No.1/1/2005-R&D
Ministry of New and Renewable Energy
(R&D Coordination Division)

Dated: 18th October 2010

OFFICE MEMORANDUM

Subject: Policy Guidelines of Research, Design, Development, Demonstration(RDD&D) and Manufacture of New and Renewable Energy: Aims, Focus, Manufacturing Areas, Activity, Deployment Aims & Needs, Partners, Monitoring, Committee Composition, Procedure and Guidelines.

1.0 Background

1.1 The R&D Advisory Committee of MNRE had been set up in 1994 for the purpose of giving guidance on the overall direction and quantum of R&D in New and Renewable Energy Sector to be supported in consonance with the aim of "energy self sufficiency". This Committee appraised and recommended over 500 R&D projects to be supported in different institutions across the country. Subsequently, the Ministry through an Office Memorandum No.1/1/2005-R&D dated 12 December 2006 launched a comprehensive programme on Research, Design and Development and Manufacture of New and Renewable Energy including establishment of the Research, Design and Development (RD&D) Project Appraisal Committee(RDPAC) and guidelines for the purpose of appraising and recommending projects for approval of the competent authority focusing attention on areas and activities identified and to work towards aims and purposes stated therein. Around 60 numbers of RD&D projects were recommended till July 2008.

1.2 In order to facilitate faster approvals of R&D projects in line with the revised guidelines of the Ministry of Finance dated 15th November, 2007 for the 11th Plan and a mechanism to take up good quality RD&D projects to achieve the goals set, comprehensive guidelines were issued by the Ministry vide OM of even number and dated 23 July 2008.

1.3 Recently, the government has announced Jawaharlal Nehru National Solar Mission with an objective to establish India as a global leader in solar energy, by creating the policy conditions for its diffusion across the country as quickly as possible. Research & development is envisioned as one of the key elements of the strategy of implementation of the Mission. With a view to have more technology focus and to cater to the needs of Mission, it was decided that the policy guidelines are reviewed and modified. The revised comprehensive policy, procedures and guidelines are described in successive paragraphs.

2.0 Aims

2.1 The need to refocus attention on Research, Design & Development and Demonstration (RDD&D) in new and renewable energy sector has arisen to build policy environment that is effective in mainstreaming new and renewable energy for meeting/supplementing energy supply in the country. The underlying purpose of RDD&D effort is to make industry competitive and renewable energy generation supply self-sustainable/ profitable. Accordingly, RDD&D effort in New and Renewable Energy Sector should lead to its increased share in total energy mix in the country. In

addition, the share of indigenously designed, developed and manufactured new and renewable energy systems/devices has also to be taken into account and consequently monitored for its eventual growth to a dominant position. The international cooperation mechanisms including bilateral and multilateral cooperation frameworks between MNRE and other developed countries established in recent years also need to be utilized for taking up joint research, design and development activities in advanced areas of new and renewable energy.

3.0 Role

3.1 Research, Design & Development, Demonstration and Manufacture of new and renewable energy systems/devices for different applications including transportation, portable and stationary applications for rural, urban, industrial and commercial sectors through:

(i) Technology Mapping and Benchmarking;
(ii) Research, Design, Development, Demonstration and Manufacture needs and facilitate implementation of the same;
(iii) Laying down standards, specifications and performance parameters at par with international levels and facilitate industry in attaining the same;
(iv) Aligning costs of new and renewable energy products and services with international levels and facilitate industry in attaining the same;
(v) Appropriate international level quality assurance accreditation and facilitate industry in obtaining the same;
(vi) Facilitation of industry in becoming internationally competitive.
(vii) Carrying out Renewable Energy Resource Survey, Assessment and Mapping.
(viii) Providing sustained feed-back to manufacturers on performance parameters of new and renewable energy products and services with the aim of effecting continuous upgradation so as to attain international levels in the shortest possible time span;
(ix) Providing cost-competitive new and renewable energy supply options.

4.0 Area Focus

4.1 RDD&D activities would focus on research, design and development that would lead to eventual manufacture of complete systems, even if those activities are required to be shared among different institutions. Thus, there would be a need for system integration broadly covering, interlia, the following areas: -

(i) Alternate Fuels (hydrogen, bio & synthetic) to supplement and eventually substitute liquid hydrocarbons;
(ii) Green Initiative for Future Transport (GIFT) based on Alternate Fuels for land, air & sea applications to supplement and eventually substitute fossil-fuel systems;
(iii) Green Initiative for Power Generation (GIPS) based on Alternate Fuels for stationary & portable power generation applications to supplement and eventually substitute fossil-fuel systems;
(iv) Development of various new and renewable energy systems including high efficiency solar cells and solar cells based on new materials.
(v) Stand alone new and renewable energy products to provide cost-effective energy for cooking, lighting, motive power, drinking water and drying;

(vi) Distributed new and renewable energy systems to provide cost-competitive energy supply options for cooking, lighting and motive power to offset load on the grid;
(vii) New and renewable energy products for urban, industrial and commercial applications, including energy recovery from urban and industrial wastes and effluents to aim at conservation of energy; and
(viii) MW-scale grid interactive renewable electricity systems to contribute towards bridging the gap between fossil fuel based electricity generation supply and demand.

5.0 System Focus

5.1 RDD&D activities shall eventually lead to, interalia, the manufacture of:
(i) Solar Thermal (High Temperature) power generation systems.
(ii) Solar Thermal Urban and Industrial Applications.
(iii) Buildings utilizing renewable energy concepts.
(iv) MW scale SPV Systems.
(v) MW scale wind turbine electric generators for low wind regimes.
(vi) Biogas energy systems and plants for cooking, heating, refrigeration, space cooling, power generation, motive and automotive applications**.**
(vii) Biomass/waste combustion/gasification coupled with IC engines gas turbines and integrated combined cycle systems for co-generation/ trigeneration and setting up Bioenergy-refineries.
(viii) Development of low cost micro hydro equipment
(ix) Simulators for RE grid interactive power stations.
(x) Bio-fuel systems.
(xi) Synthetic fuel systems.
(xii) Hydrogen systems.
(xiii) Hybrid systems.
(xiv) Geothermal and Tidal Energy systems.
(xv) Storage devices, including those for grid power.
(xvi) Any other identified area.

6.0 Activities

6.1 RDD&D activities in new and renewable energy sector shall, interalia, include:
(i) Development of technology, processes, components, sub-systems and systems and standardized test protocols for development and certification purposes of systems and related technologies listed in paragraph 5.0 above.
(ii) Technology validation and demonstration of systems/ devices listed in paragraph 5.0 above, including new and innovative technologies/systems/sub-systems/materials and components.
(iii) Prototype development of systems/ devices listed in paragraph 5.0 above.
(iv) Setting up of Centres of Excellence in thematic areas of research and education
(v) Facilitate manufacture of materials, devices, components and systems for systems/ devices listed in paragraph 5.0 above.
(vi) Raising capacity utilization factor of grid-interactive and distributed power generation systems.
(vii) Lowering cost of new and renewable energy systems/ devices.
(viii) Facilitate setting up R&D infrastructure in PPP mode for any or entire range of activities in any renewable energy technology/application.

7.0 Deployment Aims

7.1 RDD&D activities shall be oriented towards meeting system/ equipment requirement for the following deployment aims:

(i) Grid interactive renewable power: Around 10% grid power installed capacity through renewable power by by 2012 and around 15% by 2032.

(ii) Alternate Fuels – bio-fuels, synthetic fuels and hydrogen: Substitution of upto 10% oil by bio-fuels, synthetic fuels and hydrogen in transport, portable and stationary applications by 2032.

(iii) New and renewable energy in urban areas:
  (a) Energy recovery from municipal waste - in 423 classes-I cities including 107 municipal corporations where suitable waste is available by 2032.
  (b) Solar Water heating systems -100% coverage of all prospective users like hotels, hospitals etc. by 2032.
  (c) 100% coverage of street lighting control systems by solar sensors in all cities - by 2012.

(iv) New and renewable energy in industry:
  (a) Energy recovery from industrial wastes where suitable waste is available across the country – by 2032.
  (b) Solar Water heating systems - 100% coverage of potential industries – by 2032.
  (c) Cogeneration - 100% coverage of potential sugar and other biomass based industry - by 2032.

(v) New and renewable energy in rural areas:
  (a) Provision of lighting/ electricity in around 10,000 remote un-electrified census villages apart from remote hamlets of electrified census villages by 2012.
  (b) Augmentation of cooking, heating, refrigeration, lighting, motive and automotive applications and power generation through renewable energy means in electrified villages by 2032.

8.0 Partners

8.1 RDD&D shall be taken up through the following Partners:

(i) Solely or jointly by Research and Development Institutions; Academic Institutions, Autonomous Institutions.

(ii) Solely or jointly by Developers and Manufacturers of new and renewable energy technologies, processes, materials, components, sub-systems, products and services; in public and private sector;

(iii) A consortia of Indian and foreign companies, led by an Indian company with more than fifty one percent ownership by Indian citizens including NRIs.

(iv) Jointly by a consortia of industry and R&D organizations and institutions

(v) Union Ministries/ Departments/Agencies / PSUs; States/ UTs Government departments/ agencies and institutions funded by Union/ State/ UT Governments, which have adequate infrastructure for taking up R&D.

(vi) Startups having adequate infrastructure

9.0 Monitoring

9.1 The RDD&D effort should, interalia, lead to the following:

9. 1.1 Macro Indicators: Share of:

(i) Alternate fuels in liquid fuel-mix;
(ii) Renewable energy in energy-mix;
(iii) Renewable electricity in electricity-mix; and
(iv) Distributed generation systems using renewable sources.

9.1.2 Micro Indicators: Share of indigenously designed, developed and manufactured:

(i) Vehicles using alternate fuels;
(ii) Pump-sets using alternate fuels;
(iii) Captive generation systems using alternate fuels; (iv) Wind Turbine Electric Generators;
(iv) Solar Photovoltaic systems;
(v) Solar Thermal high temperature systems;
(vi) High pressure gasification systems coupled with high efficiency turbines; (viii) High efficiency micro turbines;
(i) Hybrid Systems;
(ii) Any other included indicator.

10.0 Committee Composition

10.1 In order to facilitate faster approvals of RDD&D project proposals, it has been decided to categorize project proposals in terms of their cost and to set up Committees with different composition for each of the category for appraising and recommending projects for approval of competent authority.

10.2 For the purpose of appraising and recommending projects of budget up to Rs. one crore for approval of the competent authority in all areas of renewable energy except solar energy (solar thermal as well as solar photovoltaics), separate R&D Sectoral Project Appraisal Committees (RDSPACs) are being set up with the following composition:

Sl. No.	Name/ Designation	Status
1.	Concerned Group Head	Chairman
2.	Subject Area Expert	Member
3.	Subject Area Expert (One of the Reviewers)	Member
4.	Director (Finance)	Member
5.	Director (R&D Policy and Coordination)	Member
6.	Concerned Director, MNRE	Member-Secretary

10.3 Keeping in view the need to accelerate RD&D efforts in solar energy technologies, subject experts have a greater role to assist the Ministry in appraisal of the projects and their early approval. Therefore, to meet the specific requirements of R&DD projects in the area of solar thermal and solar photovoltaics especially in view of the challenge of achieving grid parity as announced by the Jawaharlal Nehru National Solar Mission, it has been decided to have the following composition of the R&D Sectoral Project Appraisal Committees (RDSPAC) for the purpose of appraising and recommending R&DD projects of total project cost of up to Rs. five crore in these areas:

Sl. No.	Name/ Designation	Status
1.	Eminent Expert Solar PV: Prof A. K. Barua, Kolkata; Solar Thermal: Prof R. Natarajan, Bangalore	Chairman
2.	Concerned Group Head, MNRE	Co-Chairman
3.	Group Head for R&D Policy and Coordination, MNRE	Member
4.	Subject Area Expert(s)	Member (s)
5.	Subject Area Expert (One of the Reviewers)	Member
6.	Subject Area Expert (One of the Members of the team deputed to visit the Implementing Institution for Project proposals costing more than RS. 1.0 crore)	Member
7.	Director (Finance), MNRE	Member
8.	Concerned Director, MNRE	Member-Secretary

10.4 For the purpose of appraising and recommending RD&D projects beyond the costs of Rs. 5.0 crore for solar thermal and solar photovoltaics and Rs. 1.0 crore for all other areas of renewable energy technologies, separate technology specific RD&D Project Appraisal Committees (RDPACs) in each of the subject areas (viz. solar photovoltaics, solar thermal, new technology, wind, biogas, biomass, bio-fuels, small hydro and waste-to-energy) are being set up with the following composition:

Sl. No.	Name/ Designation	Status
1.	Secretary, MNRE	Chairman#
2.	Financial Adviser, MNRE	Member#
3.	Group Head for R&D Policy and Coordination, MNRE	Member#
4.	Concerned Group Head	Member
5.	Subject Area Expert (In case of solar thermal and Solar photovoltaics, he could be the Chairman of the concerned RDSPACs)	Member
6.	Subject Area Expert (One of the Reviewers)	Member
7.	Subject Area Expert (One of the Members of the team deputed to visit the Implementing Institution)	Member
8.	Concerned Director, MNRE	Member-Secretary

Permanent members on each Committee, while rest of the members would be specific to the subject area.

11.0 Procedure and Guidelines

11.1 Members cannot nominate others to take their place on the RD&D/ Project Appraisal Committees. However, Financial Adviser, MNRE may depute Director (IFD), MNRE as his representative, in case he is pre- occupied. Meetings of the RSPACs and RDPACs would be organized by the respective Groups/ Divisions depending upon the requirements.

11.2 As far as possible, R&D projects should be taken with industry as end-users to ensure that they are involved right from the conception stage of the project. Such projects should clearly quantify outputs that should be challenging and bench- marked to pre-identified aims. In order to make use of the R&D capabilities of the institutions for expansion of new and renewable energy in the country, core R&D Groups/ Centres need to be strengthened so as to take up advanced research involving other institutions and promote new and renewable energy in the country.

11.3 The Group Heads will identify experts in their respective subject areas for seeking comments on the prospective RD&D projects and will get them endorsed by the RDPACs.

11.4 Group Heads shall develop RD&D projects in consultation with the concerned industry/ institution/organizations of civil society including NGOs and may also solicit proposals through advertisements placed in newspapers and/or on the MNRE website. The concerned group in MNRE may also involve an expert R&D organization in evaluating the proposed project so as to generate good quality projects. The revised format, as given in Annexure, will be used for developing and submitting all new R&DD projects to the MNRE. The project proposals which have already been received in the old format will, however, be considered in the same format.

11.5 As and when RD&D proposals are received, the respective Group shall examine the same to ascertain the relevance of the projects in line with the guidelines of MNRE. In case, the proposal is not found relevant or deficient in critical information, the Group will intimate the PI accordingly. In all other cases, the concerned Group would seek comments/recommendations on the proposal from at least three referees. In each case, at least 2 referees should support the project. The measure of support should be considered by a rating of 60% or higher by each of the experts.

11.6 For project proposals with overall cost exceeding Rs. 1.0 crore, an Expert Committee would be deputed to visit the institution proposing the project to have on the spot assessment of the capabilities and capacity of the project team, and also to have an assessment of the available technical and administrative set up at the institution. A presentation would also be made by the PI of the project to the visiting team. The Expert Committee would submit a report to the Ministry for follow up actions.

11.7 In the cases when major changes/revision are suggested, the comments will need to be sent to the Principal Investigator for the revision of the proposal incorporating comments of the experts. The revised proposal shall be sent again to the same experts for final comments.

11.8 The concerned Committees would consider RD&D project proposals and would recommend the same to the competent authority.

11.9 Financial assistance for RD&D projects including the technology validation and demonstration projects that involve partnership with industry/civil society organizations should normally be restricted to 50% of the project cost. However, for any proposal from academic institutions, Government/non-profit research organizations and NGOs, Ministry may provide up to 100% funding. Private academic institutions, especially, engineering colleges will have to furnish a declaration that they do not levy and collect donations for admissions from the students at the time of applying for R & D grants. In case the project is sanctioned by the MNRE and it is subsequently brought to the notice of the MNRE that the

donations are being collected, the grants would be cancelled; the institutions will be required to refund the grant released with interest and such institutions will be banned from getting grants from this Ministry. However, such institutions which get donations can be provided grants up to a maximum 50% of total budget for the project as applicable for industry.

11.10 The Technology Validation and Demonstration Projects involving industry shall generally cover the activities taken up after successful completion of a lab scale/ bench scale work either by industry and/or by lab/ institutions with a view to facilitate field evaluation and demonstration of the product(s), processes, technology, system-integration having potential to lead to their commercialization in the country. These projects may also support technologies sourced from other countries for assessing their suitability and adaptability under Indian conditions.

11.11 In case there is a request from industry for financial support in excess of the percentage indicated in Para 11.9 above and up to a maximum of 75% of the project cost, the same will have to be justified on the basis of expected time horizon for technological maturity and commercialization and its long-term cost competitiveness.

11.12 Ministry may provide up to 100% financial assistant as core support to R & D institutions for setting up specialized Centres of Excellence in the area of renewable energy on the basis of recommendations of RDSPAC/RDPAC as the case may be.

11.13 In order to facilitate procurement of equipment early, upto 50% of the total assistance minus institutional charges/overheads would be released initially along with the sanction depending on the requirements of equipment in the project. For projects where equipment cost exceeds 50% of the project cost, higher initial release may be considered by the Ministry. The balance assistance minus institutional charges/Overheads would be sanctioned as per yearly allocation based on achievement of aims and progress of implementation of the project. The final payment i.e. institutional charges/ overheads would be released only after successful completion of the project and review by a Monitoring Committee and on receipt of project completion report.

11.14 Projects having approved project cost of more than ` 1.0 crore on completion will be presented to the respective Appraisal Committees. Completed project reports shall be posted on MNRE website and hard copy will be placed in the Library.

11.15 For all projects that are approved by the Ministry, the concerned Group/ Division shall issue the sanction order and make all releases of financial assistance as per the policy guidelines. The project grant shall be utilized as per the "general terms & conditions of the grant for R&D/technology development project" as per revised Annexure, and the same be enclosed with sanction order for compliance. Copies of all sanction orders would be endorsed to R&D Policy and Coordination Division with a view to have consolidation of the information.

11.16 TA/DA as per entitlement and a sitting fee shall be provided to the members of the RDSPAC/RDPAC at the rate which would be decided as per separate sanction order.

11.17 Policy guidelines will be issued by the R&D Policy and Coordination Group in the MNRE and the database on all the projects sanctioned by the Ministry will continue to be dealt by the Group. The Concerned Groups will develop the RD&D project proposals and process them for their appraisal including organizing meetings of the Committees and issuing approved minutes etc.

12.0 Monitoring of Implementation of the RD&D Projects

12.1 For all projects, a third party monitoring mechanism shall be introduced to ensure timely execution and achievement of deliverables and also to allow any mid course correction, if desired. For this, a panel of experts and organizations would be identified by the concerned Group/Division in the Ministry in consultation with the concerned RDPACs and with the approval of Secretary, MNRE. The expert / organization for monitoring purposes shall be identified at the time of consideration of the proposal by RDSPACs/ RDPACs. Each project would be required to be visited at least once in a year, and a report on the status of activities and achievements vis-à-vis. the sanctioned objectives/ deliverables and milestones would be prepared and submitted to the Ministry.

12.2 Depending upon the requirements of the project, one expert or a group of experts or an institution shall be assigned the task of monitoring. In case of more than one expert, the coordinating expert would be named at the time of assigning the monitoring work, and other experts will be selected by him in consultation with the Ministry. The designated monitors would be encouraged to have regular interaction with the project team with a view to have continuous updation on the progress and also to guide the project team on matters related to implementation, if required.

12.3 To ensure effective and quality implementation of the monitoring process, remuneration will be provided to each expert for each report, subject to a maximum of two in a year, along with TA/DA as per entitlement. In case of more than one expert, the remuneration would be provided at the same rate to each of the experts. In case of an organization being selected for the task of monitoring, the costs related to overheads and other miscellaneous expenses shall also be provided. The rate of remuneration to experts and the costs to institutions would be decided as per separate sanction order. Consultants with suitable background, wherever available, may also be engaged for monitoring purposes by the Ministry as per available government guidelines/procedures.

12.4 The Government/Semi-Government/Autonomous bodies may also be engaged in monitoring work by establishing a special cell in their organizations for this purpose. Such organizations shall be identified by the concerned Groups in the MNRE clearly highlighting the core strength and having no conflict of interest with the stakeholders. The proposals from such identified bodies would be got developed by the concerned Groups and will be submitted to the Concerned RDPACs for their recommendations.

12.5 For all projects under implementation, the monitoring mechanism, if not already in place, would also be introduced as per policy guidelines contained herein.

12.6 The concerned Groups in the MNRE shall provide the relevant documents including a copy of the project proposal and the sanction order to the designated monitors to facilitate the monitoring work.

13.0 IPR and Technology Transfer Issues

13.1 The grantee organization(s)/ Inventor(s) are required to seek protection of Intellectual Property Rights for the results/ output of the sanctioned RD&D projects and shall share royalty/ proceeds of sale of IPR in accordance with the guidelines given below:

i) The Government shall have a royalty-free license/ marching right for the use of the Intellectual Property for the purposes of the Government of India and

this Ministry reserves the right to require the institution and the industry to license others and that anyone exclusively licensed to market the innovation in India, must manufacture the product in India.

ii) In case MNRE files patents (when grantee organization is unable to file a patent) any earnings accruing from transfer and commercialization shall be shared equally by this Ministry with the Institution and the generator of the Intellectual Property. However, wherever the expected earnings are above Rs 10 lakh, the proportion of sharing can be 40% for the institution, 40% for this Ministry and 20% to the generator of Intellectual Property.

iii) The grantee organization(s) is permitted to retain the benefits arising out of the IPR. In case of more than one institution, IPR generated through joint research can be owned jointly by them as may be mutually agreed to by them through a written agreement.

iv) The institution and industry may transfer the technology to another industry for commercialization, on terms and conditions as may be mutually agreed upon, on non-exclusive basis under intimation to MNRE. Any earnings accruing from such a transfer and commercialization shall be shared between the institution and the industry as may be mutually agreed to. The details of the agreement, amounts-received, annual sales turnover of the product shall be intimated periodically to this Ministry.

v) In case of projects supported solely to industry, any earnings arising out of sale/transfer of IPR generated through the MNRE supported project shall be shared between the MNRE and the industry in the ratio of their individual shares of the project cost.

vi) Other terms and conditions regarding IPR issues shall be in accordance with the guidelines contained in the DST circular issued with the concurrence of Ministry of Finance, Department of Expenditure vide their O.M. No.33(5)PF-II99, dated 22nd February, 2000 or subsequent circulars which may be issued by DST/ MOF on the subject (Annexure-XV of 'R&D Formats' on home page of the Ministry (www.mnre.gov.in).

14. This issues with the approval of Minister of New and Renewable Energy.

(Dr. B.S.Negi)
Director (R&D)

To

All Officers in MNRE Hqrs. and its Regional Offices.

Copy to:

1. The Secretary, Department of Science & Technology, Technology Bhavan, New Mehrauli Road, New Delhi.
2. The Secretary, DSIR and Director General, Council of Scientific and Industrial Research, Rafi Marg, New Delhi.

3. The Secretary, Department of Bio-technology, Block 2, CGO Complex, New Delhi.
4. The Secretary, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
5. The Secretary, Department of Ocean Development, New Delhi.
6. The Secretary, Department of Atomic Energy, 145-A, South Block, New Delhi.
7. The Secretary, Department of Space, 3rd floor, Lok Nayak Bhawan, New Delhi.
8. The Secretary, Department of Information Technology, Electronics Niketan, New Delhi.
9. The Secretary, Department of Agriculture Research, New Delhi.
10. AS&FA, MNRE, New Delhi.
11. All Group Heads, MNRE, New Delhi.
12. Sr. PPS to Secretary, MNRE, New Delhi.
13. PS to Minister (NRE), New Delhi.
14. The CMD, Indian Renewable Energy Development Agency(IREDA), New Delhi.
15. Master File, R&D Division, MNRE, New Delhi.

(Dr. B.S.Negi)
Director (R&D)

File No. 1/1/2005-R&D
Ministry of New and Renewable Energy
TI FAD and R&D Division

Block No. 14, CGO Complex,
Lodi Road. New Delhi-I 10003.
Dated: 17.03.2009

CORRIGENDUM

Subject: Policy Guidelines of Research, Design, Development, Demonstration (RDD&D) and Manufacture of New and Renewable Energy: Aims, Focus, Manufacturing Areas, Activity, Development Aims & Needs, Partners, Monitoring, Committee Composition, Procedure and Guidelines.

The following change is made to this Ministry's 0111cc Memorandum of even number dated 23 July, 2008 regarding the subject cited above.

In para 11.6 (4th sentence)

For: "The measure of support should be considered by average of overall rating of required number of experts which should not be less than 80D/0".

Read: "The measure of support should be considered by average of overall rating of required number of experts which should not be less than 60%".

2. Other terms and conditions of the said Office Memorandum remain the same.

3. This issues with the approval of Secretary, MNRE.

(Dr. B.S.Negi)
Director (R&D)

To
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(Dr. B.S.Negi)
Director (R&D)

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(R&D Coordination Division)

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The R&D Advisory Committee of MNRE had been set up in 1994 for the purpose of giving guidance on the overall direction and quantum of R&D in New and Renewable Energy Sector to be supported in consonance with the aim of "energy self sufficiency". This Committee appraised and recommended over 500 R&D projects to be supported in different institutions across the country. Subsequently, the Ministry through an Office Memorandum No.1/1/2005-R&D dated 12th December 2006 launched a comprehensive programmee on Research, Design and Development and Manufacture of New and Renewable Energy including establishment of the Research, Design and Development(RD&D) Project Appraisal Committee(RDPAC) and guidelines for the purpose of appraising and recommending projects for approval of the competent authority focusing attention on areas and activities identified and to work towards aims and purposes stated therein. Around 60 numbers of RD&D projects have been recommended till July 2008.

2. It is imperative to put in place comprehensive guidelines which facilitate faster approvals of projects in line with the revised guidelines of the Ministry of Finance dated the 15th November, 2007 for the 11th Plan and a mechanism to take up good quality RD&D projects to achieve the goals set. Further, in order to give impetus to demonstration of indigenously developed technologies in specific areas of new and renewable energy, it is essential to establish within the guidelines a mechanism for the purpose of appraising and recommending projects for demonstration. In addition, in order to develop and strengthen institutions with expertise in specific areas core funding for taking up advanced research and development needs to be provided for technology development. The revised comprehensive policy, procedures and guidelines are described in successive paragraphs.

2.0 Aims

2.1 The need to refocus attention on Research, Design & Development and Demonstration (RDD&D) in new and renewable energy sector has arisen to build policy environment that is effective in mainstreaming new and renewable energy for meeting/supplementing energy supply in the country. The underlying purpose of

Contd.2

RDD&D effort is to make industry competitive and renewable energy generation supply self-sustainable/ profitable. Accordingly, RDD&D effort in New and Renewable Energy Sector should lead to its increased share in total energy mix in the country. In addition, the share of indigenously designed, developed and manufactured new and renewable energy systems/devices has also to be taken into account and consequently monitored for its eventual growth to a dominant position. The international cooperation mechanisms including bilateral and multilateral cooperation frameworks between MNRE and other developed countries established in recent years also need to be utilized for taking up joint research, design and development activities in advanced areas of new and renewable energy.

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(ix) Providing cost-competitive new and renewable energy supply options.

4.0 Area Focus

4.1 RDD&D activities would focus on research, design and development that would lead to eventual manufacture of complete systems, even if those activities are required to be shared among different institutions. Thus, there would be a need for system integration broadly covering, interlia, the following areas: -

(i) Alternate Fuels (hydrogen, bio & synthetic) to supplement and eventually substitute liquid hydrocarbons;
(ii) Green Initiative for Future Transport (GIFT) based on Alternate Fuels for land, air & sea applications to supplement and eventually substitute fossil-fuel systems;

Contd.3

(iii) Green Initiative for Power Generation (GIPS) based on Alternate Fuels for stationary & portable power generation applications to supplement and eventually substitute fossil-fuel systems;

(iv) Development of various new and renewable energy systems including high efficiency solar cells and solar cells based on new materials.

(v) Stand alone new and renewable energy products to provide cost-effective energy for cooking, lighting, motive power, drinking water and drying;

(vi) Distributed new and renewable energy systems to provide cost-competitive energy supply options for cooking, lighting and motive power to offset load on the grid;

(vii) New and renewable energy products for urban, industrial and commercial applications, including energy recovery from urban and industrial wastes and effluents to aim at conservation of energy; and

(viii) MW scale grid interactive renewable electricity systems to contribute towards bridging the gap between fossil fuel based electricity generation supply and demand.

5.0 System Focus

5.1 RDD&D activities shall eventually lead to, interalia, the manufacture of:

(i) Solar Thermal (High Temperature) power generation systems.
(ii) Solar Thermal Urban and Industrial Applications.
(iii) Buildings utilizing renewable energy concepts.
(iv) MW scale SPV Systems.
(v) MW scale wind turbine electric generators for low wind regimes.
(vi) Biogas energy systems and plants for cooking, heating, refrigeration, space cooling, power generation, motive and automotive applications.
(vii) Biomass/waste combustion/gasification coupled with IC engines gas turbines and integrated combined cycle systems for co-generation/ trigeneration and setting up Bioenergy-refineries.
(viii) Development of low cost micro hydro equipment
(ix) Simulators for RE grid interactive power stations.
(x) Bio-fuel systems.
(xi) Synthetic fuel systems.
(xii) Hydrogen systems.
(xiii) Hybrid systems.
(xiv) Geothermal and Tidal Energy systems.
(xv) Storage devices, including those for grid power.
(xvi) Any other identified area.

6.0 Activities

6.1 RDD&D activities in new and renewable energy sector shall, interalia, include:

(i) Development of technology, processes, components, sub-systems and systems and standardized test protocols for development and certification purposes of systems listed in paragraph 5.0 above.

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(ii) Technology demonstration of systems/ devices listed in paragraph 5.0 above.

(iii) Prototype development of systems/ devices listed in paragraph 5.0 above.

(iv) Facilitate manufacture of systems/ devices listed in paragraph 5.0 above.

(v) Raising capacity utilization factor of grid-interactive and distributed power generation systems.

(vi) Lowering cost of new and renewable energy systems/ devices.

7.0 Deployment Aims

7.1 RDD&D activities shall be oriented towards meeting system/ equipment requirement for the following deployment aims:

(i) Grid interactive renewable power:

Around 10% grid power installed capacity through renewable power by by 2012 and around 15% by 2032.

(ii) Alternate Fuels – bio-fuels, synthetic fuels and hydrogen:

Substitution of upto 10% oil by bio-fuels, synthetic fuels and hydrogen in transport, portable and stationary applications by 2032.

(iii) New and renewable energy in urban areas:

(a) Energy recovery from municipal waste - in 423 class-I cities including 107 municipal corporations where suitable waste is available – by 2032.

(b) Solar Water heating systems -100% coverage of all prospective users like hotels, hospitals etc. by 2032.

(c) 100% coverage of street lighting control systems by solar sensors in all cities - by 2012.

(iv) New and renewable energy in industry:

(a) Energy recovery from industrial wastes where suitable waste is available across the country – by 2032.

(b) Solar Water heating systems - 100% coverage of potential industries – by 2032.

(c) Cogeneration - 100% coverage of potential sugar and other biomass based industry - by 2032.

(v) New and renewable energy in rural areas:

(a) Provision of lighting/ electricity in around 10,000 remote un-electrified census villages apart from remote hamlets of electrified census villages – by 2012.

(b) Augmentation of cooking, heating, refrigeneration, lighting, motive and automotive applications and power generation through renewable energy means in electrified villages – by 2032.

Contd.5

8.0 Partners

8.1 RDD&D shall be taken up through the following Partners:

(i) Research and Development Institutions; Academic Institutions, Autonomous Institutions.
(ii) Developers and Manufacturers of new and renewable energy technologies, processes, materials, components, sub-systems, products and services; in public and private sector; and
(iii) Union Ministries/ Departments/Agencies/PSUs; States/UTs government departments/agencies; financial institutions, local bodies; panchayats; community based and organizations of civil societies such as nongovernmental organizations; and citizens and institutions funded by Union/ State/ UT Governments.

9.0 Monitoring

9.1 The RDD&D effort should, interalia, lead to the following:

9. 1.1 Macro Indicators
Share of:
(i) Alternate fuels in liquid fuel-mix;
(ii) Renewable energy in energy-mix;
(iii) Renewable electricity in electricity-mix; and
(iv) Distributed generation systems using renewable sources.

9.1.2 Micro Indicators
Share of indigenously designed, developed and manufactured:
(i) Vehicles using alternate fuels;
(ii) Pump-sets using alternate fuels;
(iii) Captive generation systems using alternate fuels;
(iv) Wind Turbine Electric Generators;
(v) Solar Photovoltaic systems;
(vi) Solar Thermal high temperature systems;
(vii) High pressure gasification systems coupled with high efficiency turbines;
(viii) High efficiency micro turbines;
(ix) Hybrid Systems;
(x) Any other included indicator.

10. Committee Composition

10.1 In order to facilitate faster approvals of RDD&D/Technology Demonstration (TD) project proposals, it has been decided to categorize project proposals in terms of cost and nature of the projects with different composition of Committees for appraising and recommending projects for approval of competent authority. This process has been designed so as to expedite approval of projects of different kinds with proper appraisal.

Contd.6

10.1.1 For the purpose of appraising and recommending projects of budget up to Rs. one crore for approval of the competent authority an R&D Sectoral Project Appraisal Committee (RDSPAC) to focus attention on areas and activities listed in paragraphs 5.0 and 6.0 above and to work towards aims and purposes stated in paragraph 2.0 above is being set up with the following composition:

Sl. No.	Name/ Designation	Status
1.	Secretary, MNRE	Chairman#
2.	Financial Adviser, MNRE	Member
3.	Concerned Group Head(s)	Member
4.	Group Head (R&D), MNRE	Member
5.	Group Head(P&C and IR), MNRE	Member
6.	Director(R&D), MNRE	Member-Secretary

The concerned Group Head may invite an industry representative and/or an expert from R&D institution as special invitees depending on the nature of the project.

10.1.2 For the purpose of appraising and recommending projects of budget more than Rs. one crore for approval of the competent authority an RD&D Project Appraisal Committee (RDPAC) to focus attention on areas and activities listed in paragraphs 5.0 and 6.0 above and to work towards aims and purposes stated in paragraph 2.0 above is being set up with the following composition:

Sl. No.	Name/ Designation	Status
1.	Secretary, MNRE	Chairman#
2.	Financial Adviser, MNRE	Member
3.	Group Head (R&D), MNRE	Member
4.	Group Head(P&C and IR), MNRE	Member
5.	Representative of DST: Dr. V. Rao Aiyagari, Adviser, DST, New Delhi	Member
6.	Representative of CSIR: Dr. A.K. Shukla, Director, CECRI, Karaikuri	Member
7.	Dr. Vikram Kumar, Director, NPL, New Delhi	Member
8.	Dr. P. Ghosh, Director, CSMCRI, Bhavnagar	Member
9.	Dr. A. R. Upadhya, Director, NAL, Bangalore	Member
10.	Dr. R. Natarajan, Former Chairman AICTE, Bangalore	Member
11.	Dr. R. K. Khandal, Director, Shriram Institute for Industrial Research, Delhi	Member
12.	Divisional Head (R&D), MNRE	Member-Secretary

#Chairman may invite industry representatives as special invitees depending on the nature of the project.

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10.1.3 For the purpose of appraising and recommending projects on technology demonstration preceding commercialization in specific areas, for approval of the competent authority a Technology Demonstration Project Appraisal Committee(TDPAC) to focus attention on activities listed in paragraphs 5.0 and 6.0 above and to work towards aims and purposes stated in paragraph 2.0 above is being set-up with the following composition:

Sl.No.	Name/Designation	Status
1.	Secretary, MNRE	Chairman
2.	Financial Adviser, MNRE	Member
3.	Group Head(R&D), MNRE	Member
4.	Group Head(P&C and IR), MNRE	Member
5.	Group Head(concerned project area), MNRE	Member
6&7.	Two Experts in each subject matter to be drawn from the following Expert Panel*: **Solar energy-** **Solar Thermal** 1 Prof. J.K.Nayak, IIT Bombay 2 Prof.T.C.Kandpal, IIT Delhi **Solar Photovoltaic** 1. Dr.A.K.Barua, IACS, Kolkata 2. Dr.S.K.Kacker, CEL, Sahibabad. **Wind Energy-** 1. Dr.J. Issac, NAL, Bangalore 2. Prof.S.A.Kharparde, Deptt. of Elect. Engg., IIT Mumbai. **SHP-** 1. Shri Arun Kumar, AHEC, IIT Roorkee. 2. Shri Gurdial Singh, Member Hydro, CEA, New Delhi. **Bio-energy-** 1. Dr.A.K.Kurchania, Maharana Pratap University of Agriculture & Technology, Udaipur 2. Dr.R.Sethumadhavan,Institute for Energy Studies, Anna University, Chennai. **Bio-fuel-** 1. Dr.D.K.Tuli, CEO, Indian Oil Technologies Ltd. And GM, IOC, R&D centre, Faridabad. 2. Dr. P. K. Raichaudhury, IIT, New Delhi. **Waste to Energy-** 1. Prof. Surendra Kumar, IIT Roorkee. 2. Dr.Y.P.Abbi, TERI, New Delhi. **New Technology-** 1. Prof. O.N.Shrivastava, BHU, Varanasi.-Hydrogen & Fuel Cell. 2. Prof. B.Vishwanathan, IIT Madras, Chennai-Hydrogen and Fuel Cell. 3. Dr. Deva Dutta Das, IIT Roorkee-Tidal Energy. 4. Dr.T.Harinarayana, NGRI, Hyderabad-Geothermal 5. Dr.G.N.Srinivasan, CECRI, Kaiarakuudi-BOV.	Member
8.	MD, National Research Development Corporation(NRDC)/Representative of NRDC	Member
9.	CMD, Indian Renewable Energy Development Agency(IREDA).	Member
10.	Representative of Industry association.	Member
11.	Divisional Head(R&D), MNRE	Member-Secretary

*The Expert Panel shall be drawn/modified in consultation with the concerned Group Heads with approval of Secretary, MNRE.

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11. Procedure and Guidelines

11.1 Members cannot nominate others to take their place on the RD&D/TD Project Appraisal Committees. However, Financial Adviser, MNRE may depute Director (IFD), MNRE as his representative, in case he is otherwise pre-occupied. Group Heads, MNRE shall be permanent invitees.

11.2 R&D projects may be taken up by Universities, research institutions, R&D laboratories and industry, individually or as a consortium. As far as possible, R&D projects should be taken with industry as end-users to ensure that they are involved right from the conception stage of the project. Such projects should clearly quantify outputs that should be challenging and bench- marked to pre-identified aims. In order to make use of the R&D capabilities of the institutions for expansion of new and renewable energy in the country core R&D Groups/ Centres need to be strengthened so as to take up advanced research involving other institutions and promote new and renewable energy in the country.

11.3 The technology demonstration (TD) projects aim at promoting Industry's drive to take up projects for demonstration leading to commercialization of technology in new and renewable energy sector. These TD projects should aim at demonstration of technology and making it bankable. The financial assistance for TD has the following objectives:

(a) To forge industry-institute cooperation
(b) To strengthen the National Innovation capability for market Development.

11.4 The Group Heads will identify experts in their respective subject areas for seeking comments on the prospective RD&D/TD projects and will forward the bio-data of the experts identified to R&D Coordination Division for consideration of the RDPAC/TDPAC. If necessary, comments from experts outside the country may also be taken. Comments of outside experts may be used to substantiate the proposed RDD&D programmee. The RDD&D Appraisal Committee shall draw up a list of sector specialists/referees, who have no conflict of interest either directly or indirectly with the project proposal that is to be referred to them. The duration of Panel of Experts will be initially for one year which may be extended further. Consolidated guidelines for TA/DA and sitting fee/evaluation fee to members of the RDPAC/TDPAC and evaluation fee for Experts from within the country for offering comments is being issued separately.

11.5 Group Heads shall develop RD&D/TD projects in consultation with the concerned industry/ institution/organizations of civil society including NGOs and solicit proposals through advertisements placed in newspapers and on the MNRE website. The concerned group of MNRE may involve an expert R&D organization in evaluating the proposed project so as to generate good quality projects.

11.6 As and when RD&D/TD proposals are received, the respective Group shall examine the same to ascertain the relevance of the projects in line with the

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guidelines of MNRE. Depending on relevance, the Group Head shall refer the proposal to at least three referees up to Rs. 5 crore and five referees for proposals exceeding Rs.5 crore. In each case at least 2 or 3 referees, respectively, should support the project. The measure of support should be considered by average of overall rating of required number of experts which should not be less than 80%. In the cases when the experts in their comments suggested major changes/revision, the comments will need to be sent to Principal Investigator for revision of the proposal incorporating comments of experts. The revised proposal shall be sent again to the same experts for final comments. Only project proposals in prescribed format with final comments of requisite number of experts will be considered for placing before the RDPAC/TDPAC.

11.7 Group Heads shall forward RD&D/TD project proposals including comments of experts empanelled by Ministry to the Member-Secretary in prescribed formats (available on the website of the Ministry) for inclusion in the Agenda.

11.8 The Member-Secretary shall place only those RD&D/TD project proposals received from Group Heads which are in the prescribed format supported by requisite experts comments before the RD&D/TD Project Appraisal Committee for consideration.

11.9 The concerned Committee would consider RD&D/TD proposals, irrespective of financial outlay, and would recommend the same to the competent authority as per current delegation of powers vide Ministry of Finance's relevant circulars.

11.10 In order to expedite the process of approval, the RD&D/TD projects with budgetary requirements of less than Rs. one crore will be processed by the concerned Group and will be considered for recommendation by an RD&D Sectoral Project Appraisal Committee(RDSPAC). The proposals will be processed by the respective Groups and will be forwarded to Member Secretary, RDPAC/TDPAC for consideration of the concerned Committee provided requisite comments of experts have been obtained in support of the proposal by the concerned Group. Such projects will be placed before RDPAC as and when convened for information. All projects with budgetary requirements of more than Rs. one crore will be placed before RDPAC/TDPAC for recommending for approval of the competent authority.

11.11 Financial assistance for RD&D/TD projects that involve partnership with industry/civil society organizations should normally be restricted to 50% of the project cost. However, for any proposal from Universities, Government research institutions, private educational institutions, etc. Ministry may provide upto100% funding, depending on project priority. In the case of private educational institutions especially engineering colleges have to furnish a declaration that they do not levy and collect donations for admissions from students while applying for R & D grants. In case it is brought to light subsequently that such donations are being collected, the grants would be cancelled, the institutions will have to refund the grant with interest and their institutions would be banned from getting grants from this Ministry. However, such institutions which get donations can be provided

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grants upto a maximum 50% of total budget for the project as applicable for industry.

11.12 The Technology Demonstration Projects involving industry shall generally cover the activities taken up after successful completion of a lab scale/ bench scale work either by industry and/or by lab/ institutions till completion of Technology development and demonstration of the product(s), processes, technology/system-integration projects developed as commercially produce-able prototypes/or at a pilot/demonstration scale before further commercialization of that technology.

11.13 The Technology Demonstration Projects shall be implemented with IREDA as the nodal Financial Institution for the purpose. 25% of the share of MNRE shall be released to IREDA as first installment and thereafter it would be based on projected requirements in accordance with the progress of implementation. IREDA being a financial institution has an advantage of counterpart funding as loan to the promoter, if required. The service charges/ institutional charges along with expenses for publicity, documentation and monitoring should not exceed 10% of the cost of the project grant. Such projects can also be taken up by R&D institutions/ organizations in association with industry with implementation mechanism finalized between the two even without financing from IREDA.

11.14 In case there is a request from industry for financial support in excess of the percentage indicated in Para 11.11 above, the same will have to be justified on the ground that the time horizon for technological maturity and for developing long-term competitiveness at large.

11.15 Ministry may provide up to 100% financial assistant as core support to R & D institutions for setting up specialized Centres of excellence in the area of renewable energy on the basis of recommendations of RDPAC. MoU needs to be signed by the institution for setting up a multi-faculty drawn from the relevant Departments of the institutions on the basis of defined objectives and accountability for the deliverables. A Monitoring Committee under the chairmanship of Secretary, MNRE shall be formed for the purpose, especially to monitor support from Industry/State Government/Institution in terms of Revenue generating modalities to ensure sustainability.

11.16 In order to facilitate procurement of equipment early, upto 50% of the total assistance minus institutional charges/overheads would be released initially along with the sanction depending on the requirements of equipment in the project. The balance assistance minus institutional charges/Overheads would be sanctioned as per yearly allocation based on achievement of aims and progress of implementation of the project.The final payment i.e. institutional charges/ overheads would be released only after successful completion of the project and review by a Monitoring Committee and on receipt of project completion report.

11.17 Projects of up to Rs. one crore on completion will be presented to the Sectoral Committee for achievements. Projects of more than Rs. one crore will be presented to RDPAC/TDPAC.

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11.18 For all projects that are approved by the Ministry, the concerned Group/ Division shall issue the sanction and make all releases of financial assistance on achievement of milestones from a relevant common budget head. Copies of all such sanctions would be sent to all the Group Heads, the Member-Secretary and IF Division.

11.19 In order to ensure timely execution and achievement of deliverables a third party monitoring mechanism may be introduced and for the purpose 2% of the cost of the project (with the cap of Rs.10.0 lakh) to be provided to an expert R & D institution/ organization identified by the concerned group of the Ministry. The identified institution shall monitor the project(s) in association with an expert preferably who has appraised the project and provide necessary documents and inputs for the successful closure of the project, in addition to internal monitoring by the Ministry by contracting Research Associates.

11.20 Completed project reports along with an evaluation note of the Committee shall be placed in the Library after certification by the Member-Secretary.

11.21 TA/DA and sitting fee to the members of the RDSPAC/RDPAC/TDPAC shall be provided. The subject matter experts involved in the evaluation of the RD& D/TD projects shall also be provided appraisal/evaluation fee. The payment shall be made from the budget heads of administration/concerned programme.

12. IPR and Technology Transfer Issues

12.1 The grantee organization(s)/ Inventor(s) are required to seek protection of Intellectual Property Rights for the results/ output of the sanctioned RD&D/TD projects and shall share royalty/ proceeds of sale of IPR in accordance with the guidelines given below:

i) The Government shall have a royalty-free license/ marching right for the use of the Intellectual Property for the purposes of the Government of India and this Ministry reserves the right to require the institution and the industry to license others and that anyone exclusively licensed to market the innovation in India, must manufacture the product in India.

ii) In case MNRE files patents (when grantee organization is unable to file a patent) any earnings accruing from transfer and commercialization shall be shared equally by this Ministry with the Institution and the generator of the Intellectual Property. However, wherever the expected earnings are above Rs 10 lakh, the proportion of sharing can be 40% for the institution, 40% for this Ministry and 20% to the generator of Intellectual Property.

iii) The grantee organization(s) is permitted to retain the benefits arising out of the IPR provided 1/3rd of the actual earnings is paid to the inventor(s)/generator(s) of Intellectual Property and not less than 25% of such earnings is credited into a fund called 'Patent Fund'. The 'Patent Fund' should be utilized by the institution for renewal of the patent, protection of rights against infringements, for creating awareness and building competency on IPR and related issues and filing of new patents.

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iv) If the patent is taken jointly by the institution, MNRE and industry and if the industry has contributed at least one-third of the project cost, the industry (and its associate) shall have the first right to commercialize the innovation, without paying any royalty, within one year of the completion of the project. The industry shall have exclusive right to commercialize for another two years after paying royalty. Subsequently, the technology can be transferred to any other industry for commercialization.

v) The institution and industry may transfer the technology to another industry for commercialization, on terms and conditions as may be mutually agreed upon, on non-exclusive basis under intimation to MNRE. Any earnings accruing from such a transfer and commercialization shall be shared between the institution and the industry as may be mutually agreed to. The details of the agreement, amounts-received, annual sales turnover of the product shall be intimated periodically to this Ministry.

13. This issues with the approval of Minister of New and Renewable Energy.

(Dr. B.S.Negi)
Director (R&D)

To

All Officers in MNRE Hqrs. and its Regional Offices.

Copy to:

1. The Secretary, Department of Science & Technology, Technology Bhavan, New Mehrauli Road, New Delhi.
2. The Secretary, DSIR and Director General, Council of Scientific and Industrial Research, Rafi Marg, New Delhi.
3. The Secretary, Department of Bio-technology, Block 2, CGO Complex, New Delhi.
4. The Secretary, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
5. The Secretary, Department of Ocean Development, New Delhi.
6. The Secretary, Department of Atomic Energy, 145-A, South Block, New Delhi.
7. The Secretary, Department of Space, 3rd floor, Lok Nayak Bhawan, New Delhi.
8. The Secretary, Department of Information Technology, Electronics Niketan, New Delhi.
9. The Secretary, Department of Agriculture Research, New Delhi.
10. AS&FA, MNRE, New Delhi.
11. All Group Heads, MNRE, New Delhi.
12. Sr. PPS to Secretary, MNRE, New Delhi.
13. PS to Minister (NRE), New Delhi.
14. The CMD, Indian Renewable Energy Development Agency(IREDA), New Delhi.
15. Master File, R&D Division, MNRE, New Delhi.

(Dr. B.S.Negi)
Director (R&D)

File No.1/1/2005-R&D
Ministry of Non-conventional Energy Sources
(R&D Division)

Dated:12th December, 2006

OFFICE MEMORANDUM

Subject: Research, Design & Development and Manufacture of New and Renewable Energy: Aims, Focus, Manufacturing Areas, Activity, Deployment Aims & Needs, Partners, Monitoring, Committee Composition, Procedure an Guidelines

The R&D Advisory Committee of MNES had been set up in 1994 for the purpose of giving guidance on the overall direction and quantum of R&D in New and Renewable Energy Sector to be supported in consonance with the aim of "energy self sufficiency". This Committee appraised and recommended over 500 R&D projects to be supported in different institutions across the country.

2.0 Aims

2.1 The need to refocus attention on Research, Design & Development (RD&D) has arisen. The underlying purpose of RD&D effort is to make industry competitive. A comprehensive statistic that measures competitiveness is net foreign exchange earning. Accordingly, RD&D effort has to make the country a net foreign exchange earner in the New and Renewable Energy Sector. In addition, the share of indigenously designed, developed and manufactured new and renewable energy systems/ devices has also to be taken into account and consequently monitored for its eventual growth to a dominant position.

3.0 Role

3.1 Research, Design & Development and Manufacture of new and renewable energy systems/ devices for transportation, portable and stationary applications for rural, urban, industrial and commercial sectors through:

(i) Technology Mapping and Benchmarking;
(ii) Research, Design, Development and Manufacture needs and facilitate implementation of the same;
(iii) Laying down standards, specifications and performance parameters at par with international levels and facilitate industry in attaining the same;
(iv) Aligning costs of new and renewable energy products and services with international levels and facilitate industry in attaining the same;
(v) Appropriate international level quality assurance accreditation and facilitate industry in obtaining the same;
(vi) Facilitation of industry in becoming internationally competitive and a net foreign exchange earner especially through (ii) to (v) above and related measures;

(vii) Carrying out Renewable Energy Resource Survey, Assessment and Mapping.
(viii) Providing sustained feed-back to manufacturers on performance parameters of new and renewable energy products and services with the aim of effecting continuous upgradation so as to attain international levels in the shortest possible time span;
(ix) Providing cost-competitive new and renewable energy supply options.

4.0 Area Focus

4.1 Activities would focus on research, design and development that would lead to eventual manufacture of complete systems, even if those activities are required to be shared among different institutions. Thus, there would be a need for system integration broadly covering the following areas: -

(i) Alternate Fuels (hydrogen, bio & synthetic) to supplement and eventually substitute liquid hydrocarbons;
(ii) Green Initiative for Future Transport (GIFT) based on Alternate Fuels for land, air & sea applications to supplement and eventually substitute fossil-fuel systems;
(iii) Green Initiative for Power Generation (GIPS) based on Alternate Fuels for stationary & portable power generation applications to supplement and eventually substitute fossil-fuel systems;
(iv) Standalone new and renewable energy products to provide cost-effective energy for cooking, lighting and motive power;
(v) Distributed new and renewable energy systems to provide cost-competitive energy supply options for cooking, lighting and motive power to offset load on the grid;
(vi) New and renewable energy products for urban, industrial and commercial applications, including energy recovery from urban and industrial wastes and effluents to aim at conservation of energy; and
(vii) MW scale grid interactive renewable electricity systems to contribute towards bridging the gap between fossil fuel based electricity generation supply and demand.

5.0 System Focus

5.1 RD&D activities shall eventually lead to the manufacture of:

(i) Solar Thermal (High Temperature) power generation systems.
(ii) Solar Thermal Urban and Industrial Applications.
(iii) Buildings utilizing renewable energy concepts.
(iv) MW scale SPV Systems.
(v) MW scale wind turbine electric generators for low wind regimes.
(vi) Biomass gasification coupled with gas turbines and integrated combined cycle system.
(vii) Simulators for RE grid interactive power stations.
(viii) Bio-fuel systems.
(ix) Synthetic fuel systems.

(x) Hydrogen systems.
(xi) Hybrid systems.
(xii) Geothermal and Tidal Energy systems.
(xiii) Storage devices, including those for grid power.
(xiv) Any other identified area

6.0 Activities

6.1 RD&D activities in new and renewable energy sector shall include:

(i) Development of technology, processes, components, sub-systems and systems listed in paragraph 5.0 above.
(ii) Technology demonstration of systems/ devices listed in paragraph 5.0 above.
(iii) Prototype development of systems/ devices listed in paragraph 5.0 above.
(iv) Facilitate manufacture of systems/ devices listed in paragraph 5.0 above.
(v) Raising capacity utilization factor of grid-interactive and distributed power generation systems.
(vi) Lowering cost of new and renewable energy systems/ devices.

7.0 Deployment Aims

7.1 RD&D activities shall be oriented towards meeting system/ equipment requirement for the following deployment aims:

(i) **Grid interactive renewable power:**
Around 10% grid power installed capacity through renewable power by 2012 and around 15% by 2032.

(ii) **Alternate Fuels – bio-fuels, synthetic fuels and hydrogen:**
Substitution of upto 10% oil by bio-fuels, synthetic fuels and hydrogen in transport, portable and stationary applications by 2032.

(iii) Non-conventional energy in urban areas:
(a) Energy recovery from municipal waste - in 423 class-I cities including 107 municipal corporations where suitable waste is available – by 2032.
(b) Solar Water heating systems -100% coverage of all prospective users like hotels, hospitals etc. by 2032.
(c) 100% coverage of street lighting control systems by solar sensors in all cities - by 2012.

(iv) Non-conventional energy in industry:

(a) Energy recovery from industrial wastes where suitable waste is available across the country – by 2032.
(b) Solar Water heating systems - 100% coverage of potential industries - by 2032.
(c) Cogeneration - 100% coverage of potential sugar and other biomass based industry - by 2032.

(v) Non-conventional energy in rural areas:

(a) Provision of lighting/ electricity in around 10,000 remote un-electrified census villages apart from remote hamlets of electrified census villages – by 2012.

(b) Augmentation of cooking, lighting and motive power through renewable energy means in electrified villages – by 2032.

8.0 Partners

8.1 RD&D shall be taken up through the following Partners:

(i) Research and Development Institutions; Academic Institutions
(ii) Developers and Manufacturers of new and renewable energy technologies, processes, materials, components, sub-systems, products and services; in public and private sector; and
(iii) Union Ministries/ Departments/ Agencies/ PSUs; States/ UTs government departments/ agencies; local bodies; panchayats; community based and non-governmental organizations; and citizens and institutions funded by Union/ State/ UT Governments.

9.0 Monitoring

9.1 The RD&D effort should lead to the following:

9. 1.1 Macro Indicators

Share of:
(i) Alternate fuels in liquid fuel-mix;
(ii) Renewable energy in energy-mix; and
(iii) Renewable electricity in electricity-mix.
(iv) Distributed generation systems using renewable sources.

9.1.2 Micro Indicators

Share of indigenously designed, developed and manufactured:
(i) Vehicles using alternate fuels;
(ii) Pump-sets using alternate fuels;
(iii) Captive generation systems using alternate fuels;
(iv) Wind Turbine Electric Generators;
(v) Solar Photovoltaic systems;
(vi) Solar Thermal high temperature systems;
(vii) High pressure gasification systems coupled with high efficiency turbines;
(viii) High efficiency micro turbines;
(ix) Hybrid Systems;
(x) Any other included indicator.

10. Committee Composition

10.1 For the purpose of appraising and recommending projects for approval of the competent authority an **RD&D Project Appraisal Committee (RDPAC)** to focus attention on areas and activities listed in paragraphs 5.0 and 6.0 above and to work towards aims and purposes stated in paragraph 2.0 above is being set up with the following composition:

Sl. No.	Name/ Designation	Status
1.	Secretary, MNRE	Chairman#
2.	Principal Adviser & Special Secretary, MNRE	Vice-Chairman*
3.	AS&FA, MNRE	Member
4.	Group Head (R&D), MNRE	Member
5.	Representative of DST: Dr. V. Rao Aiyagari, Adviser, DST, New Delhi	Member
6.	Representative of CSIR: Dr. A.K. Shukla, Director, CECRI, Karaikuri	Member
7.	Dr. Vikram Kumar, Director, NPL, New Delhi	Member
8.	Dr. P. Ghosh, Director, CSMCRI, Bhavnagar	Member
9.	Dr. A. R. Upadhya, Director, NAL, Bangalore	Member
10.	Dr. R. Natarajan, Former Chairman AICTE, Bangalore	Member
11.	Dr. R. K. Khandal, Director, Shriram Institute for Industrial Research, Delhi	Member
12.	Divisional Head (R&D), MNRE	Member-Secretary

#Chairman may invite industry representatives as special invitees depending on the nature of the project.

*In the absence of Secretary, MNRE, the Committee would be chaired by the Vice-Chairman.

11. Procedure and Guidelines

11.1 Members cannot nominate others to take their place on the RD&D Project Appraisal Committee. However, AS&FA, MNRE may depute Director (IFD), MNRE as his representative, in case he is otherwise pre-occupied. Group Heads, MNRE shall be permanent invitees.

11.2 The RD&D Appraisal Committee shall draw up a list of sector specialists/ referees, who have no conflict of interest either directly or indirectly with the project proposal that is to be referred to them.

11.3 Group Heads will develop RD&D projects in consultation with the concerned industry/ institution and solicit proposals through advertisements placed in newspapers and on the MNRE website.

11.4 R&D projects may be taken up by Universities, research institutions, R&D laboratories and industry, individually or as a consortium. As far as possible, R&D projects should be taken with industry as end-users to ensure that they are involved right from the conception stage of the project. Such projects should clearly quantify outputs, that should be challenging and bench-marked to pre-identified aims.

11.5 As and when R&D proposals are received the respective Group Head shall refer the proposal to at least three referees for projects up to Rs. 5 crore and five referees for proposals exceeding Rs.5 crore. In each case at least 2 or 3 referees should support the project.

11.6 Group Heads shall forward RD&D project proposals to the Member-Secretary in prescribed formats (available on the website of the Ministry) for inclusion in the Agenda.

11.7 The Member-Secretary shall place only those RD&D project proposals received from Group Heads which are in the prescribed format before the RD&D Project Appraisal Committee for consideration.

11.8 The Committee would consider RD&D proposals, irrespective of financial outlay, but would recommend to the competent authority only those projects whose estimated cost is up to and inclusive of Rs.5 crore. Projects whose outlay exceeds Rs.5 crore would need to be placed before PIB/ EFC/ CASE for consideration.

11.9 Financial assistance for RD&D projects that involve partnership with industry should normally be restricted to 50% of the project cost. However, any proposal from Universities, Government research institutions etc. Ministry may provide upto100% funding, depending on project priority.

11.10 In case there is a request from industry for financial support in excess of the percentage indicated in para 11.9 above, the same will have to be justified on the ground that the time-horizon for technological maturity and for developing long-term competitiveness at large.

11.11 30% of the total assistance minus institutional charges/ overheads would be released initially along with the sanction. Similar amounts would be sanctioned based on achievement of aims and progress of implementation of the project. The final 10% along with institutional charges/ overheads would be released only after successful completion of the project and on receipt of project completion report and evaluation thereon by the Committee.

11.12 For all projects that are approved by the Ministry, the concerned Group/ Division shall issue the sanction and make all releases of financial assistance on achievement of milestones from a common budget head. Copies of all such sanctions would be sent to all the Group Heads, the Member-Secretary and IF Division.

11.13 Completed project reports along with an evaluation note of the Committee shall be placed in the Library after certification by the Member-Secretary.

12. IPR and Technology Transfer Issues

12.1 The grantee organization(s)/ Inventor(s) are required to seek protection of Intellectual Property Rights for the results/ output of the sanctioned RD&D projects and shall share royalty/ proceeds of sale of IPR in accordance with the guidelines given below: -

i) The Government shall have a royalty-free license/ marching right for the use of the Intellectual Property for the purposes of the Government of India and this Ministry reserves the right to require the institution and the industry to license others and that anyone exclusively licensed to market the innovation in India, must manufacture the product in India.

ii) In case MNES files patents (when grantee organization is unable to file a patent) any earnings accruing from transfer and commercialization shall be shared equally by this Ministry with the Institution and the generator of the Intellectual Property. However, wherever the expected earnings are above Rs 10 lakh, the proportion of sharing can be 40% for the institution, 40% for this Ministry and 20% to the generator of Intellectual Property.

iii) The grantee organization(s) is permitted to retain the benefits arising out of the IPR provided 1/3rd of the actual earnings is paid to the inventor(s)/ generator(s) of Intellectual Property and not less than 25% of such earnings is credited into a fund called 'Patent Fund'. The 'Patent Fund' should be utilized by the institution for renewal of the patent, protection of rights against infringements, for creating awareness and building competency on IPR and related issues and filing of new patents.

iv) If the patent is taken jointly by the institution, MNES and industry and if the industry has contributed at least one-third of the project cost, the industry (and its associate) shall have the first right to commercialize the innovation, without paying any royalty, within one year of the completion of the project. The industry shall have exclusive right to commercialize for another two years after paying royalty. Subsequently, the technology can be transferred to any other industry for commercialization.

v) The institution and industry may transfer the technology to another industry for commercialization, on terms and conditions as may be mutually agreed upon, on non-exclusive basis under intimation to MNES. Any earnings accruing from such a transfer and commercialization shall be shared between the institution and the industry as may be mutually agreed to. The details of the agreement, amounts-received, annual sales turnover of the product shall be intimated periodically to this Ministry.

This issues with the approval of the Minister of New and Renewable Energy.

(Dr. A. R. Shukla)
Director (R&D)

All Officers at MNRE Hqrs. and its Regional Offices

Copy to:

1. The Secretary, Department of Science & Technology, Technology Bhavan, New Mehrauli Road, New Delhi.
2. The Secretary, DSIR and Director General, Council of Scientific and Industrial Research, Rafi Marg, New Delhi.
3. The Secretary, Department of Bio-technology, Block 2, CGO Complex, New Delhi.
4. The Secretary, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
5. The Secretary, Department of Ocean Development, New Delhi.
6. The Secretary, Department of Atomic Energy, 145-A, South Block, New Delhi.
7. The Secretary, Department of Space, 3rd floor, Lok Nayak Bhawan, New Delhi.
8. The Secretary, Department of Information Technology, Electronics Niketan, New Delhi.
9. The Secretary, Department of Agriculture Research, New Delhi.
10. Principal Adviser & Special Secretary, MNRE, New Delhi.
11. AS&FA, MNRE, New Delhi.
12. All Group Heads, MNRE, New Delhi.
13. Sr. PPS to Secretary, MNRE, New Delhi.
14. PS to MOS (I.C.), NRE, New Delhi.
15. Master File, R&D Division, MNRE, New Delhi.

(Dr. A. R. Shukla)
Director (R&D)