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# WWF Approach to Hydropower in the Mekong

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**Presentation to  
BDP Stakeholder Workshop  
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# Outline

- Global Energy demand and Climate Change
- The role of Hydropower, benefits and problems
- Environmental Considerations for Sustainable Hydropower Development (ECSHD)
- Dams of specific Concern
- Free Flowing Rivers





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## Humanity's growing demand for energy

In 1900 there were just over 1 billion people on the planet – by 2000 there were 6 billion with everyone using an average 4 x as much energy as their forefathers 100 years ago

From 1800-1980 humans produced a total 244 petajoules of energy; from 1980-1999 another 117 petajoules were consumed

See Weart, S.R. 2003 "The Discovery of Global Warming" Harvard Univ. Press  
And Sabine, C.L. et.al. "The Oceanic Sink for Anthropogenic CO<sub>2</sub>" Science 305 pp 367-71





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## Changing the Global Climate

Since the start of the Industrial Revolution, a Global Warming of 0.63C has occurred on our planet, caused mostly by an increase in atmospheric CO<sub>2</sub> from 3 parts per 10,000 to just under 4.

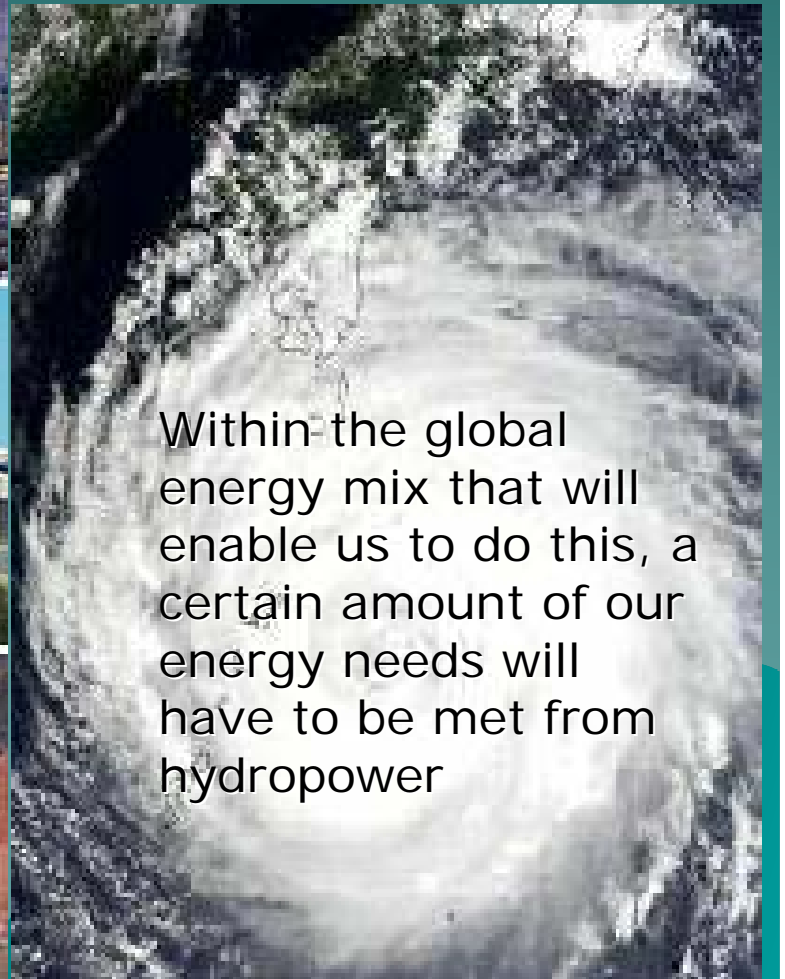
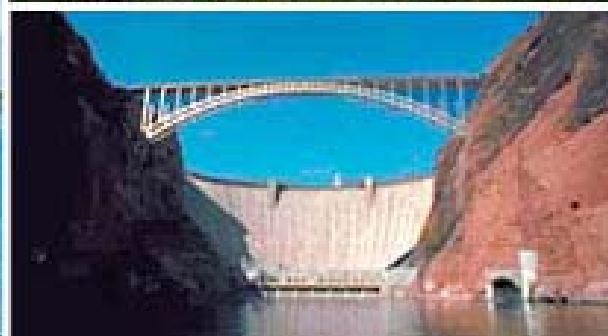
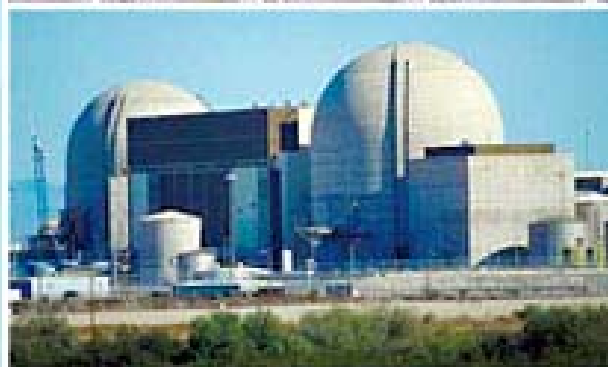
Most of the burning of fossil fuels has happened over the last few decades

Mokhov, I.I. et. al. 2002 "Estimation of Global and Regional Climate Change in the 19th and 20th Centuries" *Izvestiya Atmospheric and Oceanic Physics* 38, PP 555-68





WWF's Global Energy Vision 2050 shows it is possible to meet future energy needs while staying within two degrees warming



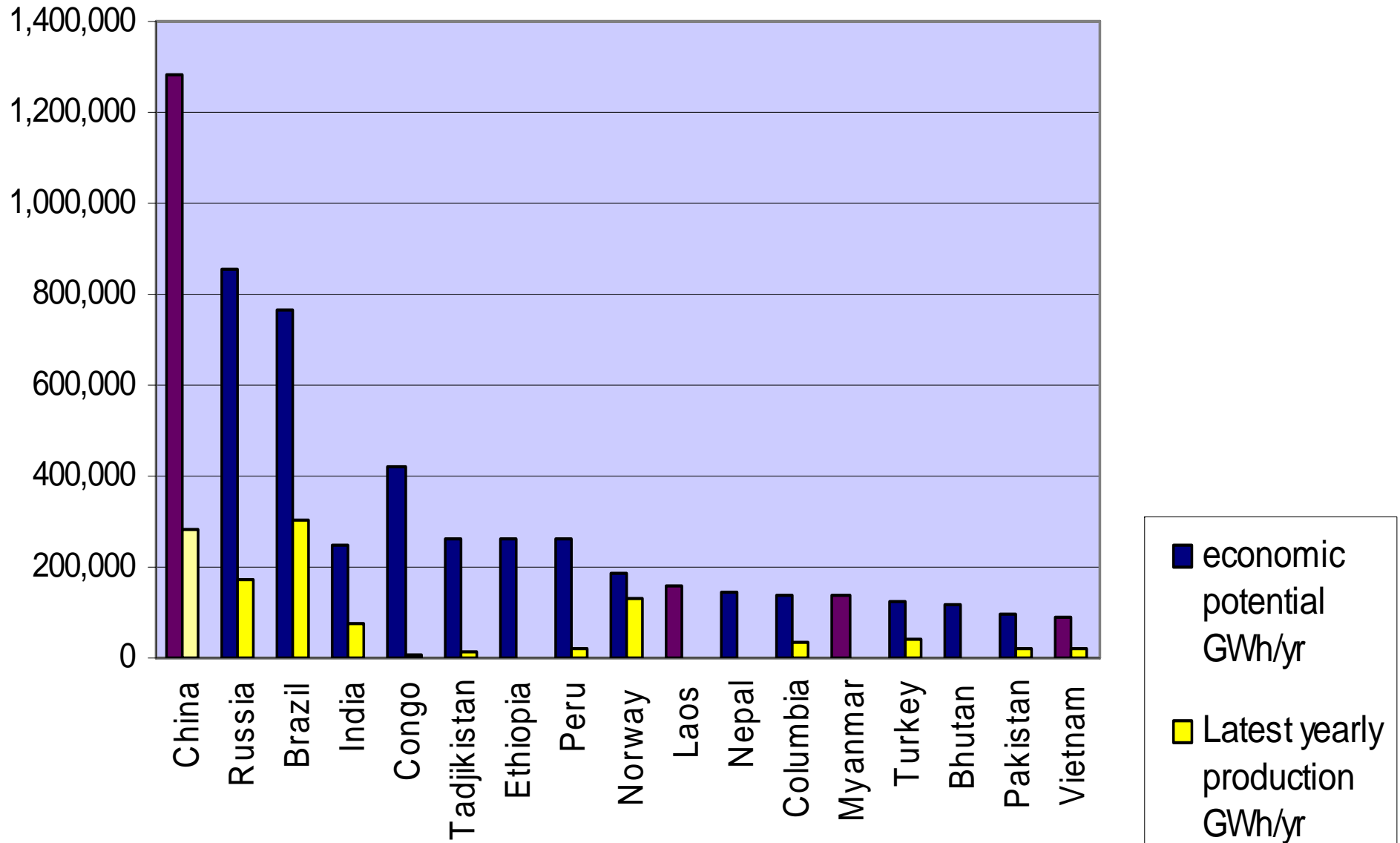
Within the global energy mix that will enable us to do this, a certain amount of our energy needs will have to be met from hydropower



Overall around 30% of remaining hydropower potential will need to be developed – much of it in developing countries



# Top 16 Hydropower potentials



ADB / MRC / WWF

Joint Initiative on  
Environmental Considerations for  
Sustainable Hydropower Development  
in the Mekong region

Contact the Secretariat through  
[marc.goichot@wwfgreatermekong.org](mailto:marc.goichot@wwfgreatermekong.org)



# Hydropower has many benefits:

- ◆ Hydropower is generally a renewable resource – basically needs rain and gravity
- ◆ Little greenhouse gas emission (in most cases)
- ◆ High reliability, responsive to rapid demand changes such as peak/offpeak transitions
- ◆ Depending on site conditions can be least cost source of energy

# But there is a downside....

Depending on the site, there could be:

- ◆ Construction impacts (dust, noise, vibration, sedimentation, water quality deterioration)
- ◆ Loss of productive land due to impoundment
- ◆ Alteration of downstream water flows
- ◆ Loss of forest cover (dam, transmission lines, facilities)
- ◆ Social and environmental impacts of construction camps
- ◆ Methane release (greenhouse gas) from impoundment
- ◆ Impact on resident and migratory fish species
- ◆ Destruction of critical freshwater and terrestrial habitats
- ◆ Loss of freshwater and terrestrial biodiversity
- ◆ Soil erosion and slope instability around reservoir margins
- ◆ Flow peaks causing downstream erosion and possible loss of life
- ◆ Impacts from associated road works and borrow pits
- ◆ Opening up access to farmers, hunters, illegal timber harvesters
- ◆ Impaired navigation, placing pressure on downstream ports
- ◆ Water-logging and impacts on groundwater
- ◆ Encroachment on archaeological and cultural sites
- ◆ Barrier to migrating fish species
- ◆ Possible increased seismic instability from large dams
- ◆ Impaired aesthetics and reduced tourism potential
- ◆ Eutrophication: algal and water weed blooms
- ◆ Release of anoxic water
- ◆ Increased habitat for water-related disease vectors
- ◆ Barrier to wildlife migratory routes and conservation corridors
- ◆ Alteration of seasonal water temperature patterns
- ◆ Disrupted flow of organic and nutrient materials downstream

# Objective of the Joint Initiative

*The ECSHD initiative aims to formulate locally appropriate environmental criteria for sound and sustainable hydropower development for the benefit of countries in the Mekong region.*

## The criteria will:

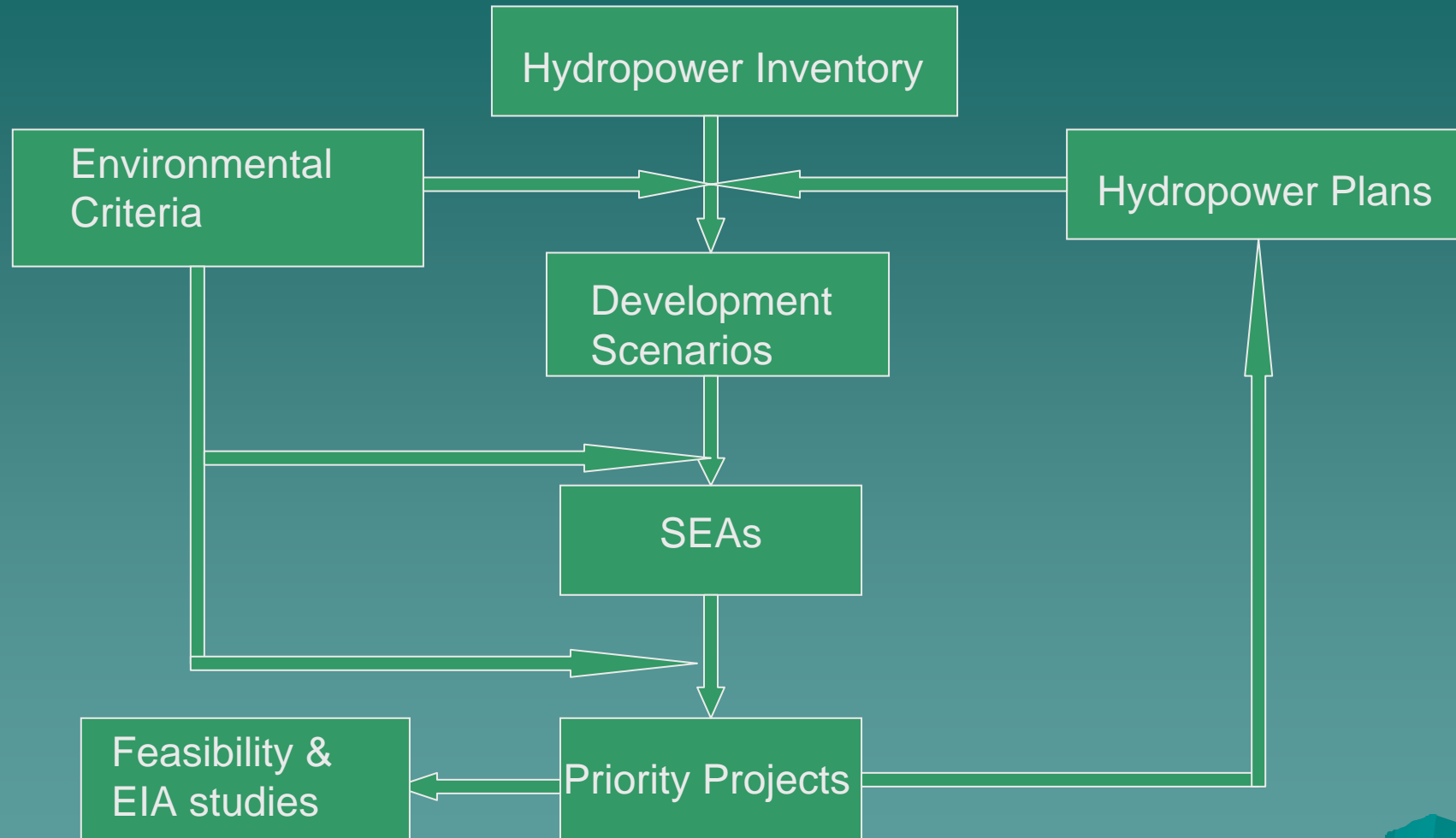
- set guiding principles by which proposed hydropower projects are assessed at early stages of sector planning
- provide a practical tool for applying IWRM and realizing complementary objectives of economic growth, poverty reduction and sustainable development
- go beyond the limitations of a conventional single sector development approach

# Why environmental criteria for hydropower?

- need to promote renewable sources of energy with minimal impacts
- current system of sector planning & project selection focuses mainly on economic and technical aspects – environment is an add on
- some projects experienced major delays and additional preparation costs together with high levels of risk and uncertainty
- can help to identify most appropriate projects and which areas are most environmentally sensitive
- can also improve operation of existing schemes

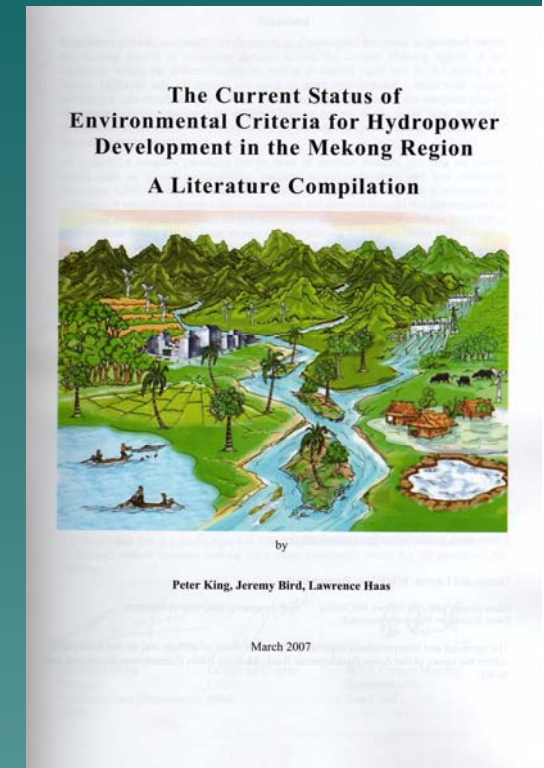


# Entry points for environmental criteria



# Key activities / outputs so far (Phase I)

- initial scoping stage completed – assessment made of current planning processes, preliminary hydropower inventory and stakeholder analysis
- consultation process with the governments of Cambodia, PRC, Lao PDR, Thailand and Viet Nam completed



# Next steps – getting involved

## Engage in the following process:

- Project formulation (first half of 2008)
- Development of ECHSD (2008-9)
- Review and internalization in national systems (2009)

## Specific activities related to the private sector:

- Establishment of a private sector focal group
- Explore linkages with ongoing processes related to IHA guidelines and other good practice

# What results can we expect?

- ◆ By 2010, it is expected that Phase II key outputs would have been identified by the GMS countries and should have been delivered.
- ◆ These could include:
  - SEAs of national hydropower plans;
  - a comprehensive hydropower inventory;
  - environmental criteria for hydropower in the Greater Mekong Sub-region;
  - results of stakeholder participation; and
  - program design for future work by the ECHD.



# Agriculture Driver Group 1 – Local/National Strategies

**Objective 1:** Securing a Legal Basis for Community Management of Forests/Wetlands

- ◆ **Lead – Marc and Nick – forests; Robert – wetlands**
- ◆ Develop legal agreements between district/commune authorities and communities for management of forests and wetlands [LA, KH, TH, VN]
- ◆ Provide technical support to governments to develop/revise national/local legislation (specifically for community management/ownership/benefit sharing and use agreements) [4 countries]
- ◆ Promote communal ownership/tenure in strategic areas, e.g. Protected Area corridors [VN, KH, LA]
- ◆ Provide capacity building and technical training for communities on how to manage resources



# Dams of Special Concern – the Lower Mekong Mainstream

- Sambor: 2,500MW
- Don Sahong: 240MW (Mega First, Malaysia)
- Xayaboury: 1,260MW Laos (Chor Kan Chang Co. Thailand)
- Pak Lay: 1,329MW Laos (China Electronics I&E, Sinohydro)





## **Sambor:**

Conduct detailed studies of economic impacts on fisheries and agriculture in the Tonle Sap and the Delta

## **Don Sahong:**

Look into feasibility of alternative design/location

## **Luang Prabang-Loei Cascade:**

Alternative options for Thai Energy needs?





## FREE FLOWING RIVERS

- Promote recognition of values of free-flowing rivers (studies and communications)
- Develop work on management of other issues in rivers likely to remain (relatively) free of hydropower
- Start with Dza Chou, Songkhram, Xe Bang Hien and Srepok



THANK YOU

