IEA Hydropower Implementing Agreement

Overview of the Hydropower Implementing Agreement

NEET Workshop

Brasilia, November 2007

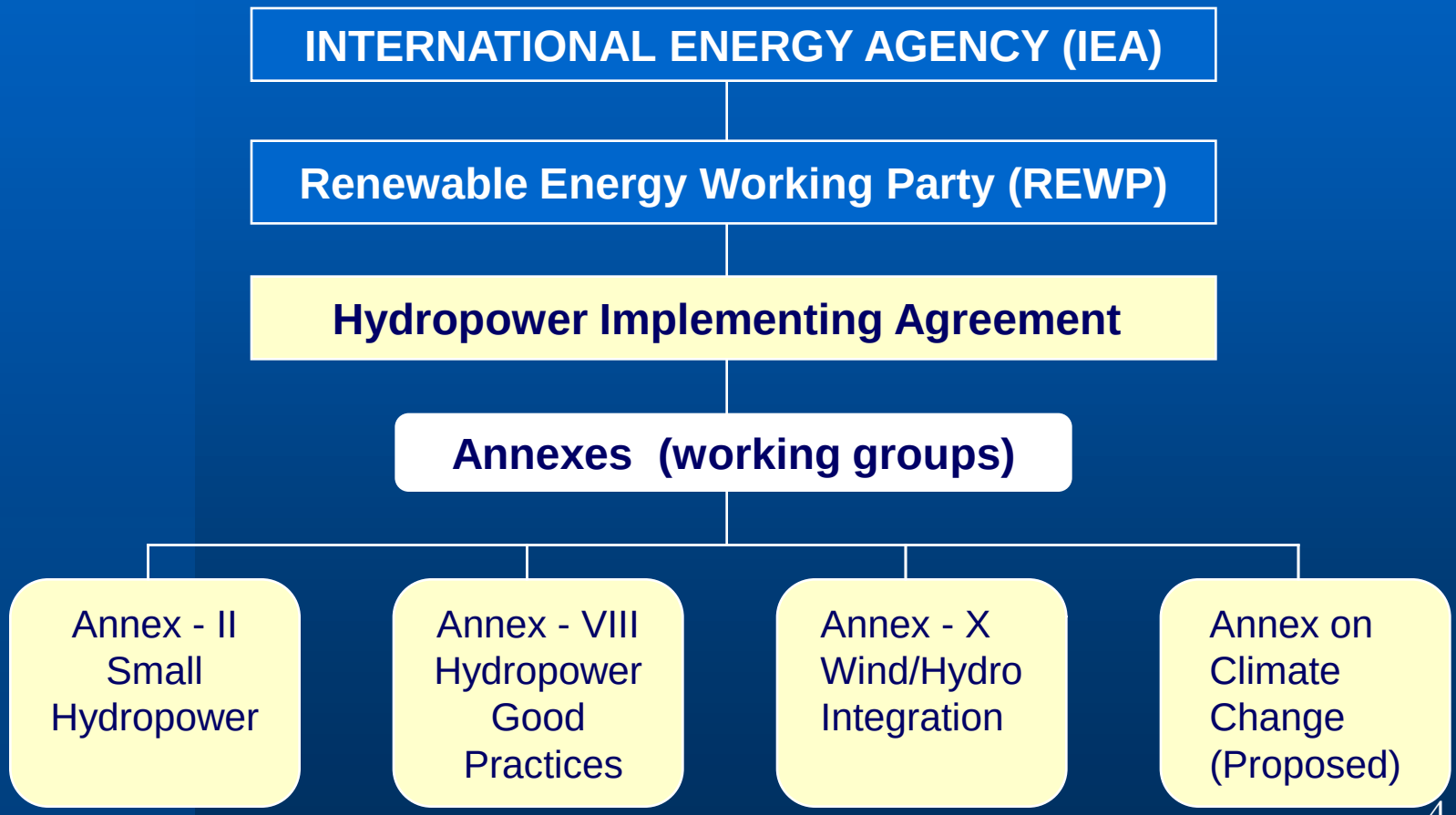
Contents

- IEA & the Hydropower Implementing Agreement
  - Structure
  - Membership & Participating Countries
  - Vision & Mission
- Achievements & Activities
  - Completed Annexes
  - Ongoing Annexes
  - Proposed New Annex on Climate Change

IEA & the Hydropower Implementing Agreement

- The International Energy Agency (IEA) provides a **structure for international co-operation** in energy technology R&D
- The Implementing Agreements (IA) of the IEA are the **vehicles of co-operation** between countries and organisations focusing on particular energy sources
- Research projects are conducted by working groups of the Implementing Agreements called **Annexes**

Organisational Structure



Membership

Who can join?

- all OECD & non-OECD countries
- Agencies
- International Organizations
- Companies

※All Participants must join at least one Annex

Participating Countries

Brazil : Ministry of Mines and Energy

Canada : NRCan & Hydro Quebec

China : International Centre on Small Hydropower (IN-SHP)

Finland : Finnish Funding Agency for Technology & Innovation (TEKES) & Kemijoki Oy

Japan : New Energy Foundation (NEF), Agency for Natural Resources & Energy (MITI)

Norway : E-CO Vannkraft

Sweden : Elforsk AB, the Swedish National Energy Administration

Vision & Mission

Vision

- Through the facilitation of worldwide recognition of hydropower as a well-established and socially desirable energy technology, **advance the development** of new hydropower and the **modernisation** of existing hydropower

Mission

- To encourage through awareness, knowledge, and support **the sustainable use of water resources** for the development and management of hydropower

IEA Hydropower Implementing Agreement

Overview of the Hydropower IA Annexes

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Completed Annexes : Phase 1 (1995 – 2000)

Annex-I : Upgrading of Hydropower Installations

- Outcomes : 3 Volume Set of Guidelines
  - Guidelines on Methodology for Hydroelectric Francis Turbine Upgrading by Runner Replacement
  - Guidelines for Hydroelectric Generator Upgrading
  - Guidelines on Methodology for Control Systems Rehabilitation

Completed Annexes : Phase 1 contd.

Annex-III : Environmental & Social Impacts of Hydropower

- Outcome : 4 Major Reports
  - Survey on Positive and Negative Environmental and Social Impacts and Effects of Mitigation Measures on Hydropower Development
  - A Comparison of the Environmental Impacts of Hydropower with those of Other Generation Technologies
  - Survey of existing guidelines, legislative framework and standard procedures for EIA of hydropower projects
  - Hydropower and the Environment: Present Context and Guidelines for Future Action (3 Volumes)

Completed Annexes : Phase 1 contd.

Annex-V : Education and Training in Hydropower O&M

- Outcomes : 5 reports
  - Survey of Current Education and Training Practices in Hydropower Operation and Maintenance
  - Structure of Operations and Maintenance Training Programmes
  - Survey of Current Education and Training Practices in Hydropower Planning
  - Structuring of Education and Training Programmes in Hydropower Planning, and Recommendations on Teaching Material and Reference Literature
  - Implementation of Information Technology and a Computer Network System for Distance Learning in Hydropower E&T

Completed Annexes : Phase 2 (2000 - 2005)

Annex-VI : Public Awareness

- Outcomes: Website & Publications
  - www.ieahydro.org website content
    - balanced, objective information about a range of hydropower subjects for both professionals and non-professionals
    - technical reports
    - IEA Hydropower reports
  - Position paper & brochure
    - Hydropower and the World's Energy Future
    - Hydropower : A Key to Prosperity in the Growing World

Completed Annexes : Phase 2 contd.

Annex-VII : Education & Training : Hydropower Competence Network

- Outcomes :

  Model for an Internet-based international network for training of personnel in the hydropower industry

  - For more information see links on www.ieahydro.org to the International Centre for Hydropower, Trondheim, Norway

New & Ongoing Annexes : Phase 3 (2005-2010)

New

- Annex X: Wind/Hydro Integration

Ongoing

- Annex II: Small Hydropower
- Annex VIII: Hydropower Good Practices (Distribution Phase)

Proposed

- New Annex on Climate Change

New Annex : Phase 3

Annex- X : Wind/Hydro Integration

The Hydropower IA Annex X works jointly with the Wind IA to :

- undertake cooperative research and studies on:
  - grid integration, transmission issues, hydrological impacts, market and economic issues & simplified modelling of wind-hydro integration potential
- identify technically and economically feasible system configurations for integrating wind and hydropower
- provide a forum for information exchange
- document case studies for a future on-line library
- Major report to be published mid-2008

Ongoing Annexes : Phase 3

Annex-II : Small Hydro

- Participants:
  - Members : Canada, Finland, France, Japan, Norway
  - Associate Members : Brazil, China, ESHA, India
  - Operating Agent/Secretary : Kearon Bennett, Canada
- Tasks (General):
  - Web site (http://www.small-hydro.com) : led by Canada
  - Lessons/ Promotion/ Barriers : led by ESHA
  - Government Policies and Experience : led by Secretary
  - Small Hydro Workshops : led by Canada

Ongoing Annexes : Phase 3

Annex-II : Small Hydro (contd.)

- Tasks (Technical):
  - Small-hydro Environmental Policies and successful mitigation measures : led by ESHA
  - Innovative Technologies and applications for small, mini and micro hydro : led by Japan
  - Energy storage (hydrogen) : led by ESHA
  - Computerised tools for preliminary design, assessment and equipment selection : led by Canada
  - Successful rehabilitation / upgrading / modernising of existing small hydro plants

Ongoing : Phase 3

Annex-VIII : Hydropower Good Practices Environmental Mitigation Measures and Benefits (Distribution Phase)

Annex-VIII

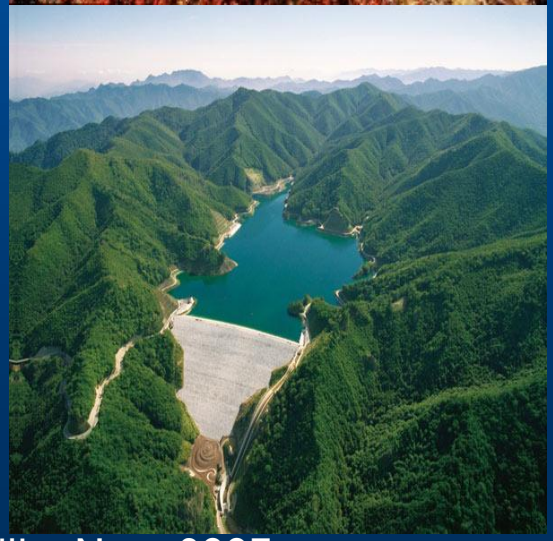
Significance of the Report

- First systematically-collected case studies
  - Unprecedented collection, compiling Good Practice in a wide variety of worldwide hydropower projects.
  - Peer reviewed through a series of workshops at international conferences
- Collecting fair & impartial information
  - Support for arguments on sustainability of hydropower through presenting objective data
- Learning from experiences worldwide
  - Lessons which can be introduced into practices at each stage of planning, operating and maintaining hydropower projects

Annex-VIII

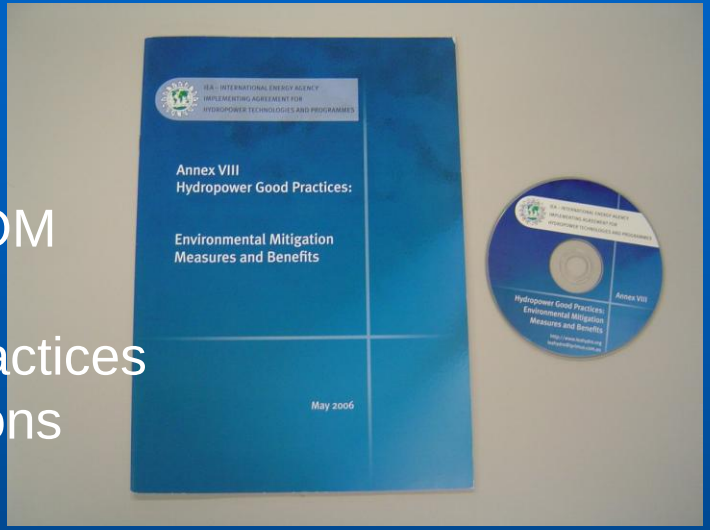
Classification of Case Studies based on 15 Key Issues

- **Biophysical Impacts**
  1. Biological Diversity
  2. Hydrological Regimes
  3. Fish Migration & River Navigation
  4. Reservoir Sedimentation
  5. Water Quality
  6. Reservoir Impoundment
- **Socio-Economic Impacts**
  7. Resettlement
  8. Minority Groups
  9. Public Health
  10. Landscape & Cultural Heritages
- **Benefits on Hydropower Development**
  11. Benefits due to Power Generation
  12. Benefit due to Dam Function
  13. Improvement of Infrastructures
  14. Development of Regional Industries
  15. Others



Annex-VIII

Final Product



- Executive Summary Report & CD-ROM
  - Methodology
  - Outlines and Trends in Good Practices
  - Conclusion and Recommendations
  - 60 Case Studies on CD-ROM
- Accessing the Report
  - Online at www.ieahydro.org
    - Executive Summary Report & 60 Case Studies in pdf
  - Hard Copy
    - Printed Report & CD-ROM
    - Small Package & Postal Charge
    - ieahydro@iprimus.com.au or through the Website

New Annex Proposed 2007

Dealing with the Effects of Climate Change on Hydropower

NEET Workshop, Brasilia, Nov. 2007

Proposed New Annex on Climate Change

- Participants

  Countries which have indicated interest in this work are:

  - Brazil Finland Japan Norway

- Objective

  The overall objective of this Annex will be:

  - To investigate the relationships between climate change and hydropower, and develop best practices for the successful operation of existing hydropower and the development of new hydropower

Proposed New Annex on Climate Change

- Task Forces

  Possible areas of focus are:
  - GHG emissions from freshwater reservoirs
  - Impacts of climate change on hydropower performance and safety
  - Water management issues: floods and droughts and their impacts
  - CDM as a tool for implementing more hydropower in developed and developing nations

- For More Information
  - Contact the Secretary via the IA website:

    www.ieahydro.org.

Conclusion

IEA Hydro has been actively involved in advancing hydropower worldwide for over 12 years.

This has been an overview, only, of the work of the Implementing Agreement

A full account of its activities and accomplishments, including all reports and publications is available at: http://www.ieahydro.org

Thank you

www.ieahydro.org