Foreword

Renewable energy has arrived. In matter of a decade, it has grown from a fringe player to a mainstream actor in the energy sector.

In the past ten years, installation of renewable energy for electricity has grown at an annual rate of 25 per cent. It has reached 30,000 MW as of January 2014. During this period, wind power installation has grown ten times and solar energy has grown from nothing to 2,500 MW. Currently, renewable energy accounts for about 12 per cent of the total electricity generation capacity and contributes about 6 per cent of the electricity produced in the country. Renewables, therefore, produce more than twice the amount of electricity produced by all nuclear power plants in the country. In 2012-13, the electricity produced by renewables was equivalent to meeting the per capita annual electricity requirement of about 60 million people. More than a million households in the country, today, depend solely on solar energy for their basic electricity needs.

The growth of renewable energy has changed the energy business in India. It has, in many ways, democratised energy production and consumption in the country. Before the renewable sector became a significant player, the energy business was all about fossil fuel-based big companies and grid-connected power—they dominate even today. But today there is an alternate energy market in which thousands of small companies, NGOs and social businesses are involved in selling renewable energy products and generating and distributing renewables-based energy. This trend is likely to accelerate because of two key policies of the government.

The first is the Electricity Act, 2003. The Act has opened up the rural electrification market to decentralised distributed generation systems. It promotes decentralised generation and distribution of electricity involving institutions like the panchayats, users' associations, cooperative societies and NGOs in rural India not under the purview of distribution companies. In addition, private developers are free to set up renewable energy based generators and sell electricity to rural consumers.

The second impetus to decentralized renewables comes from rooftop solar policies of state governments. States like Gujarat, Andhra Pradesh, Uttarakhand, Karnataka, and Tamil Nadu have policies to promote solar energy generation from rooftops of residential, commercial and industrial buildings. The response to

these policies has been highly encouraging. Although the results of this policy are likely to be realized slowly, the stage for re-inventing electricity generation with power from rooftop installations has been set. In the coming years we could see thousands of energy producers feeding the grid or supplying electricity to consumers through local mini-grids. We could also see millions of consumers generating their own electricity and feeding the surplus to the grid. The fact is we are just beginning to realize the potential of the renewables to open up the energy market and democratise energy generation and consumption.

Performance Downturn

But all is not well with the renewable energy development in the country. In the past two years, renewable energy development has taken a backseat. Installation of renewable energy has gone down significantly in 2012-13 and 2013-14, compared to 2011-12. In 2011-12, about 3,200 MW of wind power was installed. But installation came down to 1,700 MW in 2012-13 and less than 1,246 MW in 2013-14 (till January, 2014). Solar power installation too has suffered. In 2011-12, 906 MW of solar power was installed. In 2013-14 (till January 2014) only 523 MW have been installed.

The status of off-grid renewable energy is even poorer. There has been little effort by the Ministry of New and Renewable Energy (MNRE) in the past few years to take off-grid solutions to the country's unelectrified villages and hamlets. The decade-long Remote Village Electrification Programme (RVEP) was stopped in 2012. Under RVEP, solar home lighting solutions were distributed in about 10,000 villages and hamlets. The programme suffered from poor service delivery and corruption. It is anybody’s guess how many of the villages electrified by RVEP still have electricity or how many households are still using the solar home lighting systems they have received through the programme. MNRE had to come out with an energy access programme to replace RVEP. The programme envisaged installing mini-grids for rural electrification. But this programme has not taken off so far.

Policy flip-flop

The past two years were a complete wash out for the renewable energy sector in India. Investment in renewables went down from US $13.0 billion in 2011 to US $6.5 billion in 2012. This was largely because of policy uncertainty—some say paralysis—within MNRE.

Let's take the case of the solar energy. After successfully implementing the Phase 1 of the Jawaharlal Nehru National Solar Mission (JNNSM), nothing significant happened on Phase 2 till the beginning of 2014. The delay of more than a year brought about stagnancy in the solar industry.

In addition, MNRE announced that states will have to deploy, as part of their renewable purchase obligations (RPOs), about 60 per cent of JNNSM Phase 2's target of 10,000 MW of solar energy by 2017; the central government will support only 40 per cent of the installation. But in January 2014, MNRE announced its plans to install four Ultra Mega Solar Power Plants (UMSPP) of 4,000 MW each—all these four plants will be put up by the Centre. If these UMSPP are installed, they alone will meet most of JNNSM's targets. Bearing in mind that government programmes are about targets, if Centre is going to meet the bulk of the target, why should states be interested in doing more!

MNRE also did major flip-flop on wind power. Government incentives have played a major role in the wind industry's growth. Till the end of 11th Five Year Plan (FYP), the industry could avail of both accelerated depreciation (AD) and generation-based incentives (GBI). Then all of a sudden at the beginning of the 12th FYP, both subsidies were removed. This led to major reduction in investments in the sector. The removal of

subsidies, though, was not the only reason for the fall in investments: lack of proper grid infrastructure to evacuate power and delays in payments by state utilities have compounded the wind industry's problems.

MNRE has now announced a Wind Mission to ramp up installation of wind power in the country. It now proposes to bring back both GBI and AD incentives (GBI was reintroduced in 2013-14). But the question is how long will this industry survive on AD and GBI? Is there a long-term sustainability plan for the wind sector?

The biomass sector is in big trouble as well. Under the 12th FYP, a National Bioenergy Mission was announced to provide 20,000 MW biomass power by 2022. The mission will promote plantations to achieve its targets. But the fact is about 60 per cent of the country's grid-connected power plants that run on biomass have either shut down or are on the verge of shutting down. Out of about 118 projects in the major states—Andhra Pradesh, Chhattisgarh, Maharashtra, Tamil Nadu and Rajasthan—nearly 72 have shut down. The reason: rising cost of biomass due to competition within the biomass power industry and from other industries like cement and brick kilns. Now biomass industry wants an increase in tariffs. But should we pay more for power just because we want biomass power or should biomass power remain in the fray, only when it is economically efficient. If cement and brick kilns can utilise surplus biomass more efficiently and outcompete biomass power in the market, then they should be utilising this feedstock, not biomass power plants. Affordability of energy is as important as promotion of renewable energy.

It is quite clear that long-term policy perspective and policy certainty is the key for the sustained growth of the renewable energy sector. The experience of the past few years show that major changes in policy and practice are required to make renewable energy a real solution for meeting the energy needs of the country.

Agenda for change

Develop an integrated policy and plan for the renewables for 2050: Policies and plans to develop renewable energy have been haphazard. Two key levels of integration are missing: one, integration of the renewable energy sector with conventional energy sources and the other, integration of different sources of renewable energy themselves.

Currently India has five separate ministries for the energy sector: Ministry of Coal, Ministry of Petroleum and Natural Gas, Department of Atomic Energy, Ministry of Power and the MNRE. These ministries are only concerned about their own turf. There is a huge scope for synergies between different energy sources that can enhance economic efficiency as well as meet the energy needs of the country. For instance, the growth of grid-connected renewable energy will depend on the stability of the transmission grid and need for balancing power in the grid. This can only happen if there is integration between quick startup power sources like hydropower and gas and intermittent power sources like wind. Such synergy can only be developed if plans for each energy source are devised keeping interlinkages in view.

Similarly in the MNRE itself, each wing is concerned with its own territory. The ministry has a sub-sector approach and vision. The solar wing has a national solar mission to ramp up solar installation by 22,000 MW by 2020. The bioenergy wing is working on a national bioenergy mission. The wind energy division does not want to be left behind. So, it has proposed a national wind mission to reach 100,000 MW wind power installation by 2022. We should not be surprised if there is an announcement of a small hydropower mission as well. The fact is ministry does not have a vision for a holistic development of the renewable energy sector. This is leading to inconsistent policies, opportunities for interlinkages between various sources of renewable energy are missing and the ministry is not utilising its limited resources optimally.

For reasons of economic efficiency, better utilisation of infrastructure and environmental protection, India needs a long-term policy to integrate the different sectors of energy. This policy should specify the role of renewable energy in addressing the needs of energy access and energy security.

Be ambitious: Installation of renewable energy in India, especially grid-connected solar and wind, has always exceeded government targets and expectations in the past. In fact, one can argue that government has been quite pessimistic about the role of renewable energy in meeting the energy needs of the country.

The Integrated Energy Policy, 2006 had projected that in the most optimistic scenario, by 2031-32, India will have 30,000 MW of wind and 10,000 MW of solar power. The policy had put its faith in the biomass sector and had projected installation of 50,000 MW biomass power based on plantations and production of 15 million tonnes of bio-diesel and ethanol every year, by 2031-32. The expert group that wrote this report, projected 11 future energy scenarios for the country and estimated that renewable energy would contribute only 0.1–5.6 per cent of the total primary energy consumption in the country by 2031-32.

The 12th Five Year Plan (FYP) document has projected a fourfold increase in the installation of renewable power by 2021-22. But despite renewable power reaching 100,000 MW by 2022, the share of renewables in total commercial energy use will remain under 2 per cent in 2021–22. According to the plan document, the share of renewables in electricity generation will rise from around 6 per cent in 2012 to 9 per cent in 2017 and 16 per cent in 2030.

The resource allocation in the 12th FYP reflects the priority accorded by the government to renewable energy. The total plan outlay for the energy sector during 2012-17 is ₹10,94,938 crore. The outlay for the MNRE is ₹33,003 crore or about 3 per cent of the total plan outlay for the energy sector plan. The amount allocated to the Department of Atomic Energy—that contributes barely 2.5 per cent of total electricity production in the country—is ₹66,590 crore—more than double that of the MNRE.

Both the Integrated Energy Policy and the 12th FYP are not ambitious enough. While the Integrated Energy policy had projected 30,000 MW wind power installation by 2031-32, wind installation in the country has already reached 20,000 MW. Solar installation too will exceed the projections by many times.

The fact is the price of renewable energy (especially solar) is coming down and the price of fossil fuels is going up. India is, today, more and more dependent on imported fossil fuels and this dependency is growing every year. As per the 12th FYP, by 2021-22 imports will meet as much as 36 per cent of all the commercial energy demand in the country. India will depend on imports to meet 82 per cent of its crude oil and 27 per cent of its coal requirements by 2021-22.

The fact also is that climate change is palpable and is now hurting India's poor. India cannot ignore climate change and will have to start putting plans in place to reduce carbon emissions. All these require that we must be more ambitious about renewable energy.

Renewables are expensive compared to fossil fuels today but will be cheaper tomorrow. The benefits of moving to renewables are immense – energy security, climate protection, reduced pollution and health benefits for people.

Renewables for energy access: India has done well on grid-connected renewable energy, but has lagged behind on decentralised solutions. The biggest social and economic impacts of renewable energy will be in

providing clean energy to the energy poor. Presently 400 million people in the country have no access to electricity and hundreds of millions more get electricity for only a few hours. Decentralised renewable energy can provide basic energy access to all. This can be done by adopting a cluster-based approach.

The government needs to incentivise setting-up of small renewable energy plants with the same model it employs for grid-connected large solar or wind plants. These mini-grid projects should be provided with a feed-in-tariff (FiT) or Viability Gap Funding (VGF), like grid-connected projects. The difference between what consumers in the villages are willing to pay (say equivalent to the replacement cost of kerosene) and tariff discovered through the bidding mechanism can be financed through VGF or FiT. Entrepreneurs should be encouraged to decide their own mix of renewable energy to achieve the lowest price for a pre-defined service quality. Such projects can be made grid interactive. When the grid reaches villages, the mini-grids can be used to export power to the grid, as well as import from it depending upon growing needs or deficits.

This programme cannot be driven by MNRE. It will only succeed if states drive it. MNRE, however, will have to setup the regulatory framework, operational and performance guidelines and secure resources to support states in implementing this programme.

If operationalised, this model will revolutionise the way power is produced and consumed in India. Thousands of renewable energy based mini-grids can promote millions of small businesses and social entrepreneurs to create local jobs and build local economies. And, this will bring down the price of renewable energy too.

From subsidy to grid-parity: Renewable energy has grown in the country on the back of government subsidies, incentives and tax exemptions. Though these incentives are very important to jump-start the sector, there must be a long-term plan to progressively reduce subsidies and allow renewable energy to reach grid-parity. Reverse bidding has done very well in the solar sector and subsidies have reduced over time. The solar example can be emulated in other renewable energy sources like wind. Similarly, subsidies should incentivise performance and not physical achievements. In this regard, the move to reintroduce Accelerated Depreciation for the wind sector must be thought through carefully. Accelerated depreciation benefits given to other renewable energy sectors should also be evaluated.

Rationalise and enforce RPOs: RPO was amongst the policy measures used to mandate renewable procurement by state electricity boards, open access and captive consumers. Most states introduced their own targets in 2010, but none of them have enforced this mandate. In fact, Rajasthan Electricity Regulation Commission has reduced its RPO target from 8.5 per cent to 6 per cent. Tamil Nadu Electricity Regulation Commission reduced its RPO target from 14 per cent to 9 per cent—this, despite the state utility drawing 9.5 per cent of its electricity from renewables.

There must be a guideline for states to fix RPOs. Currently, different states have different thumb-rules to fix RPOs. Secondly, there is a need to enforce RPOs. This will give big impetus to the growth of the sector and also lead to development of renewable energy in all parts of the country, not just in a few regions.

Green norms for renewable energy: Renewable energy projects can have major ecological impacts if they are installed without proper environmental assessment and management. For instance, the impact of wind power on forest ecology can be very high. However, wind projects are being installed in forest areas without going through any environmental impact assessment (EIA). So far, 4,000 hectares of forests have

been diverted for wind power development and majority of this is only in two states, Maharashtra and Karnataka. Many of these wind power projects are coming up in the eco-sensitive Western Ghats.

Similarly, small hydro projects (SHP) are exempted from EIA. Multiple SHP on a single river can completely destroy a river's ecology. Guidelines for setting aside ecological flow for rivers and undertaking cumulative impact assessment, therefore, become very important. Large solar projects too have environmental impacts—they are land and water intensive. These issues should be addressed before setting-up large solar plants.

There is now a growing consensus within the environmental community about the necessity of proper environmental regulations for the renewable energy sector: it should be subjected to the EIA process. Today, renewable energy is small. But it will grow. If we don't have environmental safeguards now, the ecological impacts of this 'clean' energy source might become unmanageable.

Lastly, renewable energy must benefit the local community. Communities must have the first right over the electricity from renewables and they must benefit from the installation of renewable energy on their land.

These we think are the ways ahead for the sustainable growth of renewable energy in India.

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