

**International Conference on Renewable Energy
Resource & Management – The Ultimate Source of
Survival**

Theme: Business Finance and Asset Management Strategy

**Responsible Financing for
globalization of Renewal Energy**

Presented by

Mr. Sameer Joshi

B.E., MBA

Vice President, Rail Electrification

Siemens AG, Germany

Pursuing Ph.D. at Welingkar Institute of Management Development and Research under the guidance of Dr. S. Gondhalekar, University of Mumbai

Email: sameerjoshi.research@googlemail.com

Mr. Navin Mukesh Punjabi

Assistant Professor

H R College of Commerce & Economics

BMS, M Com, PGDBA, UGC NET (JRF)

Pursuing Ph.D under the guidance of Prof. Dr. P.S. Rao, University of Mumbai

Residence: 249, Kirpa Niwas, 1st Floor Sion East, Near Premier High School, Mumbai 400022

Mobile: +91 9920177199 Residence: +91 022 24094345

E-mail: navin.punjabi@gmail.com

Office: H R College of Commerce and Economics. 123, Dinshaw Wachha Road, Churchgate Mumbai 400020 Tel: +91 022 22876115 / 22042195

Research Assistant- Abhimanyu Kasliwal, Third Year- Bachelors of Commerce (specialising in Financial Markets), H R College of Commerce and Economics

Abstract

It is universally acknowledged that the Indian economy has been on the path of accelerated growth since the past two decades. Having grown at a CAGR of 6.2% since 1991, and crossing 8% growth in the past 5 years, India is once again set to become the world's "golden bird". However, as it inches towards becoming the 3rd largest economy, with its abundant mineral resources and its young and highly educated populace (at the least in absolute numbers), there is only one barrier on its road to prosperity- a massive shortage of energy.

India is currently the world's fifth largest oil importer, meeting 75% of its needs from overseas. According to the International Energy Agency, India is poised to become the third largest importer (after US and China) by 2025. While India accounts for 5% of the world's energy consumption, known hydrocarbons in the country are only 0.5% of global reserves. Clearly, India will always be a net importer, unless there is a miraculous discovery.

To be dependent on a resource that has to be imported from unstable nations like Iran and Nigeria, is not only detrimental to the Indian economy (with oil currently being at US\$ 125 a barrel, and rising), but to the entire global political structure. And to this, there is only one solution- a source of energy that is cheap (in the long run) and limitless- renewable energy- with an estimated capacity of 152,000 MW.

This paper attempts to describe the globalization of renewable energy- and more importantly, how such projects will receive financing. The paper also attempts to study which sources of finance (including venture capital, private equity and project finance) is preferable by companies in the renewable energy space. The paper aims to elaborate on 'Responsible Financing' by banks, based on the 'Equator Principles'- where banks are expected to give lend preferentially to those projects which are environmentally and socially sustainable.

Key Words: Responsible Financing, Equators Principle, Sustainability, Renewable Energy and Globalization of Renewable Energy.

Introduction:

"New and renewable energy sources are energy sources including solar energy, geothermal energy, wind power, hydropower, ocean energy (thermal gradient, wave power and tidal power), biomass, draught animal power, fuelwood, peat, oil shale and tar sands. Renewable energy is energy obtained from sources that are essentially inexhaustible (unlike, for example the fossil fuels, of which there is a finite supply)." - UN Glossary of Environment Statistics F-67E

Renewable energy has become the buzzword internationally since the past two decades. It has also begun to generate interest in the minds of the powers-that-be in India. That is not to say that it has not been popular or preferred in the past- hydroelectric projects have been implemented in India even prior to independence such as for eg. Tata's Bhira Hydroelectric Power Project built in early 1900's and immediately after independence. Names such as Bhakra-Nangal come into mind, which had begun to be set up in 1955, and which has a combined power generation capacity of 1355 megawatts.

But renewable energy was preferred in the past because it has no recurring fuel costs, and was thus truly self-dependant. Today, however, renewable energy is preferred for another reason- because it is clean, atmospherically non-polluting and does not have the availability limitation of fossil fuel.

India currently has an installed capacity in power generation of 171,900 MW. Roughly 65% of this is non renewable thermal power- power plants fed by coal, oil and natural gas. Most of the fuel for this is imported, as India consumes 340 million tons of coal annually- but Indian coal has a very high ash content (India has almost no anthracite reserves, and mainly lignite deposits), and is thus unsuitable before further cleansing and purification. Also, India does not have much in the way of oil and natural gas reserves (even keeping the recent discoveries in the Krishna-Godavari basin in mind). This increases supply risk- risk not only of crude oil prices rising, but also the risk that arises due to the fact that almost all oil exporting countries have unstable or dictatorial regimes (India imports 61% of its oil from Saudi Arabia, Iran, Nigeria and Iraq). The end result is that India's annual fuel import expense is over ` 3 trillion, almost a third of which is subsidised for the final consumer. India's fuel subsidy bill is estimated to cross \$ 32 billion in 2012. Non-renewable energy is just not good for the economy.

There is also the matter of thermal power being extremely polluting. This is not just because of the billions of tons of noxious gases released during extraction and use of fossil fuels (mainly carcinogenic sulphur dioxide and nitrogen dioxide, thus making the air unbreathable within the vicinity of even 10kms of the plant), but in case of coal, also the burnt out and noxious fuel residue. Burnt coal and fly ash does not have 100% reusability- even in industrialised nations like Germany, only 80% fly ash is re-used. But in India, only 3% fly ash is recycled- the rest is dumped in the countryside. 90 million tonnes of fly ash is dumped every year. Also, thermal power generation requires a very large amount of water, and leads to thermal pollution, rise in temperature of the surroundings of the power plant, and serious danger to the existence of local wildlife.

Hydroelectricity is a better alternative to thermal power- it is cheaper, once fixed costs have been recovered. It does not pollute the air. But it leads to human displacement and loss of land for the farmers who unfortunately have farmland where reservoirs have to be constructed. And it causes land degradation and soil erosion, especially around the reservoir. There is also the fact that the initial investment to set up a hydroelectric project is very high. It also requires a large amount of planning and technical skill to set up and run a hydroelectric project. Finally, the hydroelectric capacity of most large rivers (which have the requisite water flow power) has mostly already been tapped.

With the sun, wind, oceans and other similar sources, our power shortage problems can be easily and completely resolved through renewable energy.

Many people think of solar energy as the main future energy source. Throughout human history, the sun has been used to give light and heat. But the sun's almost unlimited potential can provide enough electricity for the whole planet. Different methods have been used to harness energy from sun, and the simplest method is through the use of a photovoltaic cells. Photovoltaic cells contain a special technology that traps the sun's energy and converts it into electricity. As most of India is between the equator and the latitude 30°N, it receives an abundant amount of sunshine throughout the year, except the monsoons, when sunlight is diffused but still adequately strong.

Wind power is also one renewable energy sector in the rise, especially in some European countries

like Denmark and Germany. Basically wind power uses the same principle found in hydroelectric dams to convert the wind kinetic energy to electricity. There are lots of windy areas across the globe, and in many parts of the world people are trying to harness wind energy as much as possible, though efficiency of this energy source still remains a big problem, largely because of inconsistency of wind blowing. In India, the government and the private sector (with large companies such as Suzlon) has profitably set up around 13 Gigawatts of wind power installations.

There is also tidal power and biomass power. It is not very hard to conclude that if science and technology continue their development, renewable energy systems could be more than sufficient to satisfy world energy demand in years to come. If this happens this will have very positive effect by eliminating our dependence on fossil fuels, which has been blamed as the main factor contributing to climate change problem.

Solar power has the potential to become one of the most cost-effective renewable energy sources- with a little fixed cost investment on solar panels and generators needed to really make the difference. Solar panels that are created nowadays, can be very easily adapted and integrated with the architectural design of modern-day homes and office buildings. The negative factors are high installation costs (that are still more expensive than simply buying power from utility companies), but the benefits can soon recover the marginally higher initial investment. Wind power is risky, as there are numerous factors besides the high initial investment and sustained maintenance required- climate change to begin with. Wind has become stronger in some areas, and virtually non-existent in others where it was forceful. But while the winds may shift to other areas, the sun is not going to stop shining. Obviously, solar power is the future.

It has been established beyond doubt, that the world has no choice but to turn to renewable energy, in order to fuel the growth of civilisation and the human race. In fact, renewable energy can be the intertwining factor that brings the nations of the world closer and on a more equal footing- as it is very obvious that the regions between the Tropics of Cancer and Capricorn are the nations in the torrid zone, that receive the maximum sunlight. Historically, some of these have also been the most economically downtrodden and backward. But through the forces of economic and technological globalisation, the nations of the world can be brought to an equal footing. Power harnessed in the equatorial nations can be transmitted globally through cables, and sold to countries that need it. We are close to an era where power shortage will be unheard of. The only limiting factor is the long distance power transmission capacity of cables, which currently stands at 1700 kms (the Inga-Shaba high voltage D.C. power transmission line, in the Congo). As technology evolves further, and transmission wires with lower resistance (and thus lower power leakage losses) are manufactured, power will soon be transmitted from the Australian outback to Canada. Also, renewable energy is unlimited and requires no fuel- thus, countries will not be able to cartelise and earn monopoly profits; as a country will just produce power itself if other countries are charging it too much (unlike the case of oil, wherein OPEC has arbitrarily been able to control and raise prices on a sustained basis, as it currently has monopoly control on the limited world oil supplies). Power will only be exported by and purchased from countries which have a competitive advantage in the production and transmission of renewable power.

So now the most important question needs to be addressed- renewable energy can be produced by the private sector, the public sector, or both in collaboration. But how can it be financed? Financing has traditionally been looked after by government and government aided institutions.

In India, major policy initiatives are being taken by the Central government to encourage private/foreign direct investment in tapping energy from renewable energy sources- including provision of fiscal and financial incentives under a wide range of programmes being implemented by the Ministry and simplification of procedures for private investment (in the form of foreign direct investment- FDI) in extracting energy from renewable energy sources. These include provision of fiscal and financial incentives under a wide range of programmes being implemented by the Ministry of New and Renewable Energy, Government of India- and simplification of the procedures for private investment, including FDI, in renewable energy projects. The policy is clearly directed towards a greater thrust on over all development and promotion of renewable energy technologies and applications.

India is one of the countries most involved in developing the use of renewable energies and is trying to make the opportunity for investors more attractive than costly. To promote renewable energy technologies in the country, the government has put in place some subsidies & fiscal incentives. The Indian Renewable Energy Development Agency has been set up under Ministry for Non-Conventional Energy Sources and is a specialized financing agency to promote and finance renewable energy projects. Some of the new measures are income tax breaks, accelerated depreciation, custom duty/duty free import concessions, capital/interest subsidy, and incentives for preparation of Detailed Project Reports (DPR) and feasibility reports.

This was looking at government contributions and government financing to propagate renewable energy. But the private sector has, can and should contribute to renewable energy financing. Even though renewable energy may be a relatively unexplored funding avenue, and some of the technologies may be new and undertested- renewable energy projects provide a commensurately higher risk-adjusted return on capital. Funding can be provided by banks, non-banking financial institutions and private equity funds, both Indian and foreign- in the form of venture capital, private equity and project finance.

Some of the many factors that make India a great investment destination for new and renewable energy firms across the world are the facts that electricity demand is growing at 8% annually, and a capacity addition of about 92,000 MW is required in the next 10 years. India has a large domestic market with immense absorptive capacity for electricity. According to a study by the McKinsey Global Institute (MGI), India's consumer market will be the world's fifth largest (from twelfth) in the world by 2025 and India's middle class will swell by over ten times from its current size of 50 million to 583 million people by 2025. Also, India has the largest number of listed companies, 10,000 across 23 stock exchanges, as well as the third largest investor base in the world.

India's chief strength comes from its large pool of well-educated, managerial, technical, scientific and skilled people, adept in the English language with innovative skills and talent. There is also cheap labour, India's speeding growth, its future potential and its political and economic stability, liberal investment policies and reforms, innovative and technologically advanced products being manufactured in India and low cost and effective solutions. Obviously, more and more renewable energy projects will be financed privately in the future.

A closer look at the role of Project finance here is necessary. This method of funding, in which the lender looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure, plays an important role in financing development throughout the world. Project Finance is usually for large, complex and expensive installations that might include, for

example, power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunications infrastructure.

Equators Principle was a term coined in 2003 by top ten global financial institutions and their vision was this principle should be adopted globally by every financial institution where they consider the environment and the social risk of a project before sanctioning loans to the corporation. Equator Principle wanted adoption in both northern hemisphere and southern hemisphere and the term equator was close enough to represent the balance perfectly.

The Equator Principles are a credit risk management framework by keeping in mind the environmental and social risks in financing the project. Equator principles provide minimum standards for due diligence and serve as a common baseline and framework for the implementation by each institution adopting these principles for its own internal social and environmental policies, procedures and standards related to its project financing activities. Equator Principles Financial Institutions (EPFIs) commit to not providing loans to projects where the borrower will not or is unable to comply with their respective social and environmental policies and procedures that implement the EPs.

Currently 75 financial institutions have adopted the equators principle (73 EPFIs and 2 Associates) in 28 countries have officially adopted the EPs, covering over 70 percent of international project finance debt in emerging markets. The EPs have become the industry standard for environmental and social risk management and financial institutions, clients/project sponsors, other financial institutions, and even some industry bodies refer to the EPs as good practice.

The Equator Principles have changed the face of the development and energy finance industry. Development and application of the Equator Principles (EPs) has been a huge step forward for the industry, in terms of having a common framework and language pertaining to environmental and social issues in the project finance industry based on an external and respected benchmark, namely the International Finance Corporation Performance Standards and the World Bank Group Environmental, Health and Safety Guidelines. The EPs have consequently become the standard for assessing and managing environmental and social risk in project financings. It will not be long for them to be adopted in India as well, and so renewable energy businesses should prepare themselves to adapt to them.

So what is the current scenario on renewable energy in India? Sustainable energy investment in India went up to US\$ 3.7 billion in 2008, up 12 per cent since 2007 and this is likely to increase much more in the coming years. It included asset finance of US\$ 3.2 billion, up by 36 per cent. Venture capital and private equity saw an increase of 270 per cent to US\$ 493 million. Mergers and acquisition activities totalled US\$ 585 million. Most acquisition activity was centred on biomass, small hydro and wind projects, according to UNEP report, Global Trends in Sustainable Energy Investment 2009.

The GOI is encouraging foreign investors to establish renewable energy based power generation projects on the BOO, i.e., build-own-operate, model. The GOI also provides exemptions/reductions in the excise tax duty on the manufacture of most renewable energy systems and devices such as flat plate solar collectors, solar water heaters and systems, Solar PV cells, windmill systems, and any specially-designed devices which operate those systems (e.g., including electric generators and pumps running on wind energy, bio gas plants and bio gas engines, etc.); The GOI provides "soft" loans on favourable terms to manufacturers and users for commercial and near commercial technologies through the Indian Renewable Energy Development Agency, and some of the Indian nationalized

banks and other financial institutions for identified technologies/systems. The renewable energy industry is identified as a 'priority sector' by the RBI to obtain loans from banks, and the GOI provides a facility for third party sales of renewable energy power.

The government has created a liberal environment for foreign investment in renewable energy projects. Foreign investors can enter into joint venture with an Indian partner for financial and/or technical collaboration and for setting up of renewable energy-based power generation projects. There is a liberalised foreign investment approval regime to facilitate foreign investment and transfer of technology through joint ventures. Proposals for up to 74% foreign equity participation in a joint venture qualify for automatic approval. 100% foreign investment as equity is permissible with the approval of Foreign Investment Promotion Board. Various chambers of commerce and industry associations in India can be approached for providing guidance to the investors in finding appropriate partners. Government of India is also encouraging foreign Investors to set up renewable energy-based power generation projects on build-own-operate basis

Government of India is promoting medium, small, mini and micro enterprises for manufacturing and servicing of various types of renewable energy systems and devices. The industrial policy measures include exemption of industrial clearance for setting up of renewable energy industry, exemption of clearance from Central Electricity Authority for power generation projects of up to ` 1 billion, five-year tax holiday for renewable energy power generation projects, soft loan made available through IREDA for renewable energy equipment manufacturing, facilities for promotion of export-oriented units for renewable energy industry, financial support extended to renewable energy industries for taking up R&D projects in association with technology institutions, power project import allowed, allowance to private sector companies to set up enterprises to operate as license or generating companies, customs duty concession for renewable energy parts/equipment, including for machinery required for renovation and modernization of power plants, and excise duty on a number of capital goods and instruments in the renewable energy sector has been reduced/ exempted.

How can the Government raise the funds for these projects? One possible, though highly unpopular way would be - by raising the price of fossil fuels, and using it to subsidise renewable energy projects. The short-run price elasticity of oil, the amount by which consumption of oil changes in the short run when its price changes, has usually been observed to be low. Given technology in use, consumers can reduce the consumption of oil by making some behavioural changes. However, the long-run price elasticity of oil has been observed to be high. Over the long run, a higher price of oil creates incentives for adoption and development of technology which is not intensive in its use of oil. Either the use of alternative sources of energy becomes more profitable, or companies invest in fuel-efficient technologies. This has been seen in the automobile industry, in which significant R&D went into the development of small, fuel-efficient cars while consumers all over the world were seen preferring more efficient cars.

In conclusion, we would like to answer the question: can India meet all energy needs with renewable energy and can innovative financing help enable this process? The answer is: India is a nation in transition. Considered an "emerging economy," increasing GDP is driving the demand for additional electrical energy, as well as transportation fuels. Coal fired generation currently provides two thirds of the generation capacity, and hydropower supplies the other third. Yet, India is blessed with vast resources of renewable energy in solar, wind, biomass and small hydro. In fact, the technical potential of these renewables exceeds the present installed generation capacity. Financing methods, such as

project financing based on the Equators Principle, amongst others will be crucial in making renewable commercially accessible and viable.

Renewable energy remains a small fraction of installed capacity, yet India is blessed with over 150,000MW of exploitable renewables. It makes sense to the authors that all efforts and investment should consider accelerating these sustainable energy resources before committing to the same fossil fuel path as other nations, who have chosen this path in the past. The fossil fuel strategy will surely bring price volatility from dwindling supplies and added pollution from carbon combustion. Tapping India's wind, solar, biomass, and hydro could bring high quality jobs from a domestic resource. Extending the electric grid between all states, and ultimately between neighbouring nations will expand international trade and co-operation on the subcontinent.

List of Selected References:

Banerjee, Rangan; (2007) "Capacity Building for Renewable Energy in India"; IIT Bangalore

Barclays (2004), "Finance services and the equator principles", Business Leaders Initiative on Human Rights, Report 2: Work in Progress, pp. 23-7.

CHRISTOPHER WRIGHT AND ALEXIS RWABIZAMBUGA, (1974), Institutional Pressures, Corporate Reputation, and Voluntary Codes of Conduct: An Examination of the Equator Principles

Jane Andrew, (June 2007), The Equator Principles, Project Finance and the Challenge of Social and Environmental Responsibility

Meisen, Peter; (2006) "Overview of Renewable Energy Potential in India", Global Energy Network Institute

Pava Moses; (2007), "GETTING TO THE BOTTOM OF 'TRIPLE BOTTOM LINE'", Business Ethics Quarterly:105-110

Thomas, W. (2006), "Equator Principles?", International Financial Law Review, September, www.iflr.com Wright, C. and Rwabizambuga, A. (2006), "Institutional Pressures, Corporate Reputation and Voluntary Codes of Conduct: An Examination of the Equator Principles", Business and Society Review, Vol. 11 Iss. 1, pp. 89- 117.

Timothy. Environment (May 2005): Converting the Equator Principles to Equator Stewardship O'Riordan, 47. 4-0_2.

Young, J. (2006), "Making Up Users", Accounting, Organizations and Society, Vol.31, pp.579-600.