

EWN Needs Assessment Workshop
West Workshop - Sessions 3 and 4
Group A - NEEDS

Dean Richards – Richard Labs	Ernie Avila – Northern CA Salinity Coalition
Mary Johannis - BPA	Harvey Boyce – AZ Power Utility
Dan Seligman - Columbia Research Corp.	Ronnie Cohen – Natural Res. Defense Council
Eliza Jane Whitman - Inland Empire Util. Agency	Wayne Dyok – MWH Sacramento, Hydro power
Jaralyn Beek - Reclamation	Paul Jehn – GWPC
Gary Woodward – Univ. of Arizona	Nykole Littleboy – UT Energy Program
Al Dietemann – City of Seattle	Philip Murphree – Powder River Coal Co.
Sherri Thomas – Utton Center	David Stewart – Stewart Environ. Consultants
John Kounts – WA Pub Utilities	Reagan Waskom – CO WRRI
Larry Morandi – Nat. Conf. of State Legislatures	Lois Wright – Sacramento Mun. Utility District
John McCray – Colorado School of Mines	Ed Baruth - AWWA
Kenya Crosson – BNL	Mike Sale - ORNL
Jean Lee – SNL	Mike Hightower - SNL
Del Garner - BYU	John Boysen –
Tom Acker - NAU	George Diwachak - BLM

Group A – Session 3 - Needs

Problem: Reliability of reclaimed water for industries, refineries, power generation

Needs: Produced water

- Explore potential uses across country
- Bring all groups together to assess how to allocate and use this water (state by state issue as well as transboundary issue)
- Develop best practices document for treatment, use, and education of public of benefits
- Technologies to handle and dispose of concentrate and residuals
 - Use brine for beneficial use
 - Better treatment for coals fines, metal membranes, to improve treatment for discharge, and technology transfer
 - Need funding for demos, tech transfer to reduce risks
- Modeling to show impacts of disposed concentrate
 - Including reinjection aquifer availability
- Understand TDS impacts and materials to handle
- Better science-based policies on produced water use
 - Better understanding of produced water soil/quality interactions
 - Has applications for irrigation, rangeland applications
 - Include other regulatory groups
- Need roadmap for each state or users guide on how reclaimed water can be used, how it will be counted, etc.

Needs: Municipal reclaimed water

- Develop best practices document for treatment, use, and education of public of benefits
- Technologies to handle and dispose of concentrate
- Understand TDS impacts and materials

- Better science-based policies on reclaimed water use and health impacts, especially for aquifer storage and recovery
 - Energy issues, health issues
- Need roadmap for each state or users guide on how reclaimed water can be used, how it will be counted, etc.
- Put in purple pipe in all new developments
- Encourage direct use of gray water – needs science to assess health issues, and identify technologies to allow this to be used
 - Grow biomass for energy
 - Incentives to builders like Arizona to plumb for waste-water use
 - Need to change building codes
- DOE use national labs to work with other agencies and coordinate applications

Need: Co-locate water treatment plants with power generation

- Enables the power plants to use the water as an emergency supply
- Does not require an emergency supply of fresh water and allows fresh water to be allocated and used for other purposes

Problem: Lack of information to address expectations and application of renewables

Need: Conduct studies of impacts, benefits, and costs of high penetration of renewables

- Impacts of intermittencies
- Identify contingencies, modeling, storage, etc. to address problems
- Studies to identify practical application of renewables
- Studies of real applications of sector – where renewables will satisfy water and electrical needs of each sector – i.e. water transmission, agriculture, etc.

Need: Massive improvement of R&D to renewables

- Improve efficiency to 30 %, lower cost
- Improve cost intensity, cost per unit power, transformational technologies
- Solar water heating and better applications to housing

Need: Evaluate a national loading order

- Give it a numerical value on priority as well as a percentage

Need: Tidal Power – Ocean power

- Some areas might need to be revisited – wind generated waves

Need: Education and demonstration outreach of renewables

- Follow EPA ETV program approach for evaluation, testing etc.

Need: Run of flow hydro

- More study and design of micro turbines for low head power
- Permitting process is causing a problem with FERC
- Consider how to replace reduced hydro with other base load

Need: Better integration of intermittent renewables

- Energy storage research
- Research on tying renewables to grid
- System design of hybrids

Need: National energy conservation policy

Problem: Transmission constraints for using less water efficient technologies

Need: Transmission for remote renewables

- Permitting issues a problem
- Wind big in remote areas – is a national resource?
- Change national power transmission organization
- Incentives or tariffs for investment
- Reduce losses in transmission – tradeoff of different approaches i.e DC line, high KV AC lines
- Oil and gas pipelines need to be considered also
 - Primarily political issue

Problem: Lack of data on availability of GW for electric power generation

Need: Better understanding of GW resources

- Better info on water quality, quantity,
- Better modeling of surface water and gw interactions and yields
 - Better understand yield, reduce uncertainties in identifying yields
 - Requires better monitoring and data – real-time data
 - Add better geochemical information

Need: DOE, DOI, industry, universities need to better cooperate on water issues with states

- National consortium for improving gw modeling
 - Use oil and gas info approaches
 - Use supercomputers from labs
 - Develop easier methods to use models
 - Data base exists that could be mine for info on brackish and fresh water
 - Reservoir engineering
- Coordinate efforts with interagency task force on water data analysis

Need: Develop approach to appropriate data base management and use

- Identify isotopic techniques that can help identify quality
- Develop consistent data base that can be used for this and can talk to each other

Problem: Need streamlining, lack of consistency, lack of good science to drive permitting

Need: Permitting to encourage competition between energy providers

- Rail, versus pipelines, vs. transmission lines

Need: Develop offices for permit assistance

- Address issues with different energy type permits
- Address issues of different water type permits

Need: Develop a model compact for energy development

- Follow Utton Center model approach to transboundary water compacts
 - Consolidate overlapping of permitting
 - Follow DOI – Enterprise Architecture Process, Framework on Water Management

Need: Better federal direction on ranking of priorities for water and energy

- Develop a standard weighting matrix and process
- Include externalities and metrics– value of energy, impacts of energy on water, environmental, risks, etc.
- Develop basin plans – based on system analysis

Problem: Hydro issues- spill vs. power, trust and licensing

Needs: Better understanding of efficacy of spills

- More research on science-based information
 - Improvements to reduce fish mortality
 - Assess factors impact aquatic environment and look at different approaches – assess limiting factors
 - Modeling impacts of loss of hydro in future on environment, CO2, global climate change, other water loss
 - Use information to drive actions
 - To do this requires a systems dynamic model for decision support
- Need more demonstration, deployment efforts to evaluate risks
 - Better understanding, better outreach of information to show benefits

Problem: Matching water price with water value

Need: Analysis of water and energy impacts of reduced water and crop subsidies

- Needs to include impacts on food supply, environment, national security, societal changes, economy
- Will require system level decision support tool

Need: Analyze how water marketing and energy pricing structures impact energy and water efficiency

Need: Better understanding of water markets

Need: Better understanding of externalities – instream flow, benefits of irrigation, environmental impacts, and

Need: Need to quantify all water rights – identify consumptive use limits

- Quantify losses - infiltration, evaporation-transpiration, conveyance losses

Need: Identify worth of conservation

Need: Water pricing to escalate

Problem: Food production

Need: Understand water change impacts on food production and security

Problem: Equivalent program to Energy Star to drive energy and water conservation

Need: A national water efficiency program

- Use incentives for water conservation
 - Make efficiency minimum a requirement for revolving funds
- Include education and outreach
- Regional and local recognition
 - Incentives to encourage municipal and utilities to participate
 - Rewards for good waste water quality
- Technology research to improve water and energy conservation technologies
- Allow water saved to be sold as a commodity

Need: Mechanism for utilities that save water to get a credit for energy savings

- Include conveyance, etc. in the credit

Need: Technologies for smart control of water

- Important for domestic landscape for easy programmable control
- Better monitoring of hydrologic events so do not send irrigation water at wrong time and water lost or used inappropriately
 - Load forecasting for irrigation loads

Need: Determine candidate technologies for hot water handling and use

- Standards for design and Utilization

Problem: Lack of national coordination of energy and water interrelations issues

Need: Better communication of policies

Need: Coordination of energy and water planning

- Lack of fast tracking of energy and water permitting
- Planning at regional or state levels

Need: Insure limitation of federal barriers to use of new technologies

Need: Site power plants near desal and water reuse plants

Problem: lack of understanding of instream flows needs

Need: Define, provide, and protect instream flows

- Provide science-based information to identify and define flows needed
 - Monitoring ecological impacts
 - Right flows for life stages, timing, water temperature,
- Funding mechanism to acquire instream flows

Need: Identify needs and manage water for species of interest by basin ASAP

Problem: Climate change and climate variability

Need: Need to analyze regional climate change probabilities and implement into regional planning

- Include uncertainties in planning
- Better management of flood plains
- Better understand aquifer storage, quality, how much can you get back,

Need: Reduce uncertainty of climate change through better modeling

Need: Better understand watershed changes and impacts on water

Need: Take information on climate models and disseminate to regions and identify projections of water availability

Need: Utilize concepts of contingent water rights

Need: Quantify reduction of green house gases by use of energy and water efficiency technologies

- Plan for variability
- Encourage regional CO₂ trading to reduce green house gases