12/9/10 ACEEE/AWE Water-Energy Nexus Blueprint Workshop Raw Output

In the concluding hours of the December 9 workshop, participants wrote their high priority blueprint items, and then posted and organized them on flip chart paper. They prioritized all of the postings using a maximum of 5 dots per category per participant. In addition, participants posted caution dots in areas where they thought some element of mindfulness or caution deserved noting. These pages represent the raw compilation of the output from that exercise. The draft blueprint grew from a several-week-long distillation of this exercise.

POLICY

Theme: **Decoupling** **DOTS: 29** **CAUTION DOTS: 1**

Theme: **Standards** **DOTS: 25** **CAUTION DOTS: 0**

Categories:

Create water and energy efficiency standards
Increase collaboration

Theme: **Codes** **DOTS: 24** **CAUTION DOTS: 2**

Categories:

Integrated Codes
New Construction Codes
Maintenance Codes
Land Use and Planning Codes
Draft Codes

Theme: **Federal Incentives, Loans, etc.** **DOTS: 24** **CAUTION DOTS: 2**

Categories:

WRDA Reauthorization
Performance-based tax incentives
Energy & water-use reductions in Federal buildings
2-3-year policy analysis
Increase collaboration among EPA, DOE & States
Research the impact of policies on demand
Require reviews of energy & water efficiency prior to any project funding
Add water to existing energy efficiency program funding

Theme: **Embedded Water/Embedded Energy** **DOTS: 24** **CAUTION DOTS: 0**

Categories:

Smart Meters
Allow energy utilities to claim water savings and vice versa
Ban “pump and dump” systems
Support a shift to taxing resource consumption

Theme: **Green Infrastructure** **DOTS: 10** **CAUTION DOTS: 1**
Categories:

Sustain the green infrastructure requirement in the state revolving loan fund
Re-define "green infrastructure"

Theme: **Integrated Resource Planning** **DOTS: 6** **CAUTION DOTS: 0**
Categories:

Develop whole system planning requirements
Consider water and energy efficiency as sources of supply in planning

Theme: **Rates and Bills** **DOTS: 4** **CAUTION DOTS: 0**
Categories:

Change feedback loops for purchasing of resources
Set prices to reflect value
Include externalities (greenhouse gases) in rates

Theme: **25 – 50-year infrastructure time horizon** **DOTS: 3** **CAUTION DOTS: 1**

Theme: **Environment** **DOTS: 3** **CAUTION DOTS: 0**

Theme: **Financing** **DOTS: 2** **CAUTION DOTS: 0**
Categories:

Create a finance/investment model for PACW + PACE
Create financing mechanisms for green infrastructure

RESEARCH

Theme: **Benchmarking/Baselining** **DOTS: 32** **CAUTION DOTS: 1**
Categories:

Identify BMPs, needs for future study, analyses and definitions for Green infrastructure and low-income development
Create a uniform data format and metrics for surveys
Conduct a baseline evaluation of existing energy/water programs
Create an E-W benchmarks rating systems for residential, commercial, and multi-family buildings.
Develop a baseline of energy use by water and wastewater utilities and vice versa
Develop a whole building rating system similar to HERS
Develop a standard "business case" model

Theme: **Integrate water into existing energy research** **DOTS: 28** **CAUTION DOTS: 0**
Categories:

"Just add water"
Integrate water/energy research programs

Theme: **Embedded Energy** **DOTS: 28 CAUTION DOTS: 0**
Categories:

Develop a consistent "energy factor" for water and "water factor" for energy
Research embedded energy/water in water/energy, including carbon benefits

Theme: **Data Collection** **DOTS: 27 CAUTION DOTS: 0**
Categories:

Integrate water and energy data collection
Incorporate water use into energy audit and rating tools
Use smart meters to provide joint E-W use
Collect voluntary data on usage
Collect regional data on unique W & E constraints
Determine what we "need" to know to move forward
Inventory E-W research to find gaps
Profile successful collaborations

Theme: **Watershed Research** **DOTS: 18 CAUTION DOTS: 0**
Categories:

Develop worst-case scenario watershed modeling case studies looking at cooling water/in-stream/municipal uses
Monitor in-stream impacts of conserved water
Understand how W & E demands play out over major river basins
Examine impact of adding "environmental flows" as a stakeholder in analyses

Theme: **Performance Metrics** **DOTS: 12 CAUTION DOTS: 0**
Categories:

Study conflicting regulations and policies that provide barriers to renewables
Document water/energy tradeoffs for evaporative cooling versus wet and dry cooling at power plant … by region
Monitor water and energy flows through systems, from building scale to watersheds
Stimulate the development of alternative system architectures.

Theme: **Economic/Social Science Analyses – Data & Needs** **DOTS: 9 CAUTION DOTS: 0**
Categories:

Risk of dry periods to energy production
Research non-market values of E, W, and ecosystem services
Focus on consumption reduction
Find the economic price point to shift from a water-cooled to air-cooled power plant

Theme: **Workforce/Economic Development** **DOTS: 7** **CAUTION DOTS: 0**
Categories:

Determine if a certification in energy/water efficiency can be developed
Research job creation and local economic development impacts of planning energy and water together

Theme: **Pricing** **DOTS: 7** **CAUTION DOTS: 0**
Categories:

Find effective ways to decouple water consumption from water rates

Theme: ***Smart Home Monitoring*** **DOTS: 7** **CAUTION DOTS: 0**
Categories:

Use Smart Meters to get end-use information.
Synthesize existing energy/water efficiency information to make it useful: codes and standards, guidance documents, reports
Identify existing/potential funding resources

Theme: **System Flows and Optimization** **DOTS: 6 CAUTION DOTS: 0**
Categories:

Research tradeoff of water and energy saved from efficiency standards compared to increased energy (or water?) for treatment of more concentrated wastewater.
Evaluate the resilience of water and wastewater infrastructure to reduction in flows of 50% and 90%
Document energy and water balances in flows in existing energy and water utilities' systems
Conduct systems research of temporal water/energy use for different pricing schemes.

Theme: **Decentralized Wastewater Treatment** **DOTS: 5 CAUTION DOTS: 3**
Categories:

Research decentralized wastewater systems and their potential for power generation, district heating, nutrient recovery and wastewater reuse

PROGRAMS

Theme: **Collaboration** **DOTS: 40** **CAUTION DOTS: 0**
Categories:

Create utility partnerships for joint messaging
Develop a format to add energy savings calculations to water programs and vice versa
Integrate the end-use efficiency programs of energy and water utilities where common savings opportunities are already well established, such as clothes

washers, diswashers (residential and commercial), shower heads and shower systems, commercial food services
Publish this Energy-Water blueprint widely

Theme: **Integrated Planning Programs** **DOTS: 38** **CAUTION DOTS: 0**
Categories:

Integrate water and wastewater utilities into energy efficiency programs
Establish water/energy efficiency working group to share best practices
Foster competition in water/energy efficiency
Develop interrelated funding program for water and energy efficiency so both "utilities" fund modifications
Develop a national program to educate water and wastewater administrators, managers, and operating personnel on energy efficiency and water use reduction
Develop an integrated energy-water metering system
Develop a retrofit program to convert wet cooling to dry cooling
Build framework for integrated energy, water, greenhouse gas/carbon databanks

Theme: **Joint water/Energy Audits** **DOTS: 30** **CAUTION DOTS: 0**
Categories:

Create dual water and energy audits, rebate programs, education and outreach efforts

Theme: **Replicate Model Programs** **DOTS: 29** **CAUTION DOTS: 0**
Categories:

Inventory model programs combined with campaigns to replicate them
Identify key needs for replicable pilot models, and develop pilot model electric-water-gas programs involving multiple utilities outside California
Synthesize existing academic research to make it actionable to program managers: make the "business case" clear
Enable water and wastewater utilities to assess DOE funds for EE upgrades and improvements

Theme: **Smart Meters** **DOTS: 14** **CAUTION DOTS: 1**
Categories:

Coordinate energy and water standards for joint measurement, dashboards, and data collection.

Theme: **Education and Awareness Programs** **DOTS: 23 red/4 blue** **CAUTION DOTS: 0**
Categories:

Educate utilities on system efficiency opportunities
Conduct a National Consumer Awareness and Education Program
Combine WaterSense and EnergyStar

Train land use planners and engineers or optimizing efficiency via land use/design/planning
Convene educational seminars for policy makers and staffs

Theme: **Standards** **DOTS: 5** **CAUTION DOTS: 0**

Theme: **Climate** **DOTS: 4** **CAUTION DOTS: 3**