Workshop 4 (synthesis): bridge building between water and energy

Professor Klas Cederwall (Chairman)
KTH, 10044 Stockholm, Sweden

Mr Aly Shady (co-chairman)
CIDA, 45 boulevard Sacre-Coeur, Hull, Quebec, Canada K1A 057

Dr Gunilla Björklund (Rapporteur)
GeWa Consulting, Marmorvägen 16A, 75244 Uppsala, Sweden

Abstract Water professionals have often neglected the interrelationship of water and energy, leading to the inefficient use of one or other resource and adverse environmental and/or economic consequences. Bridges between water and energy professionals can and should be strengthened so that the overall objective of improved integrated management of water and energy resources can be achieved.

Keywords Energy management; environmental impact assessment; water management; water resources

Introduction
The water profession has often neglected interrelations between water and energy, including the linkages between the need for access to water to produce energy and the need for energy to access water. These poor linkages have resulted in heavily subsidised electricity for the agricultural sector, which has led to inefficient water use, over-exploitation of groundwater, environmental degradation and adverse economic consequences. Water to produce energy is mainly water use for hydropower but also use of water for cooling. There is a need to balance different water uses and their consequences and impacts, social as well as environmental. New water use projects are likely to be more energy-intensive. The workshop dialogue focused on how the bridges between water and energy professionals can be strengthened and on how production and use of electricity and water can be optimised. The overall objective is improved integrated management of water and energy resources.

Bridging competing interests on energy and water
The discussion showed the direct linkages between population expansion and increased extraction of groundwater, which for many areas is resulting in an extended use of energy. As the pumps that are used for groundwater withdrawal very often are energy consuming pumps, there is a direct link between (periods of) water scarcity, increasing energy consumption and decreasing access to water, for food as well as for domestic use. Decreasing access to water thus also has a clear link to human health and other social dimensions. This is further accentuated by the declining water quality that is closely linked to the decreasing amount of available water.

It was further emphasised that in resource-poor economies access to water might be in danger because of lack of access to energy. This is true for parts of India. The presentation from Mexico also demonstrated that water and energy demanding activities are not always located in the most water abundant areas but are sometimes concentrated where the economic outcome might be highest, at least when the economic balance only concerns economic aspects and not water or energy resources as part of that balance. It was
emphasised that water problems are most evident in resource-poor economies, particularly where water is cheap and energy is subsidised.

It was clear that linkages between water, energy and environment are most tense in areas where energy is needed for water abstraction at a larger scale, e.g. in water scarce areas, or where water is utilised for energy production, particularly for hydropower production. In resource-scarce economies the environment might be in danger when water and energy are directed towards food security or drinking water supply. The presentation from Sri Lanka showed the necessity of a thorough EIA including investigations of alternatives to ensure best use of resources, water as well as energy and the environment.

National policies for integrating water and energy resources in a multipurpose management perspective

The presentations from different countries emphasised that existing national policies do not to any substantial degree include the interlinkages between water and energy. This was seen as an obvious communication problem. In California as well as in Brazil water transfer implies water trading where the interlinkages between water and energy need to be part of the policy. In other cases such as Lithuania, where hydropower is a dominant part of energy production, national policies for integrating water and energy certainly include such aspects. The management perspective is however very seldom a multi-purpose perspective. And there is often a lack of strategic planning linked to policies related to the interface between water and energy.

It was also agreed that the integration of water quantity/quality and energy management systems is not optimal for any of the countries that were discussed. The final dialogue therefore concentrated on suggestions for bridge-building between water and energy management structures to reach a more effective linking of different aspects related to water, energy, environment and social needs in society.

Suggested steps towards better balanced integrated systems for water and energy planning and management

Capacity development was regarded as the most important instrument. There is a need for capacity building and inter-departmental integration for professionals, experts and civil society working in the water and energy sectors. These categories, including those working at field level, at management level and in policy planning positions in federal and state government need to be aware of, and made equipped to act in, issues and problems affecting both these sectors. The interlinkages between the two sectors need to be emphasised, understood and integrated in respective planning processes.

It is important to achieve the most balanced and best possible integration between water/energy and environment, and to integrate environmental and social aspects in water projects in the energy sector or energy projects in the water sector. To achieve this it is important not only to initiate Environmental Impact Assessments early in the process but also to include full cost-and-benefit analyses in the economic accounting.

Multidisciplinary committees could be set up at project as well as at different governmental levels. These committees should include expertise in the different sectors, experts who are open-minded and able to act for integration of different aspects at all levels.

There is a need to pay attention to the fact that integration between water and energy sector aspects might vary according to scale. Decentralisation of planning to “the lowest appropriate level”, which could be at project level, might therefore be the most favourable solution for integrated water and energy planning.

The workshop suggested that the subject should be included on the agenda for subsequent Symposia and that energy experts should be invited to foster a richer and more balanced debate.