Seeking Pathways for Water and Electric Utility Integrated Planning

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Interconnections... It’s why we are talking today...
California Drought Cuts Hydroelectric Generation in Half

- Anastasia Pantsios, October 7, 2014, EcoWatch.com
This presentation presents outcomes from project 4469

Water Research Foundation Project 4469 – Water and Electric Integrated Planning (WEUIP)

Our research approach was designed around the primary goal to:

*Investigate and advise on how water and electric utilities may engage in integrated planning together with an understanding of related benefits and costs.*

Work includes
- Literature review of nexus and planning activities
- Case studies
- Planning tournament
- Concept survey
At the start of our research we heard...

“Energy efficiency just isn’t a priority right now so we don’t see a need to engage local energy providers”

“I’m not sure how we’d balance differing priorities between utilities”

“We’ve been doing our own watershed plan for as long as I can remember without ever including downstream utilities”

“They [electric utility] don’t seem interested in us [water utility] generating electricity”
Water and Electric Utilities have multiple synergies

Both seek to use resources (water or energy) efficiency and minimize cost

Both are facing growing demand pressures with limited or fixed supplies

Both are impacted by climate uncertainties
Both depend on water availability
Likewise, changing energy sector will affect water and electric service delivery (pricing, electricity generation profile)
W&E Utilities are not all that dissimilar

• Similar service needs
  • Need to transport resources to customers
  • Need to ensure adequate resources
  • Need to utilize resources efficiently

“Our long term goal is to meet future demand using the same [water] supplies we manage now”

“ultimately, we’d like exceed all meet water quality measures and do this as efficiency as we can”
Pathways provide opportunities to work together

Synergies and common paths utilities can use to work together

Electric Utility Systems
- Generation
- Transmission
- Wholesale
- Distribution
- Retail
- Cooling
- End User
- Generation (Hydro) and cooling

Water Utility Systems
- Water Treatment
- Distribution
- Wastewater Collection
- Wastewater Treatment
- Reuse Distribution
- Recycling

WaterRF Project 4469 - Steve Conrad
Exploring these pathways through a Joint Utility Planning Tournament

Simulation gaming exercise
Teams of multi-disciplinary stakeholders

- **guided** through several integrated **planning scenarios** set in a **fictitious city** and region
- Discuss and **develop an integrated water and electric utility plan** consisting to meet the goals of the in both the short and long term.
Securing water supply futures

- declining water supplies affecting drinking water, hydroelectric generation, and coal generation cooling

- *prepare a strategy for sustainable management of water over the next 20 years*
Clean energy regulations (CO₂ emission limits)

- Federally imposed regulation of carbon dioxide (CO₂) reducing electric generation capacity from 10% to 25%
- prepare an integrated water and energy transformation plan for the next 10 years
Tournament outcomes

Overall participants enjoyed and commented on the enhanced discussion that took place during the Denver 2014 tournament.

- Key discussion points included:
  - **Language and terminology** between water and electric utilities
  - **Incompatible** political and regulatory **environments**
  - **Differing viewpoints** on how customers/public view water and electric resources
    - *Water viewed more as a right than electricity*
  - **Lack of public awareness** of the linkages between water and electric service delivery
  - Strong **history of silo’ed** operations
Industry survey validated findings and suggested priorities

105 responses across the United States, Canada, and Australia provided feedback on key water and electric utility integrated planning themes.
Perception of the greatest opportunity for WEUIP

Greatest Opportunity for WEUIP

- 48.8% retail, or end-user management
- 37.5% energy generation
- 13.8% electric power cooling
Benefits of water and electric utility integrated planning

More agreed upon benefits:

- “Provides water and energy savings”
- “Enhances communication among water and electric sector professionals”
Potential of programs supporting WEUIP

High potential for “Joint water and electric utility operations planning” and “Joint water and electric utility demand management programs”
Many initiatives would require effort including significant effort for “Joint water and electric utility regulations” and “Implementing a regional water and electric coordinating body and process”
Map of potential to effort to identify priorities

Mapping of POTENTIAL to LEVEL OF EFFORT of WEUIP initiatives

- Joint water and electric utility research on efficiency
- Joint water and electric utility pricing and planning
- Joint water and electric utility regulations
- Joint water and electric utility demand management
- Programs focused on expanding renewable energy
- Joint water and electric utility investments in renewable energy
- Joint water and electric utility investments in electric energy
- Implementing a regional water and electric energy strategy
- Joint water and electric utility programs in cities and towns
- Integrated Land Use Planning programs in cities and towns
- Public education of the energy embedded in water
- Professional education of the energy embedded in water
[Public and] Professional education of the energy embedded in water, and the water embedded in energy

Map of potential to effort to identify priorities
Joint water and electric utility regulations (e.g. program evaluation criteria, guidelines, mandates, restrictions, policy targets)
Other high potential to low effort programs

- Joint water and electric utility programs on internal water & energy reduction
  - e.g. leak management, transmission loss reduction
- Joint water and electric utility demand management programs
  - e.g. devices, incentives, energy and water efficiency programs, joint metering, customer awareness programs
Some differences in perceived benefits and effort between utility sectors

- **Water**
  - See more benefit in integrated metering
  - See greater potential in integrated demand management programs

- **Electricity**
  - See greater potential in regional water and electric coordinating bodies and processes
  - See more effort required to minimize water and energy losses internally
  - See more effort required to educate professionals on embedded water and energy in systems
Key findings

In general, cross-utility partnership and planning is not as common as expected

Demand management is driving electric utilities to partner with water utilities to achieve non-network alternative solutions

Alternative water supply sources from wastewater recycling or stormwater capture and reuse are being used to diversify water supply sources, and reduce demand for energy intensive water supplies

Alternative water supply options are creating opportunities to integrate with land use planning and promote energy and water efficient building and land use designs
Key findings

- **Significant and recognized benefit** and effort present encouraging joint planning
- **Cost effectiveness is highly regarded in both sectors**, especially in privately owned utilities (energy sector dominant)
- **Water security is a strong driver** for integrated planning and many jurisdictions are looking at joint sponsored initiatives for end use efficiency
- **Integrated planning practices** (Australia, California, etc…) is considered a vehicle for encouraging joint planning efforts, but not a requirement

Still considered time consuming and difficult to bring multiple partners to the table/project
Thank you

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Project website:

http://www.waterrf.org/Pages/Projects.aspx?PID=4469