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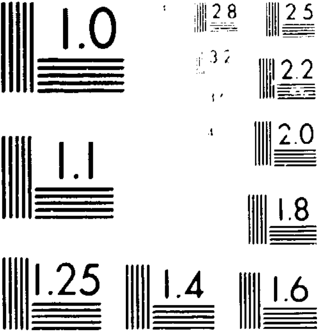

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Second Seminar-Workshop/Study Tour in the
Development and Application of Technology for
Mini-Hydro Power Generation (MHG)

Hangzhou, China, 17 October - 2 November 1980

Manila, Philippines, 3 - 8 November 1980

SUMMARY MINI-HYDRO PROJECT
THAILAND*

by

Office of Rural Electrification
Provincial Electricity Authority**

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** Ministry of Interior, UNIDO-PRC, 18 October - 2 November 1980.

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SUMMARY MINIHYDRO PROJECT

1. RESPONSIBLE ORGANIZATION: Office of Rural Electrification, Provincial Electricity Authority (PEA), Ministry of interior, as authorized by the Cabinet resolution dated 30 October 1979.

2. COOPERATING AGENCIES: National Energy Administration (NEA), Electric Generating Authority of Thailand(EGAT), Royal Irrigation Department(RID), Department of Forestry (DOF) and National Economic & Social Development Board (NESDB), etc.

3. PROPOSED STUDY: Pre-Feasibility Study (Master Plan) for a package long-range program for overall minihydro schemes in Thailand. This is one of the 3 renewable energy, together with wind and solar systems, in PEA's future plan.

4. GENERAL BACKGROUND: Thailand has high hydro potentials for electric power production. Most of the big hydro schemes in the country have been developed or in the stage of developing by EGAT (presently there are about 7 in operation and 4 under construction). Not many big hydro schemes are left to be developed including the 3 international schemes (Mae Khong, Salawin, Sungai Kolok Rivers). On the other hand, only a few of the small hydro schemes — mostly in the North Thailand — have been developed or are under developing by NEA, EGAT, RID, DOF.

   At present, there are 3 minihydro systems in operation, both in the North:
   - Mae Hongson System (0.8 MW) operated by NEA and sell power to PEA to supply 2 districts of Mae Hongson Province, i.e., the Provincial Center and Khun Yuam District.
   - Ban Yang System (0.1 MW) operated by EGAT and sell power to PEA to supply 4 villages nearby during the off-peak hours, but during the peak hours PEA has to supplement the supply from the diesel-generating plant in Fang District of Chiang Mai Province.
   - Doi Ang Kang (0.02 MW) operated by RID and serve the Winter-Crops Experiment Station. Also another 3 minihydro systems are under construction,

   Also another 3 minihydro systems are under construction, all in the North:
   - Mae Kum Luang (3.0 MW) in Fang District of Chiang Mai Province, by NEA.
   - Huay Mae Pong (0.9 MW) in Dok Kamtai District of Phayao Province, by NEA.
   - Huay Nam Dang (0.2 MW) in Mae Tang District of Chiang Mai Province,by DOF.

The pace of minihydro development has been slow in the past while there are so many untapped potential schemes left to be developed in the future. PEA has conducted a preliminary study and found out that there are at least

500 potential minihydro schemes (of 1.0 MW and below) which can be developed. With the oil crisis at present and expected to continue in the future, the minihydro schemes are proved to be more and more attractive and feasible. Also in term of making the country less dependent on oil for electric energy production by using its own natural resources, the Government is in full support for the project. This project has also been under the personal interest of His Majesty the King, who suggested PEA to play a major role the field of minihydro. PEA as operating agency is capable for the future operation of the large-scale minihydro schemes which are mostly isolated system – rarely to be connected to the National Grid System of EGAT. EGAT as the generating agency has expressed their interest only on the medium and big hydro schemes. NEA as the main supervising and regulating body is assigned to the initiating function on survey, plans and studies for overall minihydro schemes, with assistance from PEA, EGAT, RID etc.

5. PEA INVOLVEMENT: With the recommendation of His Majesty the King, PEA is beginning with first 5 pilot projects of about 500 kW each in the Chiang Mai, Chiangrai, Mae Hongson, Suratthani, and Yala Provinces. These schemes shall be assisted by the Governments of Finland, Norway, Switzerland, China and United Kingdom as package assistances on the grant basis.

   The G-to-G Agreements shall be completed soon sometime by end-1980 to early-1981 while the feasibility studies shall also be simultaneously conducted and subsequent constructions shall be taken place in mid-1981. With the 5 donor countries participating initially, PEA shall have sufficient experiences in the concept, design, operation and maintenance of the small-scale hydro systems for future implementation of the long-range program.

6. PROJECT DESCRIPTION: Before going into the large-scale minihydro program, it is necessary for PEA to have a definite guidelines for future implementation. Therefore, the overall study at the level of socalled "Pre-Feasibility Study" is proposed to be conducted with the assistance of experienced foreign advisers. The preliminary scope of work for the Pre-Feasibility Study or Master Plan shall be as follows:

   - Identify the project as a long-range and complete package program.
   - Set up the most probable time-frame of the project to the optimum benefits of the nation.
   - Make preliminary investigation of all potential sites for micro minihydro schemes (1.0 MW and below)

- Make preliminary pre-feasibility study for individual and overall project costs, benefit-to-cost ratios, financial and economic rates of return, etc.
- Make preliminary least-cost calculation for individual and overall schemes comparing with the other 2 alternatives of diesel-generation system and connection to the grid system (using natural gas as the base fuel).
- Set up the priority list of all potential schemes for subsequent Feasibility Studies and scheme implementations.
- Recommending the phased programs for annual and periodical (5-year range coinciding with the National Social and Economic Development Plans — 4th, 5th, 6th, etc.) implementations.