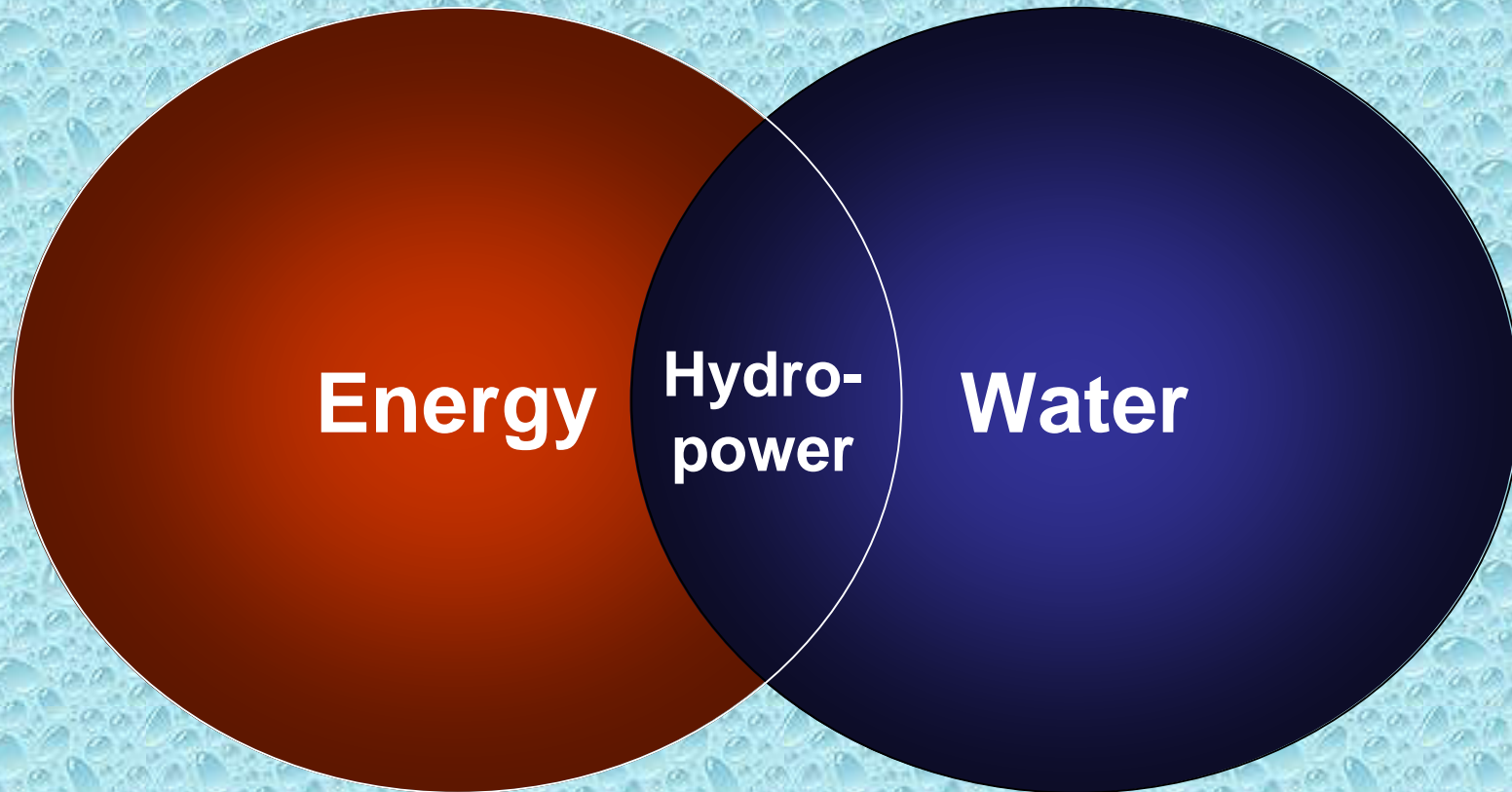


Hydropower's contribution

1. Water and energy needs
2. Hydropower's
 - Current role
 - Future potential
 - Kyoto context

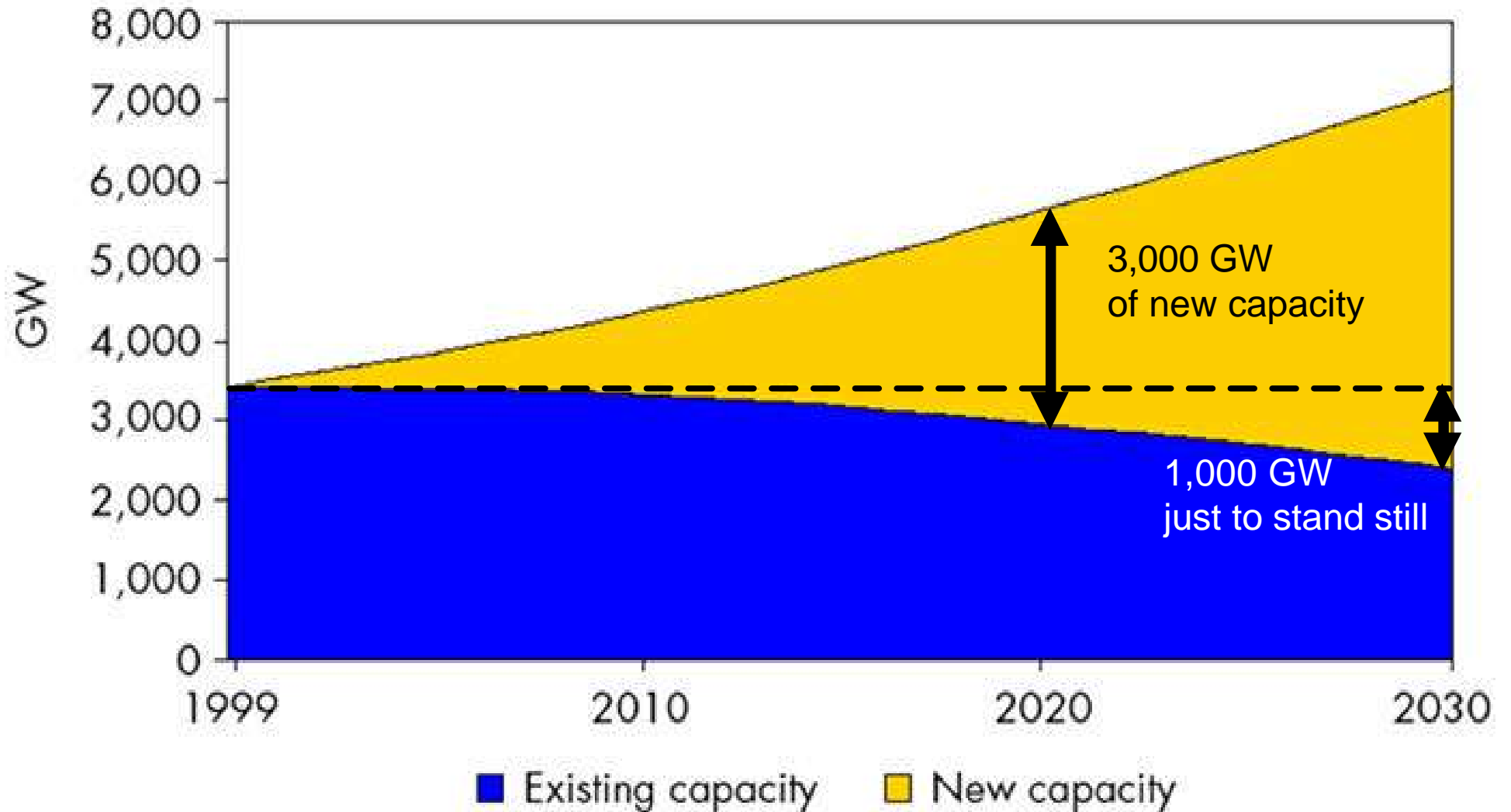


Hydropower: at the crossroads of two basic human needs



*With good planning and management,
hydropower is a catalyst for the
sustainable improvement of people's lives.*

World electricity generation capacity (IEA, WEO, 2002)





“Water, Energy, Health, Agriculture and Biodiversity (WEHAB): five key areas in which progress is possible with the resources and technologies at our disposal today.”

Kofi Annan, UN Secretary-General, World Summit on Sustainable Development, Johannesburg 2002

“We recognize the role of hydropower as one of the renewable and clean energy sources, and that its potential should be realized in an environmentally sustainable and socially equitable manner.”

Ministerial Declaration of 170 Countries, World Water Forum, Kyoto 2003

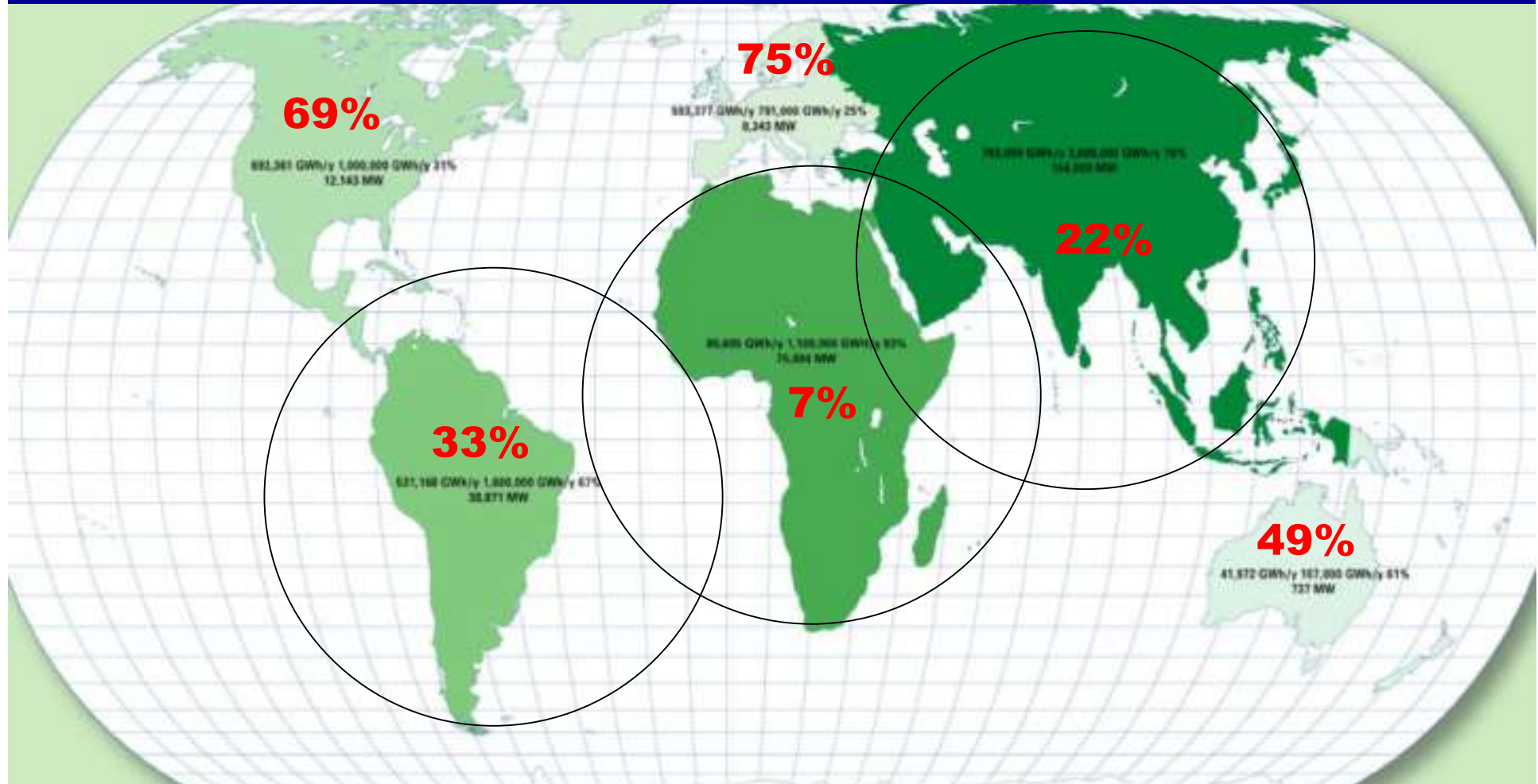


Hydropower leads the renewable electricity sector and complements the development of intermittent technologies

World's realistic potential developed: 33 %

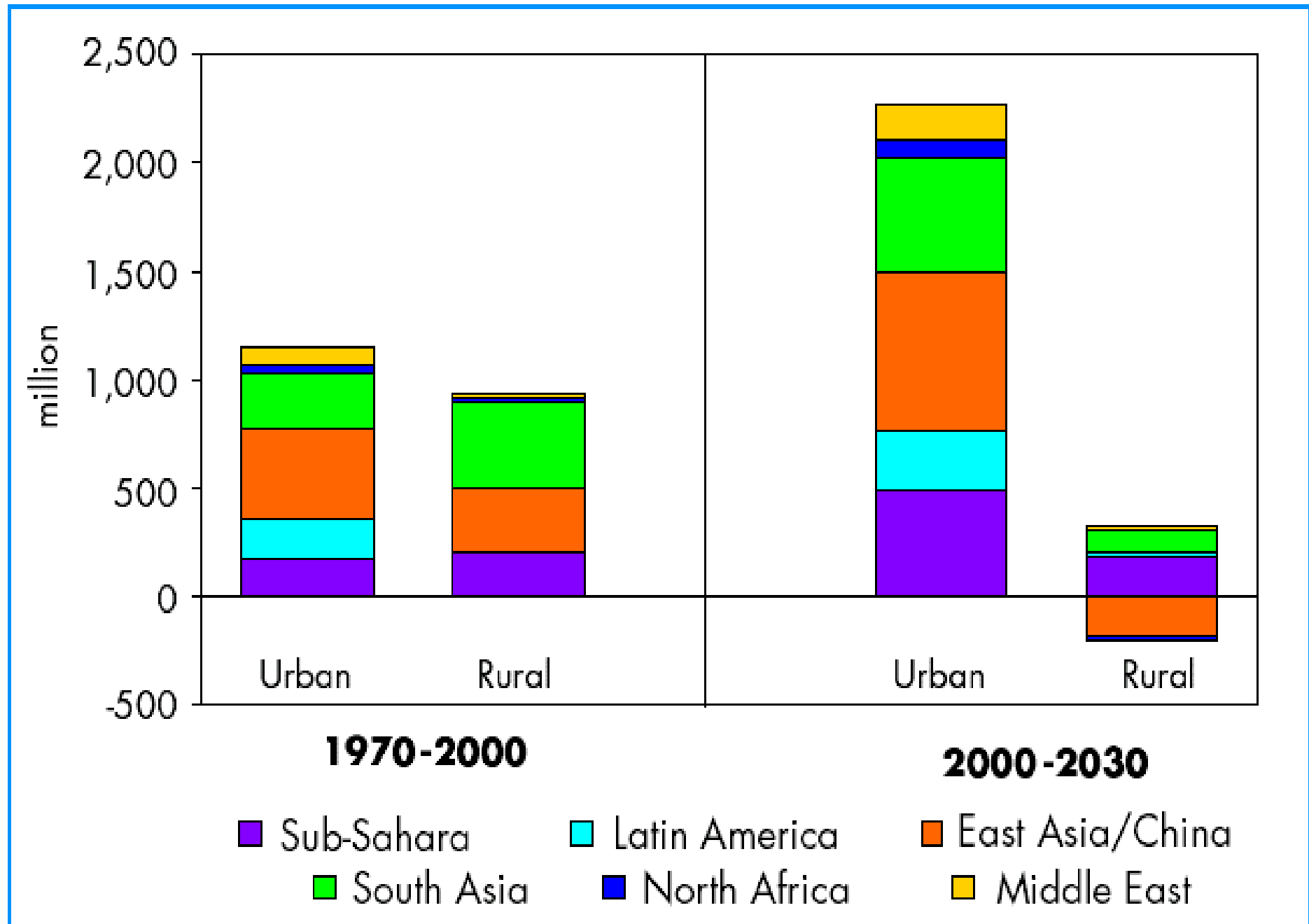
Current hydro production: 2740 TWh/y

Realistic potential production: >8000 TWh/y



**Current hydro generation: Africa = 80 Asia = 800 Australasia = 43
Europe = 570 N/C America = 700 S America = 550 (TWh/year)**

Population increase in developing countries (IEA, WEO, 2002)



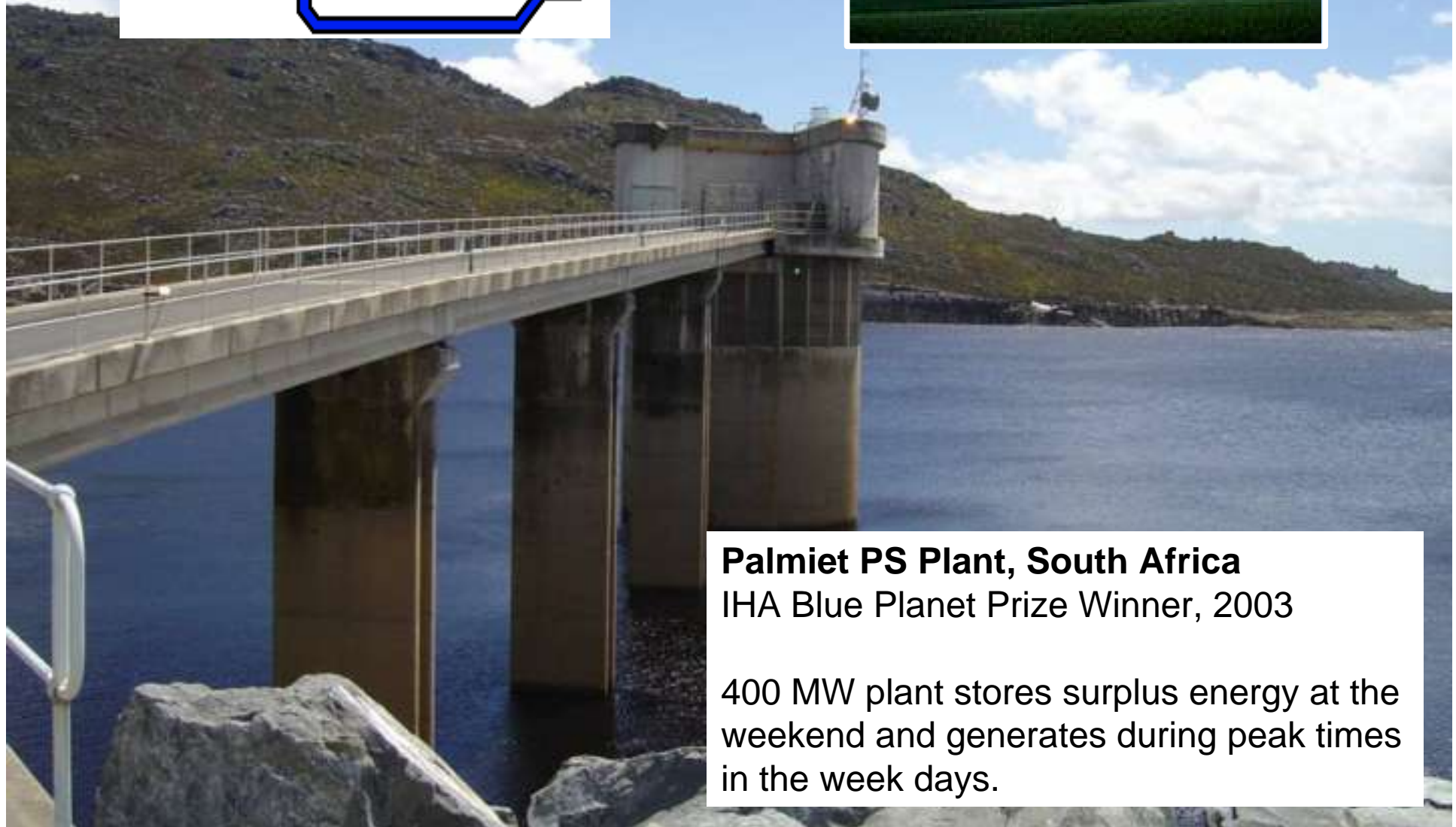
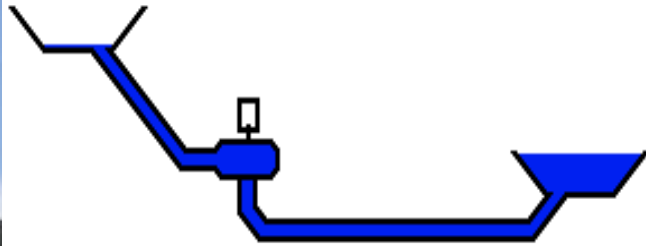
1240 MW Salto Caxias Scheme, Brazil

IHA Blue Planet Prize Winner, 2003

Community-led social redevelopment
600 families gaining new homes,
schools, clinics and employment,
in addition to clean water and power



Pumped Storage



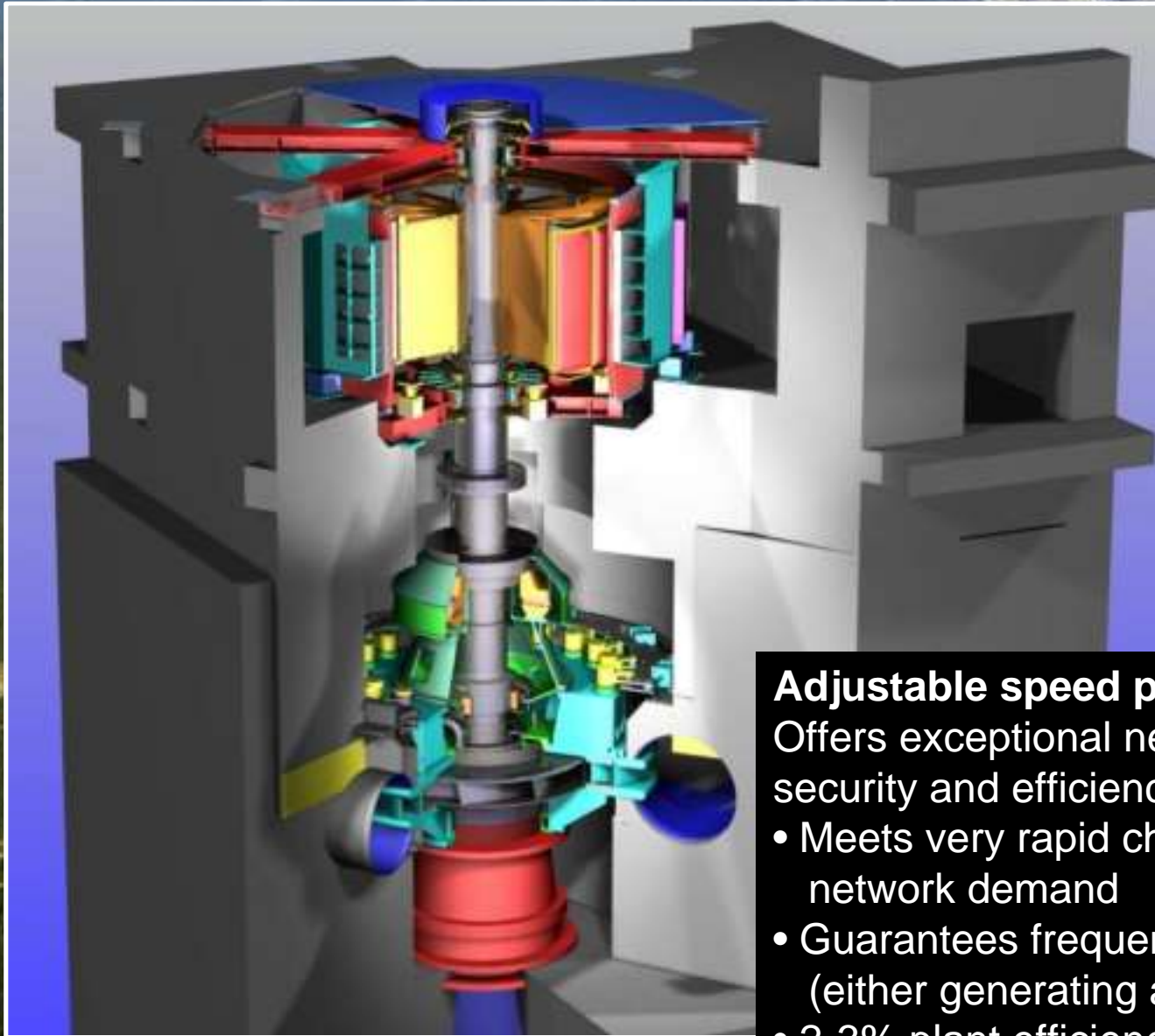
Palmiet PS Plant, South Africa

IHA Blue Planet Prize Winner, 2003

400 MW plant stores surplus energy at the weekend and generates during peak times in the week days.

1060 MW Goldisthal PS Plant, Germany

Four units, two of which utilize adjustable-speed technology



Adjustable speed pumped storage

Offers exceptional network security and efficiency:

- Meets very rapid changes in network demand
- Guarantees frequency control (either generating and pumping)
- 2-3% plant efficiency improvement

450 MW of wind power planned over the next 5 years



King River Hydro Development, Tasmania, Australia
IHA Blue Planet Prize Winner, 2001

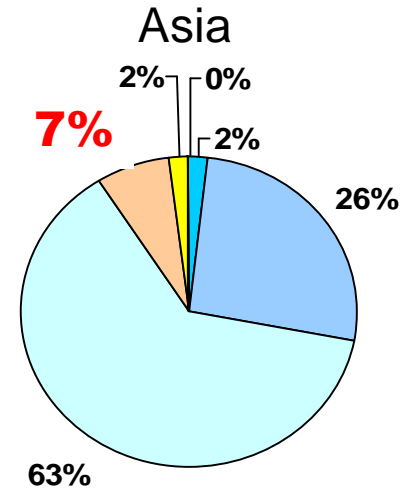
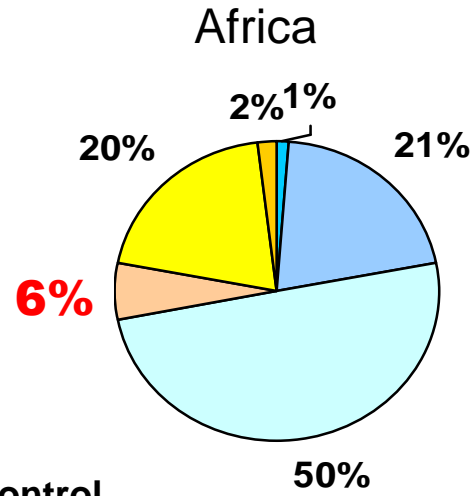
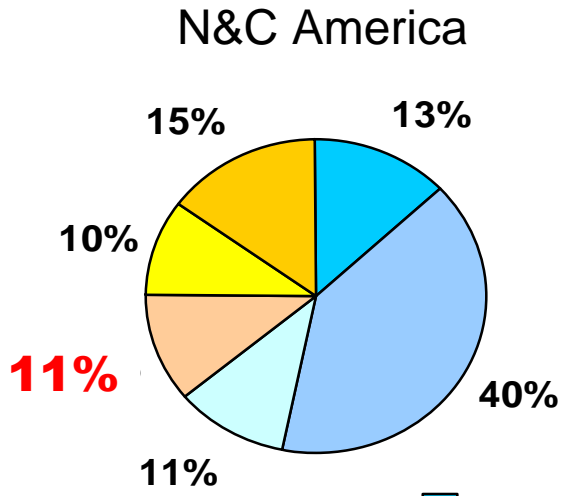
Hydro reservoirs provide the firming capability
to cover the fluctuating nature of the wind source

42 MW Rannoch Power Station, Scotland, UK

Recently upgraded, adding 14000 MWh/year through increased efficiency (83% to 90%)

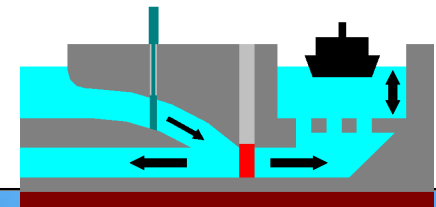
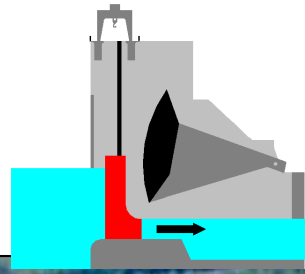
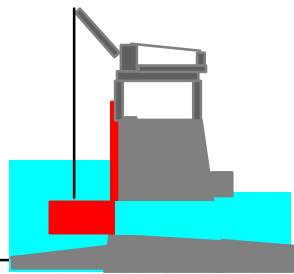


Main uses of dams, by region



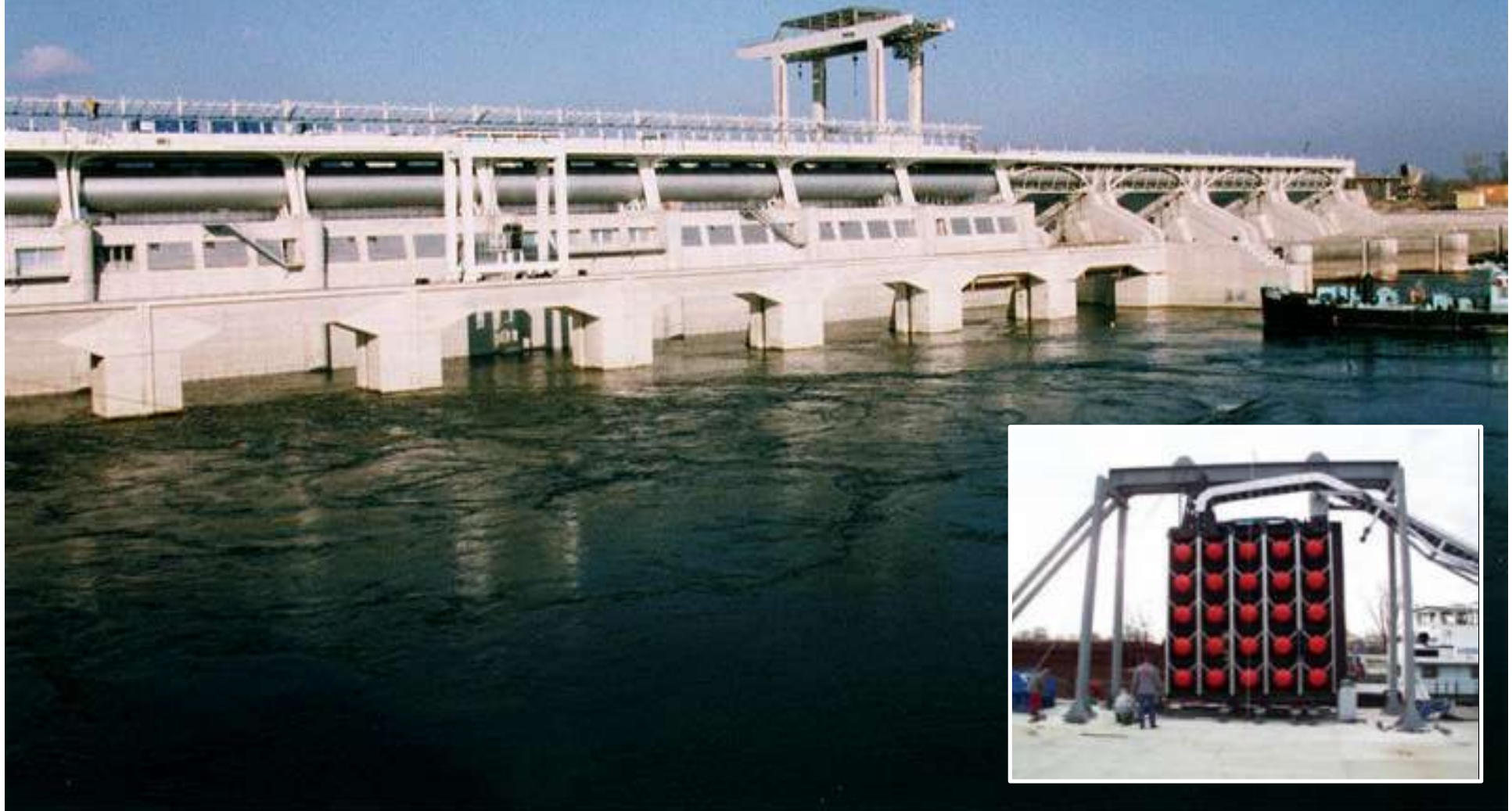
- Flood control
- Multi purpose
- Irrigation

- **Hydropower**
- **Drinking water**
- **Other**



Freudenau, Danube, Austria

Where the navigation system incorporates a HYDROMATRIX module
25 units of 200kW each, generating 3700 MWh/year
(in addition to the substantial production from the main hydropower plant)



Hydropower's carbon offset

By supplying 19% of the world's electricity, hydropower currently offsets 2.1 billion tonnes of CO2 emissions each year.*

If developed, the remaining realistic hydropower potential would offset a further 7 billion tonnes.

Year after year, this would be equal to saving:

- twice the annual emissions of all cars on the planet***
- some 37% of current total world emissions***

*See IHA fact sheets launched at COP9



Peñas Blancas, Costa Rica:
880,000t CO₂ – CDM
Dutch Government, new plant: 35MW



Chacabuquito, Chile
2,800,000t CO₂ – CDM
Prototype Carbon Fund
new plant: 26 MW

Iron Gates, Romania: 1,700,000 t CO₂ - JI
Dutch Government, upgrading: 59 MW

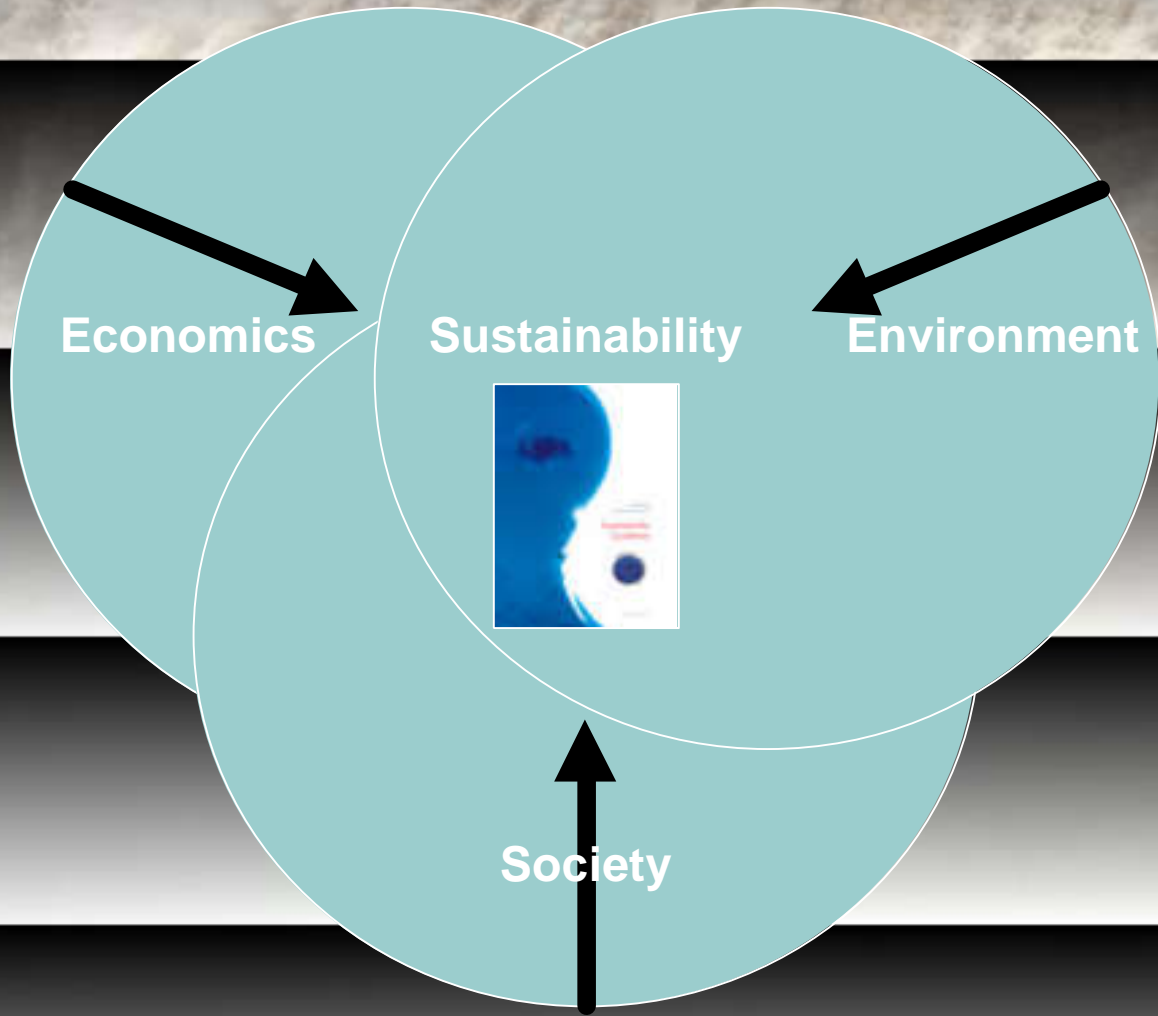


“We recognize the role of hydropower as one of the renewable and clean energy sources, and that its potential should be realized in an environmentally sustainable and socially equitable manner.”

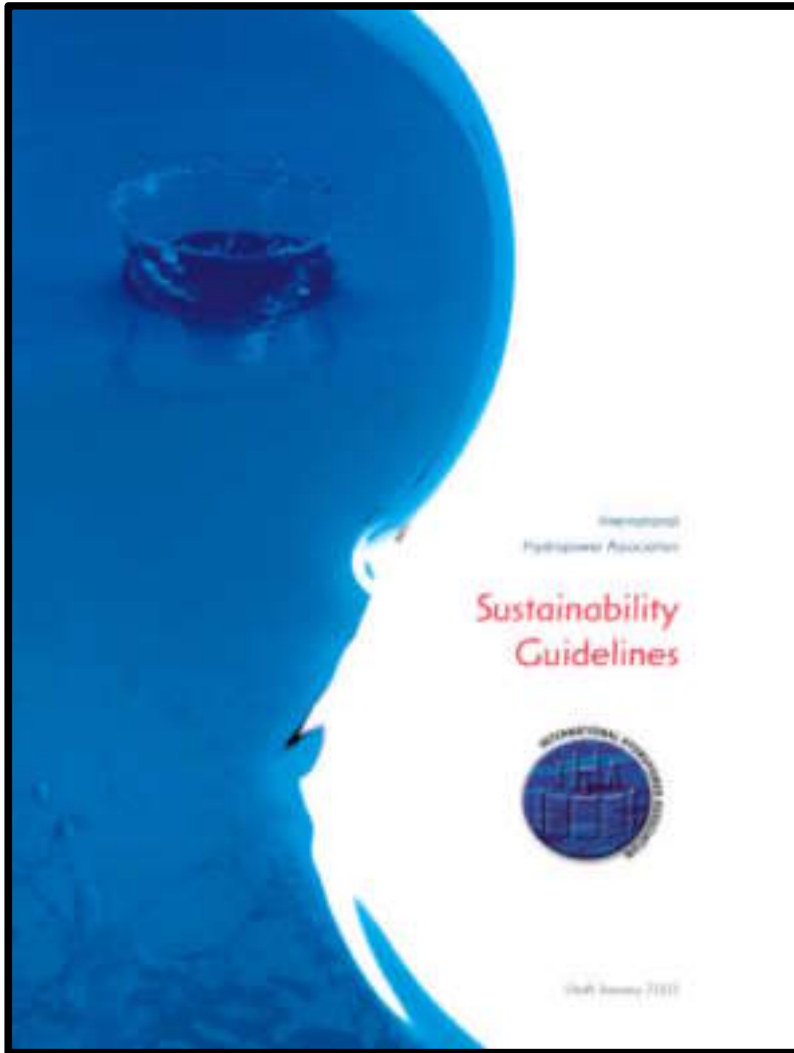
Ministerial Declaration of 170 Countries, World Water Forum, Kyoto 2003

“UNEP is no longer concerned by the small or the large, but the well planned and well managed.”

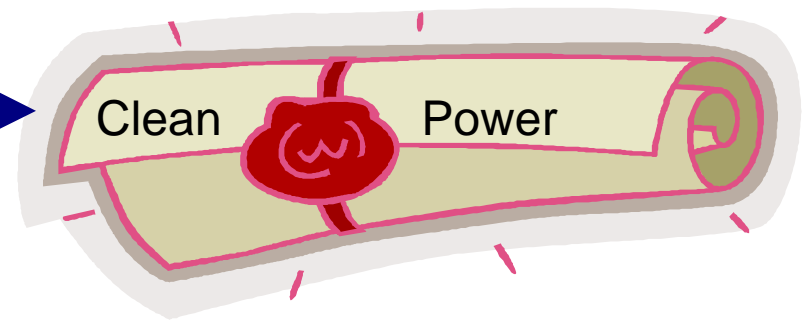
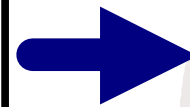
Dr. Klaus Töpfer, Dams & Development Forum, Geneva, September 2003



Hydropower Sustainability Guidelines



CDM / JI



Monday evening buffet dinner

Hydro's contribution to the Kyoto targets

Hydropower: mitigating and adapting to climate change

Ms M. Truchon, IHA Vice-Chair, Environment

A developing country's perspective

Mr F. Kaliisa, Permanent Secretary of the Ministry of Energy and Mineral Development, Uganda

Financing hydropower

Mr J-M. Devernay, IHA Vice-President and Chair, Finance & Economics

Hydropower and the Kyoto mechanisms

Mr W. Wutscher, General Secretary, Federal Ministry for Agriculture, Forestry, Environment and Water Management, Austria

Hydropower and sustainable development

Hon Mr P. Rae A.O., Chairman of the Australian Round Table for Renewable and Sustainable Energy

Monday 8 December, 18.00-20.00, Pescara (BINGO) Room, Fiera Milano



www.hydropower.org

