



# Policy Recommendations and Research Projects

These recommendations were developed by the participants of the COST Exploratory Workshop 'The Energy-Water Nexus: Managing the Links between Energy and Water for a Sustainable Future' with a view to guiding thinking in both the policy and scientific domain and to achieve integrated, and therefore sustainable, policies.

## Introductory remarks

The links between water, energy and climate are important and complex: energy production requires vast quantities of water, and supplying water requires significant amounts of energy. Energy production and the CO<sub>2</sub> emissions deriving from it is a major driver of climate change and, conversely, climate change has a strong impact on both the availability and quality of our water resources, and on the types of energy supplies that are environmental and economically feasible.

Despite these links, in existing policy frameworks energy and water policies are developed largely in isolation from one another - a fragmentation which is seeing erroneous developments in both sectors. Furthermore, policies adopted to tackle the challenges of climate change have the potential to produce technological and management decisions that exacerbate the energy-water nexus.

The evidence of a changing climate in Europe and elsewhere is driving extensive and fast policy reform in the energy and climate sectors but policy-makers are ill-equipped to make informed decisions based on empirical research and a comprehensive risk assessment: there is no coordination between the water and energy sectors and even less between the related sectors such as agriculture, forestry, trade and mining.

Thus, at the heart of the problem, in Europe and elsewhere, is a lack of policy integration: the energy, water and more recently 'climate' sectors are highly developed within themselves but only limited effort is made to account for, and manage, the extensive links between them. This lack of integration and coordination is the case not only between policy-makers, but also between scientists of different disciplines and sectoral expertise, and between scientists and the policy-makers they are supposed to inform.

COST Exploratory Workshop

**The Energy-Water Nexus:  
Managing the Links  
between Energy and Water  
for a Sustainable Future**

Brussels, 19-21 January 2009

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## Questions for Policy-Makers and Recommended Action

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### The First Four Steps to Achieving Sustainable Energy and Water Security

1. Is your region currently energy and water 'secure'?
  - a. Review the carrying capacity (environment and social dimensions included) of a given region/state in relation to water supply and energy production - is the region overcapacity, approaching capacity, or does it have spare capacity?
  - b. After completing (a), review (ideally collaboratively with other jurisdictions and stakeholders) of:
    - i. all data needs, availability, gaps, and quality;
    - ii. other relevant jurisdiction's available data sets and data-collection methodologies with a view to filling gaps;
    - iii. other relevant jurisdiction's institutional arrangements and regulatory frameworks related to the energy and water sectors;
    - iv. identify key stakeholders for future planning processes.
2. Will your region be energy and water 'secure' in the future? Have you identified energy-water mix goals for the coming years?
  - a. Undertake basic scenario analysis that integrates *existing* water and energy forecasting data for a given region/state with *available* data on energy and water foot-printing.
  - b. Having identified the dynamics of the 'energy-water mix' of your region, link available projections of climate and other pressures/changes to ascertain the risks, vulnerabilities, and resilience of relevant social systems.
3. What policies currently weaken your region's energy and water security or exacerbate water or energy shortages?
  - a. Review *existing* policies to identify where negative incentives or positive synergies may exist, what the key drivers are, and, where possible, quantify the potential economic impact of removing negative incentives and adopting positive ones.
4. What strategies or policies can you employ to make your region more energy and water secure in the face of greater energy and water scarcity and to adapt to changes in energy generation or water supply?
  - a. Promote the use of *existing* or emerging technologies that exploit the potential for more efficient, cost effective, sustainable and local closed-loop solutions e.g. sanitation, by extracting energy from biogas and reducing energy and/or water foot-prints as a result.
  - b. Review the potential for certification and labeling of embodied water and energy use on all products, and engage with existing communities to do so (i.e. Water Footprint Network, Water Stewardship Initiative).
  - c. Consider valuation mechanisms (ecosystem services) that can be used as drivers for more sustainable use. Consider how to internalize externalities (environmental and social costs).



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## Research Gaps, Research Projects and Evidence Collection

A key conclusion from the workshop was the need to undertake international comparative studies to identify 'better-practice' initiatives that can be disseminated across the policy, energy and water communities. The following represent possible elements of a broader research project or they can be stand-alone projects as appropriate.

### Project 1: Integrating climate-energy-water and related interactions into existing planning

- A. Comprehensive analysis of existing regional development planning to ensure that it accurately takes account of the energy-water nexus (including links to land-use, transport policy, industrial policy, international trade etc.) This project would build on existing projects in specific countries.
- B. International, comparative project reviewing river-basin planning in several jurisdictions to assess the extent to which energy and water are incorporated in planning, best (or worst) practices, and opportunities for better integration.
- C. Undertake a review of the likely impacts on water of the carbon trade - how will schemes such as the European Union's Emissions Trading Scheme and other trading schemes effect the water and energy sectors? What are the lessons for other regions?
- D. Develop an integrated model [of what?] that builds on existing planning tools but which better integrates climate-energy-water (and other) links.

### Project 2: Understanding energy and water use and managing demand

Undertake a systematic assessment of "easy wins" and "no regrets" policies in energy and water demand, analysis of how our society uses energy and water, and assessment of where we should target policy for the best savings.

### Project 3: From 'Peak Oil' to 'Peak Water'?

A project to address the disequilibrium between energy and water in terms of price and perception with a view to identifying a 'common currency' or 'language' to speak across the sectors. Related to this, develop an approach to place energy-water considerations in the context of the climate/carbon agenda.

### Project 4: Biofuels and Carbon Off-Sets: Impact on Water Resources

Review and compare the existing research on the impacts on water of carbon off-sets and first and second generation biofuels in different regions, specifically in South Africa, Scandinavia, Australia and Spain. An additional component of interest would be the introduction of carbon credits for water saving and conservation, see developments in California.

### Project 5: Opportunities for De-Coupling

Identify existing projects internationally that successfully couple energy and water generation, for instance, powering desalination plants with wind power.



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## Recommendations to address the skills deficit and encourage cross-learning

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### 1. Series of intensive workshops

Develop a series of intensive workshops for policy-makers, water specialists, energy specialists, agriculturalists, strategic planners and industry representatives on the relationships between the water and energy sectors and to encourage long-term, integrated thinking in strategic planning. This would include linkages to the scenarios suggested in Part 1, above.

### 2. Knowledge-sharing network

Develop a knowledge-sharing network for specialists in the energy-water network and incorporate pertinent organizations i.e. IWA, EWP, GWRC, WFN. Ensure more engagement with the energy sector i.e. IEA, WEC, IPIECA, WBCSD, IRENA.

### 3. Education and communication strategy

Develop an education and communication strategy for the public, professionals and university students that encourages an approach to policy and project planning that integrates water and energy considerations.



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