

**ANNUAL REPORT 2003-04**  
**Agency for Non-conventional Energy and Rural Technology**  
**(ANERT, Kerala)**



**ANERT, PB No 1094, Kesavadasapuram, Pattom PO,  
Thiruvananthapuram -695 004**



## INTRODUCTION

The financial year 2003-2004 is marked as the major turning point in the history of ANERT due to the two significant decisions, one taken up by the Government of Kerala and the other by the Government of India. According to the resolution taken by the Government of Kerala the administrative control of the institution was transferred from the Science & Technology Department to the Power Department of the State and the decision of the Government of India to implement the modified scheme of Integrated Rural Energy programme had resulted in the restructuring of the field office set up of ANERT as well.

ANERT – the Agency for Non-Conventional Energy and Rural Technology was established in 1986 by the Government of Kerala, as an autonomous institution under the Science, Technology and Environment Committee (STEC) with the objectives of gathering and disseminating useful knowledge in 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 and thereby deal with the problems arising out of the rapid depletion of Conventional Energy Sources in the State; update 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. ANERT was also designated as the State Nodal Agency of the central Ministry of Non-conventional Energy Sources (MNES). ANERT had made significant strides in the development of renewable energy sources of the State during the past years, marked by the outstanding achievements like popularisation of more than 7.5 lakhs of improved firewood chulhas, installation of solar water heating systems with a total capacity amounting to more than 3 lakhs liters per day, electrification of about 20000 remote houses with Solar Photo Voltaic technology etc.

However, in accordance to the modifications made in the Science and Technology Policy of the State and the constitution of the Kerala State Council for Science, Technology and Environment (KSCSTE) in place of STEC (as per GO(P) No 76/2002/STED dated 06.11.2002), ANERT - like all other institutions that were functioning under STEC - was amalgamated to the Council vide the resolution taken on 22.02.2003 by the General Body of ANERT. But later on considering the specific functions of ANERT the Government decided to attach the organization under the Department of Power. Thus as per the Government order No GO (MS) 27/ 03/ PD dated 12.08.2003, ANERT became an institution under the Department of Power, Government of Kerala. The procedures to fulfil the necessary formalities of these changes are still underway.



## **DIVISIONS AND PROGRAMMES OF ANERT**

The functions of ANERT are basically oriented to carry out evaluation studies on the renewable energy resources of the State, planning as well as implementation of projects in the field of renewable energy sources and energy conservation, promotion of use of such devices in the state and taking up research work to support such activities. In order to cater to these basic functions, the organisational structure of the institution is divided into four major divisions as follows-

- I. Programme Implementation Division
- II. Integrated Rural Energy programme (IREP).
- III. Research & Development Division
- IV. Administration, Finance & Accounts, Purchase and Stores

A schematic representation of the administrative set up and divisions of the organization is given as Chart 1.





## **I. PROGRAMME IMPLEMENTATION DIVISION**

The Programme Implementation Division looks after implementation of various projects /schemes of ANERT, in the following areas: -

1. Solar Photo Voltaic Programme.
2. Wind Energy Programme.
3. Bio Energy Programme.
4. Micro Hydel Power Programme.
5. Solar Thermal Energy Programme.
6. Programmes for Dissemination of Improved Chulha.
7. Rural Technology Programme.
8. Publicity and Awareness Creation Programme.

Normally every year ANERT formulates and implements various projects under each of these schemes, structured in accordance with the MNES guidelines for the year. However the programmes for the year under consideration shows a definite slackening of activities resulted from the specific situations already mentioned.



### **Solar Photo Voltaic Programme**

Solar Photo Voltaic (SPV) Programme is one of the most important renewable energy programmes of Kerala, given the vast availability of Solar Energy through out the State. Solar Photo Voltaic technology refers to the conversion of the solar light into electricity using photovoltaic modules made of single crystal silicon wafers. The electricity thus generated could be used for operating electrical appliances directly or could be stored in batteries for use at non- sunlit hours. The major achievement of ANERT in the past, in the field of solar electricity generation are the Solar Village Electrification Programme carried out during 2000-2002 and the 25kW Grid Interactive Solar Power Plant installed during year 2000. Under the Solar Village

Electrification Programme, we have been able to electrify about 20,000 houses belonging to economically backward classes, in the remote isolated hamlets of Kerala. These locations were so remote and isolated (mostly within or in the fringe folds of the forests of Western ghats), that the people residing there could never even have dreamt of electric light or TV in their house. So the project was much more than an electrification programme as it opened up the opportunity to improve their living standard .It has allowed those rural poor to study or engage in home –based handicrafts as well as to gather information on the world around. On the other hand, the 25kW Grid Interactive Solar Power Plant installed on the terrace top of Vaidyuthi Bhavanam, Thiruvananthapuram – the Head Office of KSEB – has demonstrated the capability of SPV power generation even in the urban centres, for augmenting and supporting the existing grid and acting as a voltage support system. This power plant is pumping more than 25, 000 units of electricity to the KSEB grid every year.

The projects taken up under the SPV programme during the year 2003-04 were the popularisation of SPV Home Lighting Systems, Solar Street Lighting Systems and SPV pumps for irrigation or drinking water supply .The Ministry of Non–conventional Energy Sources (MNES) had sanctioned financial assistance for 1200 Solar Home Lighting systems, 120 Solar Street Lighting systems and 30 Solar Pumps during the year; necessary approvals from the State Government has also been obtained for this programme. But as per the guidelines put forward by MNES for the implementation of these projects, the devices are to be procured from among the manufactures/ suppliers empanelled on National Level by a ‘Joint Implementation Board’ constituted for the purpose by MNES. However, the Board has not yet published the final empanelled list of the manufactures/ suppliers. Thus, like all other State Nodal Agencies of MNES, ANERT also was not able to initiate the implementation phase of the sanctioned SPV programmes during this year.



## **Wind Energy Programme**

The State of Kerala has notable wind power potential that could be utilised for water pumping as well as electricity generation, but unlike solar energy the availability of this renewable energy source is highly location specific. ANERT had installed more than hundred windmill water pumps in Kerala in the past years. However the major achievement of the past is the detailed evaluation study of Wind Potential of the State carried out with the assistance of MNES during 1989-2000. The study revealed that there are 16 locations in the State suitable for economic generation of electrical energy. The total wind electricity generation potential estimated from these sites is 605MW. The activities taken up during 2003-04 under the Wind Energy Programme are the following.

### **1. Wind Resource Assessment Programme**

Under the National Programme for Wind Resource Assessment, MNES had sanctioned two sites for Kerala. The programme will be implemented jointly by ANERT and Centre for Wind Energy Technology (C-WET), Chennai. Pasavadikumbe in Kasaragod District and Kalyanathandu area in Idukki District are the two sites identified for the study. Foundation work for installing the mast at both the locations is now complete. 50 m high mast with data logger and sensors at 30 m and 50 m levels will be installed and the continuous wind data for one year will be collected from both these locations.

### **2. Wind Farm Project**

#### **i) Demonstration Wind Farm at Kuruvikkanam near Ramakkalmedu, Idukki**

The Administrative sanction for establishing a 2 MW wind farm under the demonstration scheme of MNES, was obtained from the State Government. The Government has also issued sanction to ANERT for taking possession of the land required for the project on payment of compensation amount as fixed by the Revenue department. Initial Survey for taking possession of the land is completed.

ii) Development of Wind Farm at Ramakkalmedu, Idukki

The State Government has proposed to invite competitive bids from private wind farm developers, for the development of wind farm at the 162Ha of revenue land at Ramakkalmedu. The land may be allotted to the successful bidders on piece basis. Government has also decided to frame guidelines for setting up wind farm in the above mentioned revenue land. As per the micro survey report, a wind farm of 25 MW could be established at this location.

iii) Power evacuation facilities

As per the guidelines, it is proposed that ANERT will provide necessary power evacuation facilities for the wind farms being established at Ramakkalmedu area. The report prepared by ANERT in this regard, with recommendations of the load flow study group of KSEB is presently awaiting approval from the Board.



### **Bio Energy Programme**

The Bio energy projects are viewed, as a solution to the waste disposal problem, which is drastically affecting environmental balances. The activities in this area comprises of biogas and electricity generation from organic waste products of agriculture, animal husbandry and domestic sectors. One of the major past achievements of ANERT in this field is the Taluk Level Biomass Resource Assessment study for Kerala, carried out by ANERT during the period 1998-2002. This was a project taken up as part of the National Biomass Resource Assessment Programme (NBRAP) of MNES, which conducted the detailed assessment of the bio-waste availability from Agricultural and Agro Industries activities in taluks pointed out by Agricultural Department as having higher biomass availability. The study was carried out in 13 taluks of Kerala and it revealed that these locations have a total potential for generation of 57 MW power from agricultural waste. Formulation and actual implementation of viable projects to harness this potential is yet to come up. However in the past years, ANERT was able to establish two biomass Gasifiers (for thermal



application) with total capacity equivalent to 200kW power and 26 biogas plants with a total of 530cu.m capacity.

**Table1**  
**Biogas Plants installed during FY 2003-04**

<b>SI No</b>	<b>Beneficiary Institution</b>	<b>Plant Capacity</b>	<b>Date of Completion</b>
1	Jamia Nadwiyya Edavanna, Malappuram	20 cum	20.06.03
2	Darunnajath Islamic Centre, Malappuram	15 cum	30.07.03
3	MAFM Charitable Trust, Malappuram	20 cum	15.10.03
4	Al Shifa Hospital Complex, Malappuram	15 cum	13.06.03
5	Mother Mary Hospital, Kozhikode	20 cum	15.06.03
6	Asso. For Welfare of the Handicapped, Kozhikode	20 cum	23.07.03
7	Islahiya Association, Kozhikode	20 cum	03.07.03
8	JDT Islam Orphanage, Kozhikode	15 cum	12.07.03
9	Sirajul Huda Educational Complex, Kozhikode	15 cum	12.06.03
10	Meppayur Salafiyya Association, Kozhikode	15 cum	31.10.03
11	Jawahar Navodaya Vidyalaya, Kozhikode	20 cum	31.12.03
12	Holy Trinity Ashram, Aranattukara, Thrissur	20 cum	16.10.03
13	Mother Hospital (P) Ltd, Thrissur	20 cum	31.10.03

The programmes taken up during the year 2003-04 was the continuation of the schemes sanctioned by MNES during the previous year. During 2002-03 MNES had accorded sanction for the construction of night soil based biogas plants with a total Central Financial Assistance (CFA) of Rs.20 lakhs. The eligible CFA for installing biogas plants of capacities 15cum and 20 cum were Rs.70, 000/- and Rs. 1,50,000/- respectively. In addition to this, Rs.30, 000/- and Rs.50, 000/- were allotted as ANERT's subsidy from State fund. The scheme was finally approved by the end of the year 2002-03 and so the implementation was carried over to the next

financial year. Accordingly during the year 2003-04, ANERT installed five night soil based biogas plants of 15 cum capacity and eight plants of 20cum capacity .The beneficiaries of this programme were the various hospitals and hostels of educational /social welfare institutions. The biogas generated in these plants is being utilized as cooking fuel in the beneficiary institutions. These plants, if properly maintained and operated, are capable of saving about 28,000 Kg LPG every year .The list of all the 13 biogas plants installed under this programme is given as table 1.



### **Micro Hydel Power Programme**

As per the stipulations of “Kerala Renewable Energy Policy“ declared by the Government of Kerala during 2002 [GO (MS) No.16/2002/STED dt.03.04.2002] ANERT was expecting to take up the responsibility to coordinate the development of Small Hydro Power projects up to 3MW capacities during the year 2003-04. Accordingly during the year 2002-03 ANERT initiated background activities and carried out preliminary site investigation of 34 sites, which has a total power generation potential of about 2000 kW. Among these 34 sites, 29 were pointed out by various Local Self Government Institutions (LSGIs), as the devolution of power to LSGI has made them the major developer of SHP projects for rural village electrification in the state. Two of these sites have been advanced to the implementation phase as well. The Expert Committee constituted by the State Government had also verified and approved these activities. But unfortunately by the beginning of the year 2003-04 itself (in the month of May 2003) ANERT was forced to freeze further activities in this regard by specific directions of the Government. Now, even after many communications this restriction order had not been lifted. As this stagnation of activities has attracted displeasure of Local Self Government institutions (who had been depending on ANERT to proceed on with the implementation of certain projects in their area), ANERT is presently refunding the amount deposited by them so that they could look for other sources of support for getting their projects implemented.



## **Solar Thermal Energy Programme**

Solar Thermal Energy devices like the Solar Water Heaters and Solar Cookers are economically viable and proven technologies for conserving the valuable sources of energy be it electricity or firewood or fossil fuel. During the year 2003-04, MNES had announced a novel scheme for conservation of conventional energy by promoting the use of Solar water Heating Systems in the urban area. The scheme offered considerable financial assistance to those urban local body institutions (the Municipalities and the Municipal Corporations) that modify their Building Rules for making the use of Solar water Heating Systems mandatory in all large buildings and commercial institutions where the use of hot water is necessary. The Central Financial Assistance offered was in the tune of Rs.5 lakhs per Municipality and Rs.10 lakhs per Municipal Corporation, which obviously was adequate to organise various programmes at local level for generating public acceptance to the programme, ultimately resulting in substantial savings of conventional sources of energy. The details of the scheme were communicated to Local Administration Department and Power Department. But unfortunately the response was highly discouraging and the programme didn't take off in the State.

During the year 2003-04 ANERT was able to give good publicity for the use of Solar Cookers and as a result 41 solar cookers were sold out to enthusiastic beneficiaries through our solar shop at Thiruvananthapuram. However the number of sales could have been much higher if some sales outlet could be made available in northern Kerala as well.



## **Programme for Dissemination of Improved Chulhas**

Popularisation of improved firewood chulhas to conserve firewood and protect women from the drudgery of smoke filled kitchen atmosphere was also a programme that had been carried out by ANERT since inception, under the National Programme for improved Chulhas (NPIC) of MNES. Past achievement of ANERT in this field amounts to the installation

of about eight lakhs of improved chulhas and more than 4000 trained Self-Employed Workers (SEWs) engaged in the field. Subsidies were given for all the improved chulha installations till 2001-02, with the financial support of MNES and State Government. Afterwards the subsidy was restricted to economically backward classes and institutions only, as MNES had withdrawn the national programme. However because of the visible benefits of the device, this programmes still moves on in the State in market mode. Presently ANERT, as the Nodal Agency, restricts our involvement as a promotional and facilitation agency in general and takes up specific programmes for promoting these chulhas among economically backward classes and for community cooking applications.

However during the year 2003-04, ANERT was not able to implement the programmes visualised for the year owing to non-receipt of necessary Government approvals. A proposal was placed before the Executive Committee of the Kerala State Council for Science Technology and Environment (KSCSTE) for the implementation of Improved Chulha Programme with a physical target of 6500 domestic (2+1) model chulhas for beneficiaries in BPL category and 230 pairs of community chulhas for Anganvadies and Schools with noon feeding programme. The financial target of the proposed programme amounted to Rs.34.79 lakhs, of which Rs.15.5 lakhs was expected as State share and Rs.19.29 lakhs was to be the beneficiary contribution. The proposal was approved by KSCSTE in its meeting held on 19.06.2003. But subsequently as the administrative control of ANERT was transferred from the council to the Department of Power, an action programme was submitted for approval of the Government. Unfortunately no approval was accorded till the end of the financial year and so the programme has not been commenced at all.



## **Rural Technology Programme**

ANERT visualize Rural Technology development as an area complementary to Renewable Energy development as the ultimate aim of both sectors is to improve the income and living standards of rural population. The activities normally taken up under the Rural Technology

Programme of ANERT are (1) inviting and sponsoring action research projects for the development and modification of tools for the improvement of productivity and removing drudgery especially among women and (2) providing training on various technologies relevant to the rural areas. Significant number of Rural Technology training programmes were successfully organised during the year 2002-03 and so the programme for 'Sponsorship of action research projects for increasing productivity ' was given priority during the financial year 2003-04.

Based on a detailed evaluation process, two projects were selected for support under this scheme, which are (i) 'Development of process technologies for the preparation of shelf stable convenience food products from Jackfruit at different stages of maturity' proposed by M/s. ARDRA, Vellayani, Thiruvananthapuram and (ii) 'Developing an improved design of Cashew Nut Cutting Machine ' proposed by M/s REEDIT, Kottiyam, Kollam. Unfortunately the organization that took up the first project has defaulted to submit interim reports and learned to have stopped the project work due to their internal problems. So legal action is initiated against them for recovering the funds already given. The second project has already completed the first phase and the work is progressing in such a way that it may be completed in another four months time.



### **Publicity and Awareness Creation Programme**

Each and every activities of ANERT have the ultimate aim to improve the standard of living of the common man in the State, either by increasing their energy availability through the utilisation of renewable energy sources or by providing devices to improve the quality of their energy consumption. These activities obviously demands considerable amount of public awareness creation and public education. ANERT so undertakes various forms of public interaction programmes every year. Participation in various exhibitions, demonstration of Mobile Renewable Energy Demonstration Unit, organization of seminars and release of advertisements were the type of public interaction programmes organised during the year 2003-04.

**Exhibitions:**

Participation in various exhibitions is one of the major publicity programmes taken up by ANERT every year. This has the advantage of capturing the attention of people from every walk of life, in their leisurely disposition and also gives the opportunity to display the various devices in the live form before them. Thus an exhibition provides the right forum for illustrating the significance of the use of renewable energy and energy conservation devices in the life of common people. As in the previous years, the central Ministry of Non-conventional Energy Sources (MNES) had sanctioned financial assistance for ANERT's participation, on their behalf, in a few major exhibitions in the State. Accordingly during FY 2003-04, ANERT participated in the four major exhibitions namely,

1. The Onam Festival Fair –2003, Kannur District
2. Ochira Pantharandu Vilakku Mahothsavam 2003, Kollam District
3. State Agricultural Mela 2004 – Thodupuzha, Idukki District
4. Aluva Sivarathi Mela 2004, Ernakulam District

Approximately eight lakh people had viewed these exhibitions. A central Financial Assistance of Rs 2.4 lakhs is expected from MNES in this regard.

MNES had actually provided sanction for participation in two more exhibitions namely the Flower Show 2004, Thiruvananthapuram and the Palode Agricultural Mela. However we were not able to arrange for the participation in these exhibitions, as the allotted fund was insufficient for the former and the information on the latter haven't reached us in time.

Apart from the MNES sponsored exhibitions, ANERT was able to participate in four other exhibitions of regional importance, meeting the expenditure under the State funds. They are,

1. National Technology Week Exhibition, Kochi
2. Karshika Mela 2003, Pampakuda
3. Khadi Utsav 03, Ernakulam and
4. Agri- Horticultural Industrial Exhibition 2003, Alappuzha

Not less than a lakh of spectators were introduced to the renewable energy technologies and devices through these exhibitions.

**Mobile Renewable Energy Demonstration Unit:**

The Mobile Renewable Energy Demonstration Unit (MREDU) of ANERT had also made a significant stride in public education during 2003-04. MREDU was demonstrated at 24 locations covering eight districts especially the northern most districts of Kasaragod and Kannur. Altogether MREDU carried out 123 days of demonstration, reaching out to not less than 5 lakhs of spectators. The locations of these demonstrations were so varied ranging from the spectacular festival places like Valluvanad Mahotsavam of Ottappalam to the School Science Exhibition held at the remote village of Ballakadappuram in Kasaragod. When large festival places were successful to capture the attention of large number of spectators literally from all walks of life, the small educational institution level demonstrations were effective in deeper interaction and study of the technology. It is notable that 16 of the locations of MREDU demonstrations were educational institutions, which undoubtedly benefited the enthusiastic younger generation.

**Seminar:**

ANERT had conducted a Seminar on Solar Energy at SDV School Grounds Alappuzha on 23<sup>rd</sup> December 2003, jointly with the District Agri-Horticultural Society of Alappuzha. The participants of the seminar were students and women activists of the various self-help groups in the district. The various aspects of the solar energy utilisation and the devices available for the same were introduced to them in this seminar. Demonstrations of the various solar devices were also arranged along with the seminar.

**Advertisements:**

Advertisements are viewed as another public interaction channel, which reaches out to the common people making them imbibe our message even with out any conscious effort from their side. During the year 2003-04 ANERT released advertisements in 39 publications of varying style and circulation. The themes of our advertisements were mainly the achievements of ANERT and the products for sale in the Adithya Solar Shop of ANERT.

**Renewable Energy Parks:**

The scheme for establishing Renewable Energy Parks in every district was formulated by MNES, with the objective to create awareness among the students, teachers and rural and urban masses, about the uses and benefits of renewable energy systems and devices. During the year 2003-04 ANERT submitted proposals to set up two District Level Renewable Energy Parks in the State, one in Thiruvananthapuram at the Kerala State Science & Technology Museum and the second one in Palakkad at the Institute of Printing Technology & Govt Poly technic, Shornur. Both the proposals were accepted and approved by MNES. MNES had released the formal sanction order and first instalment funds for both these parks. Necessary procedures to take up implementation work have already initiated. Both these parks may be commissioned in the coming year.

**Adithya Solar Shop:**

The Adithya Solar Shop is an activity visualised by MNES as complementary to the task of popularising and promoting the idea of renewable energy and energy conservation technologies. These shops are established in order to make the various renewable energy/ energy conservation devices available to those who are interested to buy and use them. At present there are three Adithya Solar shops in Kerala - one each at Thiruvananthapuram, Ernakulam and Thalassery (Kannur). The Adithya Solar Shop at Thiruvananthapuram is run directly by ANERT. During the year 2003-04 this shop has sold 41 Solar Cookers and 1975 Compact Fluorescent Lamps with a total turn over of Rs. 4.15 lakhs. However though much distressing, it is to be admitted that this is significantly less than the previous years achievement of Rs 23.6 lakhs and so demands focussed management in the coming year.





## **II. INTEGRATED RURAL ENERGY PROGRAMME**

The Integrated Rural Energy Programme (IREP) was conceptualised and pilot tested by the Planning Commission, Govt of India during Sixth Five Year Plan and launched as a centrally Sponsored Scheme in the year 1986-87 as part of the seventh Plan. The major objective of the programme was to develop an integrated energy planning and implementation framework in rural areas of the country so as to achieve effective alleviation of poverty and fast economic development. The basic motive of this programme is to improve the quality of life in the rural areas through a judicious mix of conventional and non-conventional sources of energy. Later on IREP was transferred to the Ministry of Non-conventional Energy Sources (MNES) with effect from 1<sup>st</sup> April 1994.

The implementation of the Integrated Rural Energy Programme (IREP) in Kerala had started in 1987-88 with one selected block – Wadakkancherry in Thrissur District. More development blocks were added in the subsequent years and by year 1998-99 ANERT has established two IREP Blocks in each district. Ever since the establishment, these project offices had been acting as the extended arms of ANERT reaching out to the rural masses through out the State. These offices enabled ANERT to achieve wider awareness creation as well as people's participation in the planning and implementation of various renewable energy projects.

However aimed at a more systematically planned, focussed and ground truth oriented implementation of the scheme, Government of India vide MNES order F No 49/3/2003/IREP dated 30.07.2003, had modified the IREP scheme as that to be implemented in the selected villages or village clusters under the monitoring of district level office. Accordingly during the current year ANERT has initiated steps to reorient the IREP implementation set up in the State. As per the guidelines issued by MNES for the implementation of this Centrally Sponsored Scheme of Modified Integrated

Rural Energy Programme, the major activities to be taken up for effecting this reorientation, were the following-

1. Selection of deserving village clusters and preparation of micro level energy plans for each selected village cluster.
2. Preparation of District level and state level Energy plans and updating of these plans on annual basis.
3. Implementation of Modal integrated Rural Energy Projects in the selected village clusters.

The MNES guidelines also directed that the implementation of the scheme may be made integrated and dovetailed with the ongoing developmental activities in the region. The objectives of the programme also included ensuring people's participation in the planning and implementation of the IREP plans and projects through involvement of Panchayats, voluntary organizations and institutions at micro level. Thus ANERT decided to select a Grama Panchayat in each district as the cluster of villages for the implementation of the Modified IREP scheme in Kerala. So all the IREP Project Offices of ANERT were directed to evaluate the various Grama Panchayats in their District according to the selection criteria instructed by MNES and select the most deserving Panchayat. Accordingly in the IREP Officers Meeting held at Ernakulam on 17.09.2003, Project Officers /Engineers from each of the Office presented the details of one or two clusters of village suitable for selection. Based on these details one cluster of village (a Grama Panchayat) each was selected from all 14 districts. A list of all these selected village clusters is given as Table 2.

Subsequently, the Project Officers/ Engineers who suggested the village cluster was entrusted with the task of preparing the Baseline Report with Micro Level Energy Plan for the selected village cluster. The content structure of the report was discussed and finalized in accordance with the guidelines issued by MNES. The draft reports prepared and submitted by the Project Offices were scrutinized in one day meeting held at the Head Quarters on 14.11.2003 and modifications were suggested. Accordingly the reports on all the Cluster of Villages in Kerala were finalized and forwarded to MNES for approval and central financial assistance.

**Table 2**  
**List of Village Clusters selected for the implementation of Modified IREP scheme in Kerala**

<b>Sl No</b>	<b>District</b>	<b>Name of selected Village Cluster</b>
1	Thiruvananthapuram	Vithura
2	Kollam	Aryancavu
3	Pathanamthitta	Perinadu
4	Alappuzha	Purakkad
5	Kottiyam	Aymanam
6	Idukki	Kanjikuzhi
7	Ernakulam	Kuttampuzha
8	Thrissur	Panamchery – Peechi
9	Palakkad	Sholayur
10	Malappuram	Chaliyar
11	Kozhikode	Koodaranji
12	Wayanad	Thondernad
13	Kannur	Payyavoor
14	Kasaragod	Panathady

Further more, steps were also initiated to create District Level IREP Offices as suggested in the MNES guidelines, instead of the two block level offices presently functioning in each district.

Apart from these activities of structural reorientation, various IREP Offices were also actively involved in their routine functions of awareness creation, propagation of various devices, field inspections and monitoring of implementation projects. Various IREP Offices were involved in the organization of ANERT-MNES participation in major exhibitions in the region; some of the offices arranged sale of various renewable energy – energy conservation devices like Solar Lanterns, SPV modules, CFLs, Portable Chulhas, components of Fixed Chulhas etc. and almost all the offices were involved in the field inspections and implementation monitoring for various projects like Solar Village Electrification Programme, Bio Energy Programmes and Wind Energy Programme.

As part of the human resource development /skill up gradation programme, Sri.R.Rajesh, Project Engineer was deputed to the training programme on “High Rate Biomethanation Treatment of Industrial and Municipal Waste“, organized by the Central Leather Research Institute, Chennai under the sponsorship of MNES and held at Chennai from 7<sup>th</sup> to 9<sup>th</sup> of January 2004.

Though the year 2003-04 had witnessed a lull of activities in the IREP, the programme is getting all set to take up new responsibilities under the scheme of Modified Integrated Rural Energy Programme.



### **III. RESEARCH & DEVELOPMENT DIVISION**

The Research & Development Division ANERT has pursued the following research projects during 2003-04.

#### **1. Cost Reduction of Solar Collectors**

This is an ongoing R&D project whose aim is to adopt slight design changes (including changes of material used for construction) to reduce the cost of solar flat plate collectors (without compromising on the efficiency) so that solar thermal equipments like water heaters become more acceptable to the common man. An MoU was signed with a private manufacturer for fabrication of collectors based on the new design to be developed by ANERT. (This was required since ANERT does not have any workshop facilities of its own). The literature survey for the project was completed and different designs already tested elsewhere are being studied. An interim report on this is being prepared and further works include mainly fabrication, testing and optimisation of new models of Solar Collectors.

## **2. Investigation Study on the Extraction of Energy from Industrial Wastes in Kerala**

This is another ongoing R&D project, which is directed towards assessment and quantification of waste generated in selected Industries in Kerala. It also involves finding the most efficient ways of extracting energy in usable forms from these wastes after considering the economic and environmental aspects. The various types of industries involved in the study are rubber industry, tea/coffee industry, food industry, agro-based industry and ayurvedic medicines industry. Individual reports on different types of industries were prepared based on information made available through literature survey. The compilation of all these reports relevant to the situation in Kerala is being prepared. Further works include visit to different industries, analyses of different kinds of wastes and finding optimal methods for waste-to-energy projects.

### **The Testing & Quality Control Laboratory**

ANERT is having a full-fledged Electrical and Electronics laboratory for conducting the testing and quality control of solar PV devices like Solar Lanterns, Home Lighting System, Street Lighting System, VRLA and flooded type batteries, SPV modules, inverters etc. and energy conservation devices like CF lamp with ballast, electronic choke, CFL street lighting system etc. The sample units of these devices collected from the field by our IREP Offices and the units received from suppliers and Government / Local Self Government Institutions were tested in this Laboratory. A fee is collected from the various departments for availing the testing and certification facility of this Lab. During the year 2003-04 an amount of Rs.7141/- has been obtained from other departments under this account.

During this year, many technical personnel from MNES and other State Nodal Agencies as well as experts from various R &D Institutions have visited and have remarked high appreciation on the facilities and functioning of the laboratory.



## FINANCIAL REPORT

### STATEMENT SHOWING THE DETAILS OF RECEIPT AND PAYMENT FOR THE YEAR 2003-04

#### ANERT

Receipt	Amount Rs.	Payment	Amount Rs.
Opening Balance	32860000.00	Salary and Wages	8097263.00
MNES	350000.00	Pension Contribution	300000.00
Non – Plan	4375000.00	Office Expenses	618112.00
Beneficiary share	5543290.00	Rent	453700.00
Interest on Deposit	1502462.00	Travel	223649.00
Other receipt	179437.00	Motor Vehicle	403832.00
		Repair & Maintenance	35800.00
<b>TOTAL</b>	<b>44810189.00</b>	<b>TOTAL</b>	<b>10132356.00</b>
		Closing Balance	34677833.00
<b>TOTAL</b>	<b>44810189.00</b>	<b>TOTAL</b>	<b>44810189.00</b>

#### IREP

Receipt	Amount Rs.	Payment	Amount Rs.
Opening Balance	82726120.00	Salary & Wages	10414816.00
State Plan	0.00	Pension Contribution	468611.00
MNES	3652000.00	Office Expenses	398227.00
Beneficiary share	49375.00	Rent	928180.00
Other receipt	40000.00	Travel	282176.00
		Motor Vehicle	134917.00
		Programme Implementation	1601019.00
<b>TOTAL</b>	<b>86467495.00</b>	<b>TOTAL</b>	<b>14227946.00</b>
		Closing Balance	72239549.00
<b>TOTAL</b>	<b>86467495.00</b>	<b>TOTAL</b>	<b>86467495.00</b>

### **Research & Development**

<b>Receipt</b>	<b>Amount Rs.</b>	<b>Payment</b>	<b>Amount Rs.</b>
Opening Balance	0.00	Programme Implementation	316480.00
State Plan	0.00		
MNES	0.00		
TOTAL	0.00	TOTAL	316480.00
Amount spent from ANERT Head	316480.00	Closing Balance	0.00
<b>TOTAL</b>	<b>316480.00</b>	<b>TOTAL</b>	<b>316480.00</b>

### **Solar Photo Voltaic Energy Programme**

<b>Receipt</b>	<b>Amount Rs.</b>	<b>Payment</b>	<b>Amount Rs.</b>
Opening Balance	10188392.00	Programme Implementation	1499089.00
State Plan	612000.00	Refund to MNES	2913000.00
MNES	3610000.00		
Beneficiary Share	555594.00		
TOTAL	14965986.00	TOTAL	4412089.00
		Closing Balance	10553897.00
<b>TOTAL</b>	<b>14965986.00</b>	<b>TOTAL</b>	<b>14965986.00</b>

### **SPV Village Electrification Programme**

<b>Receipt</b>	<b>Amount Rs.</b>	<b>Payment</b>	<b>Amount Rs.</b>
Opening Balance	1441025.00	Programme Implementation	45493582.00
State Plan	11352600.00		
MNES	0.00		
Beneficiary Share	812500.00		
TOTAL	13606125.00	TOTAL	45493582.00
Amount spent from ANERT Head	31887457.00	Closing Balance	0.00
<b>TOTAL</b>	<b>45493582.00</b>	<b>TOTAL</b>	<b>45493582.00</b>

### Wind Farm

Receipt	Amount Rs.	Payment	Amount Rs.
Opening Balance	27393053.00	Programme Implementation	0.00
State Plan	0.00		
MNES	30000.00		
TOTAL	27423053.00	TOTAL	0.00
		Closing Balance	27423053.00
<b>TOTAL</b>	<b>27423053.00</b>	<b>TOTAL</b>	<b>27423053.00</b>

### Wind Energy

Receipt	Amount Rs.	Payment	Amount Rs.
Opening Balance	1061069.00	Programme Implementation	863635.00
State Plan	16467900.00		
MNES	30000.00		
TOTAL	17558969.00	TOTAL	863635.00
		Closing Balance	16695334.00
<b>TOTAL</b>	<b>17558969.00</b>	<b>TOTAL</b>	<b>17558969.00</b>

### Biomass Programme

Receipt	Amount Rs.	Payment	Amount Rs.
Opening Balance	4354341.00	Programme Implementation	110625.00
State Plan	0.00	Refund to MNES	931125.00
MNES	654000.00		
TOTAL	5008341.00	TOTAL	1041750.00
		Closing Balance	3966591.00
<b>TOTAL</b>	<b>5008341.00</b>	<b>TOTAL</b>	<b>5008341.00</b>

### Biogas Programme

Receipt	Amount Rs.	Payment	Amount Rs.
Opening Balance	3165080.00	Programme Implementation	1747180.00
State Plan	0.00		
MNES	5600000.00		
TOTAL	8765080.00	TOTAL	1747180.00
		Closing Balance	7017900.00
<b>TOTAL</b>	<b>8765080.00</b>	<b>TOTAL</b>	<b>8765080.00</b>



### **Urban & Industrial Waste to Energy Programme**

<b>Receipt</b>	<b>Amount Rs.</b>	<b>Payment</b>	<b>Amount Rs.</b>
Opening Balance	4037943.00	Programme Implementation	0.00
State Plan	0.00		
MNES	225000.00		
TOTAL	4262943.00	TOTAL	0.00
		Closing Balance	4262943.00
<b>TOTAL</b>	<b>4262943.00</b>	<b>TOTAL</b>	<b>4262943.00</b>

### **Micro Hydel Power Programme**

<b>Receipt</b>	<b>Amount Rs.</b>	<b>Payment</b>	<b>Amount Rs.</b>
Opening Balance	12453620.00	Programme Implementation	24882.00
State Plan	0.00	Refund to District Tribal Development Officer, Kasargod	328792.00
MNES	500000.00		
TOTAL	12953620.00	TOTAL	353674.00
		Closing Balance	12599946.00
<b>TOTAL</b>	<b>12953620.00</b>	<b>TOTAL</b>	<b>12953620.00</b>

### **Programme for Dissemination of Improved Chulha**

<b>Receipt</b>	<b>Amount Rs.</b>	<b>Payment</b>	<b>Amount Rs.</b>
Opening Balance	21544709.00	Programme Implementation	117443.00
State Plan	1317500.00		
MNES	0.00		
Beneficiary Share	993240.00		
TOTAL	23855449.00	TOTAL	117443.00
		Closing Balance	23738006.00
<b>TOTAL</b>	<b>23855449.00</b>	<b>TOTAL</b>	<b>23855449.00</b>

### Rural Technology Programme

<b>Receipt</b>	<b>Amount Rs.</b>	<b>Payment</b>	<b>Amount Rs.</b>
Opening Balance	1168336.00	Programme Implementation	45000.00
State Plan	40000.00		
MNES	0.00		
<b>TOTAL</b>	<b>1208336.00</b>	<b>TOTAL</b>	<b>45000.00</b>
		Closing Balance	1163336.00
<b>TOTAL</b>	<b>1208336.00</b>	<b>TOTAL</b>	<b>1208336.00</b>

### Information and Publicity

<b>Receipt</b>	<b>Amount Rs.</b>	<b>Payment</b>	<b>Amount Rs.</b>
Opening Balance	0.00	Programme Implementation	455359.00
State Plan	0.00		
MNES	646989.00		
<b>TOTAL</b>	<b>646989.00</b>	<b>TOTAL</b>	<b>455359.00</b>
		Closing Balance	191630.00
<b>TOTAL</b>	<b>646989.00</b>	<b>TOTAL</b>	<b>646989.00</b>

### Energy Education Park

<b>Receipt</b>	<b>Amount Rs.</b>	<b>Payment</b>	<b>Amount Rs.</b>
Opening Balance	4348080.00	Programme Implementation	2607050.00
State Plan	0.00		
MNES	0.00		
<b>TOTAL</b>	<b>4348080.00</b>	<b>TOTAL</b>	<b>2607050.00</b>
		Closing Balance	1741030.00
<b>TOTAL</b>	<b>4348080.00</b>	<b>TOTAL</b>	<b>4348080.00</b>