use of a clean form of energy formed from solar, wind, hydro and biogas by 2050. It's time that India puts more focus on renewable energy and implementing Energy Social Responsibility can just be the right way. There have been lots of developments in India when it comes to developing alternative energy and a lot more developments can still be integrated. With the low in oil prices, financially there is a lack of incentive for investors however investments in renewable sources not only promise a sustainable future but also an economic profitable future outlook. Newly built solar plants produce considerably cheaper energy than electricity produced from fossil fuels if calculated in the long run. It is the time when we make fossil energy a thing of past and embrace the renewable energy future now.

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