Innovative Thought Forum

ROUNDTABLE ON "RENEWABLE ENERGY FOR AGRICULTURE AND RURAL ENTERPRISES"

AHMEDABAD, 23RD FEBRUARY 2019

1st Floor, A-7, Safal Profitaire, Corporate Road, Near Prahladnagar Garden, Ahmedabad – 380 015.

Review of Policies:

- Renewable energy on the radar of G.O.I since energy crisis of 1973. Department of new energy sources (DNES) created many programmes and implemented under various heads by central and state governments.
- A new Ministry of new and renewable energy (MNRE) created in for special thrust.
- MNRE tagged with Ministry of Power under one minister to bring holistic combination.
- Extra attention provided to renewable energy under the NDA government led by Shri Narendra Modi with ambitions targets to address issues of global warming, climate change, pollution, etc.
- Several innovative implementation and business models tried by state government in space of solar pumps, rooftop, off-grid, wind, biomass, biogas, etc.
- Decentralized distributed generations of power through renewable tried out by various governments with attractive subsidies and incentives.
- "KUSUM" announced in the recent budget to motivate farmers to use their farmland to produce solar power and create additional source of revenue. Announcement of innovative programmes by state governments like Gujarat under the banner of Surya Shakti Kisan Yojna (SKY).
- Many other programmes also announced in the recent part like
  - GOBAR DHAN :- For galvanizing organic, bio and agro resources into DHAN.
  - SATAT :- Sustainable alternative technologies for affordable transportation.

Discussions:

- All the policies and programmes around supply side. Demand side not understood and hence not a part of the entire thought process of policies.
- Two recent reports highlight urgent need to look at the demand side.
  - ✔ Clean energy innovations to boost rural immune by council of Energy Environment and water (CEEW) – Oct 2018
  - ✔ Rural Electrification in India by Smart Power India.
- The above books as well as design thinking show the need to analyse the demand of energy for rural homes and enterprises afresh. Also to rework at the way energy is made available and delivered including costing, pricing, financing, etc.
- Demand of power from farmer and rural enterprises not 24x7. Pumps need to work for a few hours for around 60/70 days in a year on average. Rural Enterprises like food processing, workshops, repair shops, textiles, garmenting, assembly lines, metal fabrication, plastic fabrication, etc need to work mostly in day. Likewise, farmers also need intermittent power for primary operations like cutting, threshing, transportation, etc.
- Book:- "Achieving Universal Energy Access in India" by Deepak Gupta and others also worth reading, clearly shows that power delivered in rural areas costlier by around Rs. 2.00 for unit as against in concentrated areas in the centralized model. Huge T&D losses for rural supply discouraging utility companies to serve rural and agriculture sectors.

- Paradigm shift in India & other countries as renewable energy is cheaper than fossil energy on like to like basis, Solar can produce any quantum of power at around Rs. 3.00 per unit for bigger and Rs. 3.50 per unit for smaller installations.
- Wind energy also fed in the grid at around Rs.3.00 per unit from producing areas.
- Gujarat pioneers in out of box thinking. Solar Pumps are bought and installed at remote farms by utility companies. Finding that pumps are used only for 65/70 days, conceived idea of grid connected solar pumps. Pilot done at Dhundi by IWMI,Anand to study pros and cons, resulted in the premise that power can be additional crop for the farmers. Culmination into "KUSUM" of Govt. of India to give chance to farmers to look at solar power as a new crop, GIPCL did a pilot of solar PV installation of 5 MW to show that in the farming, solar installation does not make significant difference in crop output when installation is done intelligently and crops are selected intelligently.
- Surya Shakti Kisan Yojna (SKY), is a major step in Gujarat that will give farmers Rs. 7.00 per unit when fed into the grid.
- Water and energy closely intertwined. Subsidy on power is actually subsidy on water. Efficiency in water used through micro irrigation system is a must. SKY has indirectly motivated farmers to aim for water use efficiency so that the farmer can feed more power in the grid for earning more at Rs. 7.00 per unit.
- Many other successful works done across the country, like:
  - ✔ Solar cold rooms by combining solar PV and thermal energy storage through phase change materials.
  - ✔ Solar cold rooms by combining biomass gasifiers and vapour absorption chillers.
  - ✔ Solar Charkhas
  - ✔ Solar looms
  - ✔ Solar Dryers
  - ✔ Biomass systems of varying types for gas supply in the villages or conversion into bio CNG or for producing power.
- Distributed decentralized generation of power through various schemes in operation without big success. Proper financial and revenue models yet to evolve. Innovations in integrating different streams and showcasing success through proper revenue, finance, business models and proven technologies now available for solar, biogas, wind, biomass, etc., all in place. Proper integration including storage will pave the way for power units of designated size like 10 KVA, 20 KVA, 50 KVA, 100 KVA or more can be easily mainstreamed.
- Biogas is a huge opportunity GOBAR DHAN, SATAT, NBMMP, organic fertilisers scheme etc. now waiting to explode. More organic wastes are now convertible into biogas and organic fertilisers.
- Solar and wind is discontinuous source and Biomass and Biogas is a continuous source. If needed ,combining the two can meet needs 24x7. Methods to add energy storage through batteries and phase change materials is also proven. Systems can be customized and combined economics of such systems can indeed give new picture.
- Solar thermal energy application is old but not popular. Clear economic advantages of solar

thermal for community cooking, process heat, water heating etc. Need to evolve innovative business models without subsidy but smart planning.

- Many hidden advantages with renewables
  - ✔ Biogas production always accompanied by bio slurry that is excellent for liquid slurry as well as solid organic fertilizers and changes economics dramatically.
  - ✔ Reduction of dependency on imports of fossil fuels improving our national security.
  - ✔ Lower pollution and carbon footprint.
  - ✔ Better health through waste reduction and clean environment.
- Cold chains can be easily and economically powered through renewables to reduce wastage and increase income of farmers.
- Small windmills not mainstreamed in India though in use in many other nations. Focus entirely on large windmills.
- India using renewable energy in several innovative ways and ahead of even countries like U.S.A in many respects
- Micro grid and off-grid policy in place. Allows generation and distribution at local levels without any licence .Several options can be developed.
- Telecom sector experience to be tapped for integrating various streams to have power as per needs.
- Purchase of biogas plants by dairies and distribution to farmers/members already successful in Yashwant Dairy and other places.
- Development and growth linked to access, availability and affordability of energy.
- Focus on subsidies in various schemes distorting the ecosystem. Time to now shift to massive awareness, promotion and appropriate financing models.

Outcomes and Key Takeaways:

- Demand of energy to be mapped for agriculture,rural homes and enterprises thoroughly.
- Hierarchy of energy demands to be analysed.
- Use of renewables for both electrical and thermal to be pushed.
- Energy economics for the above to be freshly worked out factoring in capital expenditure (Capex), operating expenses (Opex) and running expenses.
- Energy storage through viable routes like PCM, water, batteries to be adopted.
- Extension of successful technical and business models to be done.
- With changing paradigm of costing of renewables as against fossils, subsidies to be withdrawn and thrust to be given to promotion, marketing, innovation etc in business models.
- Work aggressively to make transmission lines capable for absorbing renewables .
- Make PPA structure consistent and stable
- Utility companies to think of themselves as energy providers irrespective of route and focus on delivering solutions to people in effective manner.

- Solar thermal applications to be pushed:
  - ✔ Solar driers
  - ✔ Solar cooking systems for community, schools, institutions, etc.
  - ✔ Solar cooking for a group of schools in the manner of "Akshaya Patra".
  - ✔ User friendly solar cookers and solar water heaters for individual families.
  - ✔ Solar thermal for water and steam in institutions

Pilotable Projects:

- Development of power units of 10 KVA /25 KVA on solar and other renewables for work as minigrid
- Small cold room of one tonne using solar and PCM
- Small cold room of one tonne using solar and biogas
- Redesign of solar Charkha
- Renting of solar pumps
- Foldable biogas plant
- Hot water and steam generated through solar /biogas/biomass as a service
- Solar drying services in relevant areas like fisheries ,fruits and vegetables
- Implementation of Gobar Dhan scheme in a panjrapole or Gaushala for producing biogas ,power and fertilisers
- Development of small windmill

List of Participants.

Sr. No.	Name	Email id	Mobile Number
1	S.B. Dangayach	sbdangayach@gmail.com	9998822680
2	P.K. Sinha	piyushsinhaahd@gmail.com	9825070891
3	V.K. Srivastava	vksps@gmail.com	9824043498
4	Atul Upadhyay	atulupadhyay@yahoo.co.in	9327064440
5	Ashok Garde	ashokgarde@hotmail.com	9427010612
6	Karan Dangayach	dangayachkaran@gmail.com	9825060546
7	Madhuri Narra	bio1@gmail.com	9924098664
8	D.P. Mishra	debeeprasad.mishra@gmail.com	9974772983
9	Prakash Vani	vani.platypus@gmail.com	9824067064
10	Mayank Patel	mayank@cradle-edii.in	9825306287
11	Jay Pandya	jayant.s.pandya@gmail.com	18562358687
12	Balmukund Pandya	balmukund.pandya@atctower.in	9979559596
13	Harsh Gor	harsh@tss-india.com	9898633390