



Exploitation of this potential while protecting ecosystems and the interests of the local populations is a powerful tool in reducing poverty and combating climate change, provided that it is overseen by a governance mechanism or an authority which lays down explicit and precise management rules. This need for clear rules and a system of governance is particularly keenly felt for transboundary basins and infrastructures.

Major hydro-electric structures could also possibly help reduce natural hazards (flooding, low-water), improve the security of water supplies and make river navigation possible.



**COMMITTED
TO WATER FOR
THE WORLD.**

Construction of the Nam Theun 2 hydro-electric project (1070 MW) will be completed at the end of 2009

It will produce 5.6 billion kWh per year of clean energy, avoiding the generation of 3 million tons of CO2 emissions every year.

Laos is committed to using the 2000 M\$ of revenue it will receive for the duration of the concession to socio-economic development programmes, thus increasing GDP by more than 3%. Improving the living conditions of the local populations as well as conservation of the forest and of catchment basin (4000 km²) biodiversity are an integral part of the project.

France is currently working on a “sustainable hydroelectricity charter” with the stakeholders (energy producers, environmental NGOs, the state, local governments) allowing for a 10% increase in the hydroelectric production, which today amounts to 90% of the renewable energies. This charter aims at developing infrastructures while restoring the ecological continuity of the streams.

Mobilising financing for the water and energy sectors by means of public-private partnerships

Many countries are today faced with a shortage of financial resources (and sometimes human resources), for securing their water and electricity supplies (dams, dykes, water transfer structures, desalination plants, hydro-electric plants, high-voltage lines, etc.). For hydro-electric generating systems, from 10 to 20 billion € per year would need to be mobilised over the coming decades.

In partnership with the public sector, the private sector can contribute to the development of these infrastructures through provision of funding and industrial know-how.

The French experience of the Public-Private Partnership – PPP

This involves a system of hydroelectric concessions, the creation of Mixed Economy companies, agreements between the electricity producers, the local or regional authorities and the public organisations involved in water management. For example, the State chose to develop the wide-gauge Seine-North Europe canal (3.5 billion Euros) in the form of a PPP.

TOWARDS A BETTER MANAGEMENT OF ENERGY FOR WATER AND WATER FOR ENERGY

Four priorities:

- To coordinate policies to achieve savings in both sectors and to better the management of water resource
- To integrate water and energy in planning and land use policies
- To invest in renewable energies, in particular hydro-electricity
- To develop public-private partnerships to spread out the benefits and the risks

1.6 billion people have no access to electricity
 1 billion have no access to water
 2.5 billion have no access to sanitation.
 The amount of energy and water needed to feed the planet will grow.



Water and energy, essential for life and development, are inextricably linked. In order to achieve the MDGs and preserve our environment, water and energy must be jointly managed and saved.

Water, energy, food and poverty

The availability of water and energy is essential if all the Millennium Development Goals are to be met (combating hunger and poverty, health, education, etc). But when the energy bill rises, the water sector is affected, as is that of irrigation for agriculture.

In Morocco, in the past 20 years, falling rainfall and rising abstraction for irrigation have led to a 20% drop in the volume of water available for hydro-electric power, with electricity production deficits of up to 45%!

The impact of global changes

Demographic expansion, urbanisation and economic growth will lead to increasing demand for water and energy. The traditional energy reserves will become depleted and climate change will aggravate water scarcity problems.

Water for energy, energy for water

Water is essential for the extraction of fossil energy (coal, oil, natural gas), for the production of electricity and of agro-energy (wood, agro-fuel crops) and for hydro-electric power. At the same time, energy is necessary for pumping, irrigation, transport, treatment and purification of water.

The two sectors should explore the creation of indicators of performance and assessment of the "water footprint" on energy and the "energy footprint" on water, including in terms of quality.

In France, the creation in 2007 of the Ministry for Ecology, Energy, Sustainable Development and Spatial Planning is a clear sign of the will to improve the coordination of water and energy policies.

Making energy savings in the water sector

This involves optimising the energy efficiency of the water sector (fewer kWh consumed / m³ of water used) by reducing greenhouse gas emissions and reusing them to extract their energy potential (sludges, heat energy recovery from waste treatment plants, etc.).

Making water savings in the energy sector

This involves limiting water consumption in the electricity generating plants (fewer m³ of water consumed per kWh produced) by developing energies that consume less water, by reducing the impact of discharges from thermal power plants on water uses and by taking account of the production of hydrocarbons and agro-fuels in integrated water resource management.

Extracting energy from sludges to save energy and combat climate change

Wastewater treatment sludges emit from 15 to 25 m³ of greenhouses gases (methane) per 1000 inhabitants, per day. The quantities produced are particularly high in the agro industry and in the major urban centres. The energy capacity of the recovered gases and sludges can be reused by cogeneration of electricity and heat (see methodologies approved by the Kyoto Protocol).

Governance and integrated management of water and energy

Water and energy policies are rarely well-coordinated and can even come into conflict (irrigation, flood management, electricity production, etc.). Improved governance is required in order to lay the foundations for the sustainable use of water and energy.

To improve the decision-making process, in particular regarding land use planning and development, national (or even international), regional or basin level governance systems are recommended.

OMVS: producing water and energy for development of the member States

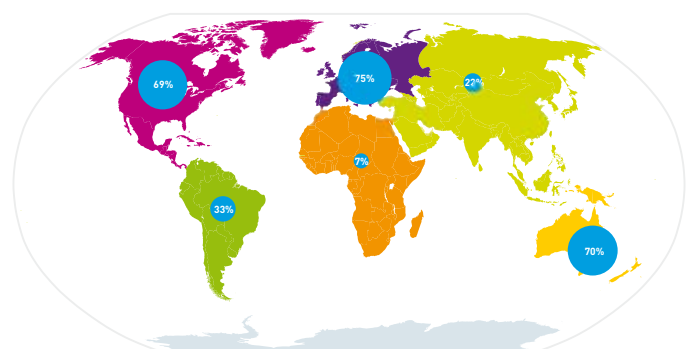
The Senegal River Basin Development Authority (OMVS) is a transboundary basin organisation created in 1972 by Mali, Mauritania and Senegal, expanded to include Guinea at the beginning of 2006. The OMVS has always applied the principle of upstream/downstream solidarity. The upstream zone of the basin which is home to the hydroelectric dams and flow-regulating reservoirs has always exercised solidarity with the downstream areas, in which most of the irrigated crops are grown.

Hydro-electricity and multi-use management of water

Only one third of the world's hydraulic power potential is today exploited. It is under-developed in Asia, South America and above all in Africa, where the needs are greatest. Global hydro-electric production would be a means of avoiding emission of a quantity of CO₂ equivalent to that of all the cars on the planet.

(Source: Observatoire de l'Énergie, ADEME, CEREN, Observ'ER).

Hydraulic power potentials exploited in the world



(Source: IEA Electricity Information, 2006)