



Agency for Non-conventional Energy and Rural Technology (ANERT) was incorporated way back in 1986 when renewable energy was in its very early days in India. Today, ANERT has evolved into a state-wide force that has to its credit creating a solar-powered Kerala, with ground-mounted, rooftop and even floating solar plants. We have **Dr. R. Harikumar** discussing the growth of ANERT over the years, and explaining how Kerala could contribute significantly to India's solar power capacity target of 100 GW by 2022. An interview by **Venugopal Pillai**.

With an enabling ecosystem, solar rooftop target can be attained

— **Dr. R. Harikumar**, Director,
Agency for Non-conventional Energy and Rural Technology (ANERT)

ANERT, as we understand, was formed in 1986, a time when there wasn't much awareness of renewable energy. What was the main objective behind the inception of ANERT?

ANERT, the Agency for Non-conventional Energy and Rural Technology, was constituted in 1986 under the State Committee for Science Technology and Environment [STEC, presently the Kerala State Council for Science Technology and Environment (KSCSTE)]. This was registered under Charitable Societies Act by the Government of Kerala. The administrative control of ANERT was later been transferred to the Power Department. ANERT has its headquarters at Thiruvananthapuram and has one district-level office in all 14 districts. ANERT is also functioning as the State Nodal Agency (SNA) for the Ministry of New and Renewable Energy Sources (MNRE), Govt. of India.

The main objective behind the inception of ANERT was to promote, coordinate and implement various programmes related to different renewable energy sources/technologies in Kerala. The original objective of ANERT formalised as:

"The object of the agency is to gather and disseminate useful knowledge in the various fields of Non-conventional Energy, Energy Conservation and Rural Technology, conduct studies, demonstrate, implement and support implementation of schemes and projects in these fields, thereby deal with the problems arising out of the rapid depletion of non-renewable energy sources; upgrade the technologies used in rural areas as well as introduce appropriate new technologies with an aim to reduce drudgery, increase production and improve the quality of life".

Tell us how ANERT has grown in terms of its reach in Kerala.



A 2-mw grid-connected solar power plant at Kuzhalmannam, Kerala



Floating solar power plant at Banasurasagar

The period 1987-1990 was the inception phase where the ANERT team was built up and various activities were initiated. The NPIC programme based on fixed chulha, biomass gasifier, community chulha, small hydro projects, solar lantern, solar street lights, solar pumps, wind mill pumps, solar water heaters etc. were all initiated during this period. Integrated Rural Energy Programme (IREP) programme was launched in 1987 (seventh five year plan) by the Government of India with the aim of developing institutional capabilities at the state, district and block levels to formulate and implement area based micro level plans to tap in an integrated manner all types of energy sources.

The original IREP scheme implemented in the Seventh, Eighth and Ninth plans involved a block-level approach. This was replaced by a district-level approach, with an intensive focused implementation in selected cluster of villages in each district during the Tenth Plan period. During this period ANERT could establish itself as the agency which promoted improved biomass cook stoves through trained personnel called as "self-employed workers". In three phases, ANERT was instrumental in electrifying more than 20,000 households in the remote villages many of them inside

forest boundaries.

When did ANERT sharpen its focus on grid-connected solar rooftop, and what are the programmes under which ANERT is helping grid-connected solar rooftops?

ANERT ventured into the rooftop solar sector with its flagship project – the 10,000 rooftop project in 2012-13. The project involved installation of solar power plants of 1kW capacity each, on the rooftops of beneficiaries who could afford to pay the cost of such a unit deducting the Central and State subsidy (which added up to about 50 per cent of the system cost). ANERT had empanelled companies interested in and capable of undertaking the installation work. Orientation trainings were arranged in various districts to create awareness among public about the scheme. MNRE and AREAS having appreciated this model recognised ANERT with the national award for the most innovative roof top programme in 2016-17.

ANERT formulated and obtained approval for its first grid-connected rooftop power plant scheme in 2014-15. Till 2016-17, ANERT has been promoting rooftop solar through the subsidy route alone, availing central subsidy of around 30 per cent and providing state subsidy of around 20 per cent. From 2017-18

(XIII Plan period), ANERT, in order to scale up the installed capacity, is focusing more on creating an enabling ecosystem for promoting solar plants.

How many grid-connected solar rooftop installations has ANERT facilitated so far, and what is the total installed capacity?

Installation of about 265-270 mw large-scale power plants are in progress or completed. About 26 mw of rooftop systems have also been completed through ANERT-MNRE programmes (including off-grid). There are a large number of systems being installed, which are not getting reported to ANERT. Including such projects, it is expected that rooftop systems with a total capacity ranging anywhere 26 mw to 100 mw may have been already installed in Kerala.

Kerala is home to India's largest floating solar power plant. Tell us more on this landmark project.

This project was conceived and implemented by KSEB, the public sector electricity utility in Kerala. A 500-kW plant was commissioned in the Banasurasagar reservoir as a demonstration system. Ferrocement type floats were used in this project. Though the cost of this pilot system is very high, it is presumed that while planning for large-scale floating solar projects, costs shall come down.

How do you see the scope for floating solar power plants in Kerala?

With limited land area in this small state of Kerala, floating solar is the next option after rooftop. ANERT has proposed a program to go for floating solar using crowd funding from Keralaites. There are many people in the state residing in multi-storeyed apartments, rented buildings, tiled homes, etc. who do not possess roofs suitable enough to install solar plants. Also there are people who would not like to

install a plant and take care of its maintenance issues and a few people would like to install lesser size plants in the range of 500 W, whereas the available grid connected plants in the market range from 2 kW. For such people who would really like to contribute towards the green growth process of this state, ANERT proposes such a scheme wherein they would be compensated through a monthly payment/ deduction in their electricity bill, commensurate to their investment.

What is the situation with respect to net-metering in Kerala, and how do you see this promoting grid-connected rooftops?

Kerala has a net metering policy in vogue which really helps in promoting grid-connected systems. The public sector utility KSEB, and the Department of Electrical Inspectorate provides maximum support in promotion of grid connected systems.

We understand that ANERT has promoted Akshay Urja Service Centres to assist developers from outside Kerala that have planned to set up installations in the southern state. Please discuss the scope of these centres and how you plan to develop the same statewide.

A total of 140 centres will be set up in all assembly constituencies of Kerala. These centres are expected to provide repair, maintenance and after-sales support services to the consumers. The empanelled vendors of ANERT can make use of these Centres to provide technical



Solar-powered rural electrification in Kerala

support to their installations in the respective jurisdiction. ANERT will provide opportunities to the vendors to provide hands-on training specific to their systems, to technical staff in these Centres, in addition to the general training offered in the beginning. Each centre will have three technicians and one-third of these will be women, thus bringing in a gender dimension to renewable energy support. Availability of such centres will also aid in reducing the overall cost of the system.

Please explain in brief how ANERT collaborates and cooperates with MNRE to promote the cause of solar rooftops in Kerala.

For promotion of all our schemes, ANERT has close association with MNRE. ANERT also provides its facilitator service to successfully implement MNRE schemes, like the RESCO model rooftop plants over government buildings.

What is your view on India's target of attaining 40 GW of grid-connected solar rooftops by 2022? How do you see the years ahead for Kerala, with respect to rooftop solar?

India has fixed a tentative target of 100 GW solar power by 2022. Towards this, Kerala is expected to have solar capacity of 1870 mw, which shall consist of 1000-mw large-scale solar power plants and 870 MW from rooftop solar systems (including grid-connected and off-grid).

ANERT believes that this is a realistic target, provided the enabling ecosystem is put in place. To just examine the viability of this target; even if 2 per cent of (of the total 1 crore) domestic consumers which fall in the highest-paying category installs an average of 2.5 kW rooftop system over the next 5 years, the total would be 500 mw. If 10 per cent of the highest tariff group— the commercial consumers opt for roof top plants—around 300 mw can be installed.

ANERT has a great role to play in achieving such a huge target. Renewable energy being qualified as variable, to overcome the perceived limitations, ANERT is in the process of creating a demo installation of wind-solar hybrid with energy storage aiming for a of 3 mw despatchable capacity, partnering with C-DAC for indigenous technology development suitable for our grid and local conditions.

ANERT is keen in collaborating with reputed national and international institutions and agencies to install new technology and business models including renewable energy service company, (RESCO), third-party leasing, community/cooperative investment, battery on rental for off-grid/hybrid systems, solar power pack on rental, etc. ■