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Managing the links between energy and water for a sustainable future: preliminary recommendations from the COST-ANU Initiative

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Background: COST-ANU Initiative

- European Cooperation on Science & Technology (COST) and ANU, 2008-2010
- The objectives are to:
  - develop a comprehensive understanding of the links and the potential trade-offs between energy and water security, and, crucially,
  - how policy-makers and government decision-makers can best manage these links in future policies.
- Two workshops - 12 case studies were developed with a view to identifying the following:
  1. types of energy-water (food, climate…) interactions
  2. conflicting and synergistic interactions
  3. barriers to better integration
  4. drivers of better integration
  5. policy recommendations to foster policy integration

Energy-water interactions

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Water Security

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Goal: to avoid conflicting policies in water and energy, and/or in knock-on sectors such as food

Goal: to identify and implement synergistic policies and technologies

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Energy Security

See Zhao, X. (forthcoming) – case study

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Energy-water interactions - some examples

Water Security

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- desal, water and wastewater treatment plants
- decentralized rainwater harvesting
- groundwater pumping
- interbasin transfers

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- population control
- energy conservation and efficiency policies
- better farm management practice
- combine renewable energy + water treatment plants

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- inefficient bioenergy
- badly positioned hydropower
- carbon capture and storage
- groundwater pumping
- inappropriate agricultural crop production

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- hydropower
- bioenergy
- carbon capture and storage
- underground thermal energy systems

Energy Security

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Barriers to better integration and better decisions

1. Poor data and knowledge
2. Inadequate policy processes
3. Fragmentation between existing legislation
4. Cultural legacies and inertia
5. Lack of awareness of the systemic linkages

Initial conclusions:

1. The energy-water nexus is ‘special’
2. Consider all drivers
3. Some conflicts and trade-offs are unavoidable
4. Ignorance results in poor decisions
5. Differentiated responses are required

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Recommendations

Questions for policy-makers and recommended action for achieving sustainable energy and water security:

[could these form the basis of a recommendation to COAG for greater understanding of energy-water interactions in Australia?]

1. **Is your region currently energy and water 'secure'?**
2. **Will your region be energy and water 'secure' in the future? Have you identified energy-water mix goals?**
3. **What policies currently weaken your region's energy and water security or exacerbate shortages?**
4. **What strategies or policies can you employ to make your region more energy and water secure and to adapt to changes?**

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The authors & organizations

- The case studies have been developed from research from a range of academic, government and non-governmental organisations, including:
  - Chinese Academy of Science
  - Environment Agency UK
  - Foundation for Climate and Sustainability, Florence, Italy
  - International Hydropower Association
  - KWR Watercycle Research Institute, the Netherlands
  - Penobscot River Restoration Trust
  - The Australian National University
  - The Nature Conservancy
  - The University of Copenhagen
  - The University of Technology, Sydney
  - The University of Twente & The Water Footprint Network
  - Universidad de Castilla-La Mancha, Spain
  - University of Florence, Italy
  - University of Texas at Austin
  - US Environmental Defense Fund
  - Universidad Politécnica Madrid
  - Instituto Madrileño de Estudios Avanzados (IMDEA)
  - La Federación Nacional de Comunidades de Regantes de España (FENACORE)
  - The Instituto para la Diversificación y Ahorro de la Energía (Institute for Diversification and Saving of Energy, IDAE)

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