IEA/IAH Annex II

Small Scale Hydro Resources and Technologies

Proposal of New Subtasks from New Energy Foundation(NEF), Japan

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Status of Hydropower in Japan

- Annual Power Production in 2004
  - Total 1094 TWh and Hydro 104 TWh(10%) including P/S*
- Planned Capacity to be Developed by Utility Companies during 2005-2014
  - Total 263 GW and Hydro 21 GW(8%) except P/S*
  - Most of New Hydro Projects < 10 MW except P/S*
- Main Causes for the Stagnation of Development
  - Reduction of Feasible Site, Uncompetitive Construction Cost and Environmental Issues

* P/S=Pumped Storage

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Government Policies in Japan

- Role and Value of Hydro
  - Domestic, Renewable and Almost Zero GHG Emission
- Facilitation of Hydro Development
  - F/S, Various Subsidies, Education & Training
- R&D Programme
  - Reduction of Cost, Enlargement of Applicability, Improvement of Efficiency
- Renewable Portfolio Standard System
  - Solar, Wind, Biomass, Geothermal and Small Hydro (<1MW)

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Recent R&D Programmes in Japan

- Turbine and Generator
  - Ultra Low Head Generator, Variable Speed Generator, Distributed Small Hydro System
- Dam and Channel
  - Alternate Material for Penstock, Dam Foundation Treatment Method, Improvement of TBM, Rubber Dam Operation
- Maintenance and Management
  - Diagnostic System for Dam Gates and Penstocks
- Environment
  - Recovery of River Ecosystem in Reduced Flow Stream

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Objective of Participation in the Annex 2

- To learn about experiences on national policies and social backgrounds promoting small hydro development in various countries.
- To find innovative technologies enlarging applicability of small hydro and improving efficiency under various site conditions.
- To investigate advanced methods for maintenance and management of existing plants.

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Previous Outputs of the Annex-2 Concerned

- Assessment of Future Opportunities for R&D (2000)
  - Future Challenges on Overall Design, Turbines, Electrical and Civil Engineering
- Small Hydro- Mechanical Equipment (2000)
  - Classification, Characteristics and Design of Various Turbines
- Objectives for Small Hydro Technologies (2000)
  - Future Challenges on Environmental Conservation, Integrated Design and Low Head Turbines
- Fish Passage at Small Hydro Sites (2000)
  - Downstream and Upstream Migration System

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Subtask 1 Public System and Experiences

Objective:

To promote small hydro development by analyzing and assessing the effect of policies, regulations and standards worldwide from the viewpoint of public system and social backgrounds.

Contents:

1) Survey on Social Backgrounds
2) Survey on Facilitation Measures
3) Survey on Regulations and Standards
4) Case Studies

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Subtask 2 Innovative Technologies

Objective:

To provide useful information for the development of new hydro plants and updating of existing facilities by surveying recent innovative technologies to enlarge applicability of small hydro, to improve efficiency and to conserve environment, including their operations and specific applications.

Contents:

1) Survey on Innovative Technologies
2) Case Studies

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Subtask 3 Rehabilitation/Upgrading/Modernizing of Existing Small Hydro Plants

Objective:

To collect information on advanced methods and their specific applications for the maintenance and management of existing small hydro plants increasing asset efficiency as well as preserving the soundness of old facilities and equipment.

Contents:

1) Survey on Advanced Maintenance and Management Methods
2) Case Studies

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Organization of the Proposed Subtasks

No.	Classifi-cation*	Subtask	Subtask Leader	Partici-pants
1	A-3	Public System and Experiences		Japan
2	B-2	Innovative Technologies	Japan	
3	B-4	Rehabilitation/upgrading/modernizing of existing small hydro plants		Japan

* Classification of Annex-2 Phase 3 Tasks

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