



#### Knowledge Partners



## National Conference

### *'Sustainable Energy in India - Way Forward for Energy Security'*

Saturday, 23<sup>rd</sup> March, 2013, New Delhi

#### Background

Consumer Unity & Trust Society (CUTS International), Jaipur and Vikram Sarabhai Centre for Development Interaction (VIKSAT) implemented a project 'Demand Side Management (DSM) & Renewable Energy (RE) in India: Capacity Building of Civil Society Organisations (CSOs) – DREC Project', with support from Shakti Sustainable Energy Foundation (SSEF), India. The project was implemented in two states of India – West Bengal and Gujarat. The overall objective of the project was to increase long-term capacity/awareness of consumer groups to demand for DSM and RE initiatives especially in the context of climate change, and also to understand, document and communicate their specific needs to the relevant policymakers.

During the tenure of the project, CUTS & VIKSAT undertook several activities in West Bengal & Gujarat, which comprised baseline consumer perception survey of relevant stakeholders, followed by intensive consumer interaction programmes across different districts and capacity building programmes for the local CSOs. A final consumer perception survey was undertaken to determine the increased level of awareness, map practice changes, etc. through the project activities. The project continued over a period of 2 years (2011 - 2013) in four districts of Gujarat & West Bengal with support of local CSOs.

#### Objective of the Meeting

The purpose of the National Conference was to showcase the outcomes of the project to a larger audience and also to initiate a multi-stakeholder dialogue on the need and importance of demand side management and renewable energy in India. Further, the Conference facilitated a discussion between policy makers and stakeholders to draw a forward looking agenda focused on policy reforms in the area of conventional energy and clean energy sources.

#### Participation

The Conference received support from Gujarat Electricity Regulatory Commission, Gujarat Energy Development Agency, West Bengal Electricity Regulatory Commission and West Bengal Renewable Energy Development Agency. There were over 80 participants in the conference comprising policymakers, consumer groups, media persons, regulators, representatives of distribution companies, partner organisations, etc. from the states of West Bengal, Gujarat and few other relevant states.

## Opening Session: 'Role of Sustainable Energy towards Energy Security in India'

**Bipul Chatterjee**, Deputy Executive Director, CUTS International welcomed all the participants and noted that India experiences significant demand-supply gap (to the extent of 15 percent) in the electricity sector and it is expectedly high (at 32 percent) at peak load. Energy requirement in India is estimated to increase further by about three fold in the next twenty years. Demand Side Management and renewable energy has a huge potential to meet this demand, therefore DREC project is an attempt to map the awareness and capacity of consumer groups about such opportunities. He mentioned that during the baseline consumer survey, close to 50 percent of consumers were aware about the star rating and labelling. However, with continuous persuasion and sensitisation on the subject by the State Partner, it has increased to close to 81 percent and 93 percent in Gujarat & West Bengal, respectively. Similarly during the baseline consumer survey only 55 percent were inclined to pay extra for clean energy, which has now increased to 82 percent. However, the consumers are ready to pay only 1-5 percent extra on their current bill, provided they are assured of reliable energy. Interestingly, the number of consumers willing to pay extra decreased by 8 percent in West Bengal, as the cost of conventional energy (tariff) had increased from the time of baseline consumer survey.

Bipul flagged that the awareness about regulatory bodies was also found to be quite low in both the states during baseline consumer survey, i.e., 38 and 13 percent in Gujarat and West Bengal, respectively. However, given the active participation of the representatives of the regulatory commission during various events and activities implemented as part of the project, the awareness regarding the regulatory bodies increased to 60 percent in both the States. He highlighted that in the agriculture sector, approximately 50 percent of the farmers were aware of energy efficient pump-sets but very few were using the same. One of the key reasons of farmer's not using energy efficient pump-sets was because of initial capital investment, which is quite steep and they cannot afford to pay for the same. Further, they are not sure of the quality of the pump-sets, as compared to conventional ones that they are using in terms of its efficiency and reliability.

Bipul further elucidated that inspite of awareness generation workshops organised at the local level, awareness regarding energy efficient pump-sets increased by only 6 percent in Gujarat and close to 20-25 percent in West Bengal. However, one can say that there is no correlation between awareness and practice. As shown from the survey results, fair numbers of farmers in both the States are aware but are not using the pump-sets, for reason explained above.

He emphasised on the need for effective regulation to ensure long term sustainable energy products. He also focussed on the need to strengthen electricity regulation through CSO's participation.

In conclusion, Bipul suggested to the relevant policymakers in West Bengal to focus on effective implementation of State renewable energy policy and need for financial incentives. Whereas in Gujarat the need is to focus on popularising energy efficient pump sets.

**Deepak Gupta**, Senior Programme Manager (Power), Shakti Sustainable Energy Foundation, discussed demand side management and consumer awareness. Talking about the key aspects of energy security, he mentioned three points: availability, accessibility and technical viability. He insisted that policymakers should come out with policies that are suitable for business models.

Discussing the survey results, he expressed his satisfaction that people are aware and willing to pay more for clean energy. He pointed out that clean energy is more economical in long run and soon there will be grid price parity in solar energy. He also expressed his concerns over the gaps which exist in our country at micro and macro levels. He highlighted that DREC project was an attempt to bridge the gap between consumers and policy makers to facilitate higher uptake of renewable energy and energy efficiency. He envisaged the role of CSOs as the most viable medium to bridge the gap.

**Praveen Saxena**, Director, Ministry of New & Renewable Energy, Government of India, mentioned that energy generation from renewable source would be around 55,000 MW by 2017. Wind and solar contributes to around 40 per cent of renewable energy. He mentioned that close to 10 billion renewal energy systems have been installed that includes bio gas, cooking stove etc. out of which 30–40 percent were distributed in the last five years. Citing the example of Ladakh he said that there are a large number of solar panels installed in that area and the area is largely dependent on solar energy. He emphasised and asked CUTS to play an important role in making things functional.

**Dr Ketan Shukla**, IFS, Secretary, Gujarat Electricity Regulatory Commission mentioned that climate change is a challenge for economic change. Even developing nations face a huge challenge of gap between demand-supply and energy security. He mentioned that renewable energy is very important for development. Referring to survey results of Gujarat, he mentioned that it is good to see that approximately 90 percent of the respondents were of renewable energy resources. He highlighted that Gujarat was the first state to nominate Gujarat Energy Development Agency (GEDA) as a nodal agency. He recognised that the centre of everything is consumer, who should be taken care of; and in order to achieve this goal, policies should be implemented effectively. He also said that if we can tap just 0.8 percent of solar energy, then the energy requirement of the whole world could be solved. He also insisted on needs for good policy, pragmatic approach and consumer awareness.

Dr. Shukla further noted that, as an outcome of DREC Project a cadre of local CSOs capacity has been formed to interact with policymakers and to ensure that consumers voice is given due consideration on matters related to electricity. Given the importance and relevance of the project GERC has supported this initiative throughout and Dr. P. K. Mishra, Chairman, GERC also attended some of the activities and had an opportunity to engage with CSO's and other relevant stakeholders.

**Prasad Ranjan Ray**, Chairperson, West Bengal Electricity Regulatory Commission noted that regulatory system in India is still in a nascent stage. It is just 10 years old, and to expect its proper functioning is premature. He said that energy security is meaningless without the three factors: accessibility, affordability and sustainability. He expressed concern over inefficient transmission mechanisms and said that there should be proper coordination between supply and demand side management. Given that, renewable resources will play a very important role in the years to come, he urged that there is a need for discussion between policy makers, regulatory agencies and consumers so that a proper policy can be framed keeping in focus the interests of the consumers. He expressed his concern over lack of able consumer organisations to bridge the gap between policy makers and consumers. Referring to the survey undertaken by

CUTS, he said that there is need for taking a larger sample size and extension of projects in other states as well.

## Session I: Consumers Perception on Demand Side Management and Renewable Energy in Gujarat and West Bengal

**Chair:** Prasad Ranjan Ray, Chairman, West Bengal Electricity Regulatory Commission

### Presenters

- Ankur Baruah, Project Coordinator, Vikram Sarabhai Centre for Development Interaction
- Keya Ghosh, Director, CUTS, Calcutta Resource Centre

### Discussants

- Omkar Jani, Principal Scientist, Gujarat Energy Research and Management Institute
- R Gopichandran, Director, Vigyan Prasar, Department of Science & Technology, Government of India
- S P Gon Chadhuri, Head, Ashden India Collective
- D P Joshi. IAS, Director, Gujarat Energy Development Agency
- Sushobhan Bhattacharya, Director-in-Charge, West Bengal Renewable Energy Development Agency

**Ankur Baruah** and **Keya Ghosh** in their respective presentations, stated the specific objectives of the study as gauging the level of awareness among various stakeholders on RE and DSM, understanding consumers' willingness to pay for RE and identification of various roadblocks to effective implementation of initiatives pertaining to RE and DSM. The context of the project was to bring about long-term capacity/awareness of consumer groups so that they can demand for DSM and RE initiatives; and the specific needs of consumers can be documented and communicated to relevant policy makers. They briefly explained the key project activities, which included baseline and final consumer surveys, in order to gauge consumer perception and awareness about climate change, power supply and its quality and energy efficiency.

### KEY SURVEY FINDINGS: GUJARAT

- 96.8 percent of the respondents were aware that climate change is happening
- 25-30 percent gap between awareness and use of energy efficient (EE) products across all stakeholders
- Nearly half of the respondents have a fair idea about identification of EE products
- Willingness to pay for clean energy by government, industrial, commercial, household, farmers and CSOs is up to 62, 80, 78, 61.5, 54 and 59 percent respectively

They highlighted some of the key learning's from the consumer surveys. Consumers are concerned about increasing power and fuel prices which is taking toll on their budget and prioritisation of expenses. There is very little information about the EE products and RE technologies. The concept of energy audit is still new and availability of qualified energy

auditors remains an issue. CSOs though have a scope for increasing peoples' participation in grievance redressal, tariff determination and regulation, their participation currently in the regulatory system is nominal. Amongst many others, one major finding was the willingness to pay up to 5-6 percent extra for renewable energy based and EE power products. In the end, they presented a graphic representation of the visible perception change of the respondents between the baseline and final consumer surveys.

### **KEY SURVEY FINDINGS: WEST BENGAL**

- 93 percent of the respondents across all stakeholder categories are now aware of star label and its benefits.
- 78 percent of the farmers are aware about BEE labelled pump sets and 66 percent felt it is worth investing in EE pumps.
- 63 percent of the farmers (grid connected) were found to be aware of time of day (ToD) tariff system but only 47 percent were actually found taking benefits of TOD metering system.

As a positive outcome of the project, Keya highlighted that, an appreciable section of those surveyed said that they have shifted to EE practices like using CFL, star labelled equipment, judiciously using energy, shifting to energy efficient pumps, etc. She also mentioned the interventions by local partners at various levels.

### **DISCUSSANTS**

**Omkar Jani**, Principal Scientist, Gujarat Energy Research and Management Institute (GERMI), made three key points in his intervention.

- Need for mass publicity of RE based power and the benefits to be accrued from it, with the support of the media. Successful solar-park case studies should be documented.
- Absence or lack of good business models to encourage large participation base.
- Energy efficiency and its potential benefits have always been underestimated.

All of these three issues need to be acted upon and addressed if the RE power base of the country has to be expanded.

**R Gopichandran**, Director, Vigyan Prasar, Department of Science & Technology, Government of India, summarised the message from both the presentations. He explained the important points of the logical framework; level of awareness amongst consumers, the influence of out-reach mechanisms and what are the capacity building needs of consumers. He said that since energy-efficiency and its benefits are not easily visible, this makes it the most under-estimated environmental friendly technology dimension. The predominant focus should be on changing individual, voluntary behaviour, rather than changing structural factors, or technological development, economic growth, demographic factors, institutional factors and cultural developments (TEDIC factors). He summarised and concluded by giving a background for consolidation of the role of civil society organisations (CSO's) in this regard.

**S P Gon Chaudhuri**, Head, Ashden India Collective, raised some points for further deliberations and way forward of the project. He informed that we can classify energy sector into two parts,

one being product oriented programmes and other being Utility, Discoms and other power generators. He noted that mere investment is not sufficient, as investment without awareness will go in vain. The Ministry of New and Renewable Energy recently invested INR 10 mn in building and giving away solar devices to consumers, but most of them turned out to be non-functional. Earlier also, solar panels were installed in government schools and hospitals, which failed. Proper functioning of these devices requires regular checks and discipline, most of all renewable power has to be valued.

He further elucidated that off-grid renewable energy generators are also of two types. One, which is pushing all its power to the grid and has no linkages with the consumers and other community based off-grid system like mini-grid/micro-grid. He emphasised that there is no regulation for the later. As renewable energy cannot match the parity soon, he demanded separate regulation for the off-grid generators. It will help in restoring the trust of investors in off-grid who are not willing to invest in this sector due to uncertainty involved due to lack of regulation.

**D P Joshi**, IAS, Director, Gujarat Energy Development Agency (GEDA), emphasised the need to create literacy and awareness regarding the importance of clean energy sources. There is also a need to disseminate information regarding energy-efficient devices, and consumer's organisations, such as CUTS can play an important role in this aspect. Collaboration with CSOs such as women self-help groups is important. Speaking on the issue of the recent solar roof-top generation programme in Gujarat, he pointed out that manufacturers of solar devices, especially which are to be deployed at the household level, have to be increased if any success of this new programme is to be achieved.

**Sushobhan Bhattacharya**, Director-in-Charge, West Bengal Renewable Energy Development Agency (WBREDA), highlighted three major concern areas, first, non-functioning of renewable energy systems due to lack of human resources and technical know-how. Second, people after getting training from WBREDA to comprehend such issues and technical information migrate to cities for higher salaries. Therefore WBREDA has recently started training women and children, as their migration rate is quite low. Finally non-availability and high price of land, makes installation of renewable energy plants unviable for the agency. Recently, the agency has decided to go for roof-top solar power plants to address this concern. At the end he also highlighted the lack of coordination between the departments and ministries as a big challenge for renewable energy development and noted that most of the problems can be solved through better coordination and cooperation.

## **FLOOR DISCUSSION**

**Soudeh Jamshidian**, in her intervention inquired if there has been any research on how the off-grid power projects have impacted the lives of the benefitted people. Have these people formed or have been assisted to form communities for the future? **Mr Gon Chaudhuri** replied saying that there has been research and activity in this arena; some groups like Prayas have carried out initiatives relating to community formation. Additionally he also mentioned that off-grid solar projects are coming up in Bihar and Gujarat in a big way.

**B B Tewari**, mentioned that there is an absence of any consumer oriented planning in the Electricity Act of 2003. Next, he said that there is a need to standardise the manufacture of solar

products in the country. To this, **Dr Jani** replied that given the solar manufacturing base in the country, it is more important to ensure increased supply of the solar products, each with some basic standards and periodical servicing..

**Udai S Mehta**, Associate Director, CUTS International, mentioned the off-grid power project at Gosaba in West Bengal, which got redundant after grid connectivity of Gosaba. He raised the question about appropriate business model to ensure sustainability of off-grid renewable energy power projects. He also asked about the ways to address challenge emerging due to lack of political will. **Gon Chaudhuri** replied that entrepreneurs have to be protected, from excessive regulation, in the right way so as to make them facilitators of successful off-grid projects. **Dr Jani**, in his reply to the second query, said that if some form of a win-win business model be organised, political constraints would be automatically off-set. Also, schemes should be planned such that the financial costs are equally divided, and the government has to pitch the minimum.

**Prasad Ranjan Ray**, Chairperson, West Bengal Electricity Regulatory Commission, concluded the session and focused on the importance of interaction with the local community organisations. In his view, the challenge is to bridge the gap between government departments and the local community organisations. Unless the gap is bridged rural electrification on a sustainable basis would be a distant dream.

#### **KEY POINTS**

1. Need to create more awareness regarding green technologies and their use.
2. Dissemination of information regarding energy efficiency and the potential benefits to be accrued from it to the stakeholders
3. Urgent need for business models, to ensure sustainability of off-grid projects

#### **Roundtable Discussion on 'Policy Reforms for Suitable Energy Security in India'**

**Chair:** Kirit S Parikh, Chairman, Integrated Research for Action & Development

#### **Discussants**

- Bipul Chatterjee, Deputy Executive Director, CUTS International
- Ashish Khanna, Lead Energy Specialist, South Asia, World Bank
- Dr Ketan Shukla, Secretary, Gujarat Electricity Regulatory Commission
- Prititosh Ray, Member, Governing Body, West Bengal Renewable Energy Development Agency
- R N Pandya, Sr. Project Executive, Gujarat Energy Development Agency

**Bipul Chatterjee** laid emphasis on the social and political economic issues with respect to harnessing RE & DSM to ensure energy security. He said that while the project findings show that farmers are ready to shift to more sustainable energy sources, the strong political muscle of the diesel lobby is to be looked at. He emphasised the role of consumer groups, CSOs and CBOs towards transforming the drive for renewable and energy security. He suggested for deliberation on community driven movement to achieve it.

**Ashish Khanna** briefly touched upon the key challenges in the Indian power sector such as fuel, land and water resources availability, balancing rapid growth and expansion with environment and social sustainability and, most importantly, the weak operational and financial health of state run power utilities. He also touched on the specific challenges in the arena of RE, EE and DSM, providing universal access, etc. He highlighted that lack of environmental assessment, institutions, infrastructure, reliable data and need for better coordinated and targeted government policies and programmes pose problems in designing effective policies and programmes. He also spoke about the opportunities and potential of regional integration in the power sector. He stressed that India needs to look at policies that will facilitate cross-sectoral cooperation and build institutional capacity.

**Dr Ketan Shukla** stressed that the country does not need any more policies but what we need is effective implementation of the policies. He mentioned that Gujarat has been successful because of the fact that the government does not interfere in implementation and also because of independent regulators who could operate as they felt best. He mentioned the importance of learning from the experience of countries that are much ahead in terms of RE. He highlighted the importance of peak and off-peak load management, grid integration at high voltage stage and not at distribution point. He also stressed on monitoring of grid reliability and stability. He said that energy accounting should be made compulsory for all developers, Renewable energy Purchase Obligations need to be strictly adhered to by all the States and utilities. He also opined that reverse bidding has worked well in Gujarat.

**Prititosh Ray** said that the present scenario calls for a new Renewable Energy Act, since the Electricity Act is not equipped adequately to handle issues. He opined that renewables were not given enough encouragement as compared to thermal generation. He also stressed that thermal generation has been given a lot of leeway so that generation could be hiked and greater access ensured. While debating that conventional/thermal energy is less expensive than renewable energy, the cost of coal is never calculated on actual basis (only mining and lifting costs are included), neither the environmental and social costs included. Such practice of sweeping costs under the carpet on a continued basis has kept the apparent price of thermal power low. Therefore, a proper policy is needed that will assess the costs realistically.

He also highlighted that some of the old thermal power generation plants operate at an efficiency level that is as low as 15 percent, which is very much unacceptable. The cost of RE generation is always calculated as a standalone which is not the case with thermal, it being grid connected, so the cost is distributed evenly amongst the crores of consumers. This is not true for RE where the cost of power generated by an off-grid decentralised plant is to be borne by a handful of consumers.

He suggested that a cess may be put on thermal generation to be used to boost renewable generation, but observed that unfortunately policy makers shy away from such decisions citing the possibility of rising price of power. He stressed that the present policy is anyway not successful in regulating price rise and soon enough thermal power will be at par with RE in terms of generation cost. He stressed that in the arena of efficiency though efficient equipment is encouraged, practices should be more strongly looked at. He highlighted that almost 20-25 percent of power is wasted at the consumer end and proper load management will go a long



way to prevent that. He concluded by saying that all these factors need to be handled by a new Act and/or Policy.

**R N Pandya** stressed that EE and DSM are the most sensible solutions and easier to pursue with the Energy Conservation Act already providing the platform. He however mentioned that adequate efforts are not being taken towards promoting EE. He also opined that there is little coordination between different ministries and departments that deal with energy like petroleum, power and renewable energy. He stressed the importance of reducing oil demand and suggested that a new or reformed policy is needed to promote RE and EE aggressively with more budget allocation. He suggested that government should consider end user subsidies instead of just subsidising big projects. He also cited the importance of consumer awareness in enhancing the uptake and use of RE and EE.

## **FLOOR DISCUSSION**

**Mr Parikh** posed few questions to take the discussions forward. The first question was what more is required in EE arena - whether subsidies need to be given to encourage consumers to buy EE equipment or not.

**Mr Khanna** opined that incentivising the manufacturing process to promote manufacture of super-efficient equipment's is needed along with commercialisation of technology and drive for new technology. He suggested for institutional EE measures through State nodal agencies, like building codes.

**Mr Parikh** agreed that super-efficient equipment is required, and incentivising manufacturers could be a solution. He also stressed on need for training of implementing officers at city levels, departments and municipalities to ensure the skill and capacity to implement such codes. He also suggested tagging JNNURM funds disbursement with implementation of efficiency measures and drives by urban bodies.

**A question was raised that, why energy efficiency measures are mostly looked from the end consumers arena? Why independent power producers, their generation, transmission and distribution processes are not looked into as areas where such measures can be implemented?**

**Mr Ray** agreed with the concern, added that though the discussion was mainly on DSM, the inefficiency of generators is a big issue. Inefficient generation, transmission and distribution pose a big cost to the system. He stressed that only manufacturing EE equipment will have little impact if load management is not taken seriously.

**Mr Khanna** also agreed with the concern and said that enhancing efficiency in the supply side is very much on the agenda of the World Bank and it encourages the same through government ownership of the drive and shared that India has come up with a very good incentive driven policy in this direction.

A suggestion was also made that simply incentivising the manufacturing process will not suffice. Adequate supply of the energy efficient equipment, consumer awareness on the availability of such equipment and the incentives to consumers for saving energy is also required. Some other

observations made included the satisfaction of consumers regarding the benefits of the EE equipment, the performance, life and reparability of the equipment has to be considered. The problem of free power and power theft in the agricultural sector in many states makes incentivising energy saving meaningless.

**Mr Parikh said that a long term vision is required regarding India's sustainable energy future which led to the next set of questions- What will the mix (wind, pumped storage, solar, biomass, nuclear, etc.) consist of and whether the system can be run ensuring grid stability.**

**Mr Ray** said that the issue of cost will crop up again when deciding about the appropriate mix because non-thermal sources will be more expensive. He also cited that large scale power generation in India will be difficult in near future if we are not looking at nuclear. **Mr Khanna** pointed out that India being an energy scarce country and it should tap all sources that are socially and environmentally permissible, where the biggest constraints will be technology and efficiency. Replacing 10000 mw of sub-critical coal driven power plant with ultra-critical will save as much carbon emissions as 100000 mw of solar

**S P Gon Chaudhuri** pointed that the plant load factor of solar and wind is very low and they can only serve as spinning reserve. There has to be a predictable source for power because solar and wind cannot serve the purpose of a base load station. Solar and wind can be additional resources, but not the base load sources. May be nuclear in a safer form could be thought of. Our contribution from renewable must be more so that India can continue to explore the thermal avenue for another 75-90 years. In the long run, nuclear with solar and wind could be the mix for the future. He also posed a question regarding doing away with subsidies. He opined that only if the cost of construction and drawing the grid to remote areas (through schemes like Rajiv Gandhi Grameen Vidyutikaran Yojana and losses in the transmission lines are considered as subsidy and removed, then only renewable energy will be viable in terms of costs.

**Mr Parikh** said that the government needs to question: what is more sustainable is to extend the grid to the remotest location or support decentralised RE driven generation. Also there is this concern of providing grid quality power to people wherein decentralised RE generators may not be able to match up.

**What is the best way to promote RE- feed-in tariff with power purchase agreements for a 10-15 year span or a comparative reverse bidding? Would Renewable Energy Purchase Obligation work unless there is a uniform RPO all through the nation, unless there are penalties, unless there is a floor price and an upper bound on price is set for the country?**

**Mr Parikh** admitted to the politics surrounding tariff but argued that the government will have to come around in due time and realise that rationalising the tariff will be inevitable unless it wants more inflation and slowing down of GDP growth. He also stressed the importance of researchers, academic institutions etc. to engage with the government and citizens; and to sensitise them on issues pertaining to tariff.

**Dr Shukla** suggested that in the initial stages, feed-in tariff is good as proved by Gujarat. He stressed the need to ensure financial closure for the developers so that development in RE happens. He also stressed that RPOs should be made mandatory but not all states should be

targeting all different kinds of sources. Depending on geographical advantage and available sources, each state should have appropriate portfolios. He also highlighted the need for capacity building and establishment of independent regulators.

One of the participants observed that though feed-in tariff works well in the initial stages, with new and more entrants, competitive bidding should be encouraged. She further added that availability of finances for RE developers and giving a push to the domestic manufacturers of needed equipment will help bring in more players, help in competitive bidding and ultimately bring down prices.

**Mr Parikh** said that feed-in tariff and competitive bidding need not be an either or situation, it is a combination of both that may work.

**Mr Khanna** however observed that in the face of rapidly changing solar technology, feed-in tariff may be risky and competitive bidding is more desirable. For cases where technology change is not so rapid, feed-in tariff is more workable.

**Mr Parikh posed the last question on the issue of institutional reforms and capacity building- What kind of institutions are to be considered and which is the kind of institutional reforms are needed, is it only the independence of regulators or more.**

**Mr Khanna** said that regulators maintaining an arm's length distance from the political agenda are crucial along with stress of proper human resource management. State institutions need to have well defined human resource management policies in place, freedom in the form of lateral recruitments, and accountability. All these will lead to institution building. Also important is stability of the tenures so that the top management that is initiating the change process stays on for the time that the process is on and till the change process stabilises.

**Questions were raised on the possible role of Panchayati Raj Institutions in promoting sustainable energy use and also how to build capacities of forums like village level committees to ensure that they promote energy security.**

**Mr Khanna** said that the state utilities are not good at managing village level electricity supply very efficiently and, therefore, there is a need to have a shared perspective in this regard and rope in social community groups, as franchise in the process. Even Electricity Act provides for community involvement in collection or community managed private owned structures.

**Mr Parikh** however opined that private sector would be better off in this regard with a private entrepreneur managing a cluster of small village plants with enough plants under his kitty so that it has the economies of scale to help earn sufficiently. He also pointed out that for any successful drive a synergy between government regulations and private initiatives need to be there and convergence will be required.

**Omkar Jani** stressed that the right approach should be utilised towards promoting greater access and sustainability. He also said that net-metering technology will help a lot in this regard. If the consumer is made aware of their right to generate renewable energy in their own premises and sell back excess energy to the grid, it will be easy to popularise RE. **Mr Ray**

stressed that Discoms need to have binding RPOs wherein all the extra energy generated by the consumer is purchased by them with net metering in place.

**A question was posed on what policies or business models can ensure capacity building in local community institutions.**

**Mr Khanna** opined that government should stay away from implementation of programmes of capacity building. Success models from different states could be looked at, particularly in Andhra Pradesh and Bihar where women have very successfully handled ownership of assets. It is also important to mix capacity building with incentives of income, gender inclusive drives and benefits.

**Udai Singh Mehta** flagged that in addition to political interference, business interference is also a reality when it comes to independence of regulators and other players at the policy level.

**Mr Parikh** concluded the session by answering a question posed on the need for separate departments and ministries for different aspects of energy. He also stressed the importance of coordinating and integrating them and opined that a good way maybe by promoting competitive markets where the prices and markets take care of the integration by themselves.

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