



THE AUSTRALIAN NATIONAL UNIVERSITY

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

**Jamie Pittock**

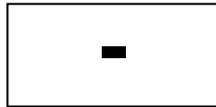
**Fenner School of Environment & Society, ANU**

**21 September 2009**

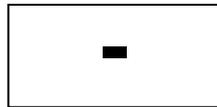
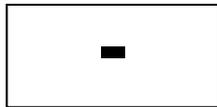
- **European Cooperation on Science & Technology (COST) and ANU, 2008-2010**
- **The objectives are to:**
  - develop a comprehensive understanding of the links and the potential trade-offs between energy and water security, and, crucially,
  - how policy-makers and government decision-makers can best 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

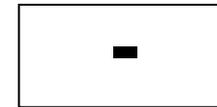
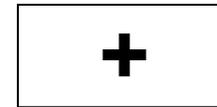
## Water Security



**Goal: to identify and implement synergistic policies and technologies**



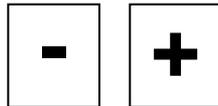
**Goal: to avoid conflicting policies in water and energy, and/or in knock-on sectors such as food**



## Energy Security

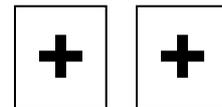
# Energy-water interactions - some examples

## Water Security

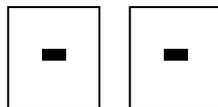


- desal, water and wastewater treatment plants
- decentralized rainwater harvesting
- groundwater pumping
- interbasin transfers

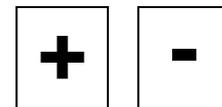
- population control
- energy conservation and efficiency policies
- better farm management practice
- combine renewable energy + water treatment plants



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



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



## Energy Security

# 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**

**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?**

# 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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