El Dorado County Water Agency

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SUBJECT: Workshop on Evaluating/Capturing the Benefits of Renewable Energy for California

On April 12, 2012 the California Energy Commission (CEC), Lead Commissioner on the Integrated Energy Policy Report (IEPR), will conduct a workshop to gather input on public benefits of renewable energy that may not be accurately quantified or sufficiently considered in renewable energy procurement and other energy policies. The CEC notes that the workshop is the first step in implementing the overarching strategy recommended in the *Renewable Power in California: Status and Issues* CEC Staff Report (Staff Report), and is requesting comments from experts, stakeholders, and the general public in evaluating and capturing the benefits of renewable energy for California.

The El Dorado County Water Agency presents the following comments to bring your attention to the immediate, substantial opportunity that small hydroelectric generation within existing water transmission systems in mountain and foothill counties represents toward meeting goals of the IEPR, which include conserving resources, protecting the environment, providing reliable energy, enhancing the state's economy, and protecting public health and safety.

The IEPR and the Staff Report currently only give cursory attention to opportunities for, and benefits of, renewable energy and energy storage in existing raw, potable, and treated waste water transmission (e.g., pipeline) systems. Adding small hydroelectric power generation, expanded water storage (e.g., water tanks), and small-scale pumped-storage operations to existing water systems in the Sierra Nevada and other regions with variable topography can produce more than an estimated 1,000 MW of localized renewable energy, renewable energy storage, and renewable energy balancing. This type and scale (generally 100 kW to 3 MW) of customer-side, distributed renewable energy has many cross-sector benefits and advantages over other forms of renewable energy, including that it:

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- Is a proven technology and industry for which U.S. manufacturing, electric utilities, and California labor are ready to implement today, and it will thereby create thousands of new jobs and rapidly contribute to California's ambitious renewable energy and GHG goals;
- Has a relatively long (40-year) economic life relative to solar and wind (20-year);
- Would be installed at sites with existing infrastructure, with minor environmental effects, and without posing hazards to the public or our natural resources;
- Creates fire protection, fire suppression, and therefore insurance benefits for rural communities that are particularly vulnerable to catastrophic wildfires; and,
- Is a reliable energy source, can support the grid, and can balance intermittent (solar and wind) renewable energy sources.

In short, the CEC's Staff Report greatly underestimates and undervalues the potential contributions of small-scale hydro (with small-scale pumped storage) for existing water systems located in variable terrain. The above public health, environmental, electric grid support, and economic opportunities, benefits, and advantages are further described below.

Health Benefits: Fire Suppression and Air Quality

Installing small-scale hydro in existing water transmission systems does not create the fire risks that are associated with other renewable energy sources, such as solar panels (which are located on or near buildings) and wind turbines (which can create a fire hazard through falling and hot debris). Furthermore, expanding small hydro would greatly reduce the risk and extent of catastrophic fires and damage to public and natural resources through:

- Increased volume and reliability of local gravity-flow water supplies for fire suppression and
- A greater number and geographic distribution of suppression supply sources in rural regions that are at high risk for catastrophic fire events.

The above would benefit many regions of source water supplies throughout California including communities in the Sierra Nevada, Tehachapi and San Bernardino mountain ranges, and the Coast Range. Past and recent examples of catastrophic fire events that could have been mitigated with increased gravity storage in existing water systems include:

- Southern California regions affected by Santa Ana winds,
- Oakland Hills, and
- Angora Ridge (Tahoe).

Environmental Benefits: Water System Related Benefits

The continued success of intermittent or variable energy resources (VERs) (e.g., solar and wind) require that three primary issues be addressed: (1) the need to maintain reliability, (2) the need to contain customer costs, and (3) the need to provide regulatory and financial security for investors and technology developers. While discussions continue regarding the best way to address these issues, small-scale distributed hydro development that expands water storage and adds pumped-storage capability in the water transmission systems would allow utilities to meet the above needs for VERs. For the water purveyors that own the water transmission systems, this would also:

- Increase water delivery reliability and availability for the protection of natural resources,
- Reduce water system energy costs (e.g., off-peak pumping and conveyance), and
- Create new revenue streams with on-peak energy production, off-peak grid loading, and other ancillary (e.g., outage protection) grid services.

Electric Utility and Grid Benefits

Water storage for small hydroelectric peaking generation within existing water systems in mountainous counties, combined with smart-grid controls and operations, could be a substantial source of new dependable, renewable energy to help balance existing and future VER electric grid loads and resources. Other benefits of small-scale pumped storage hydro energy systems include:

- Helping to meet the Governor's goal of 12,000 MW of customer-side renewable energy (RPS-eligible) generation and storage by 2020,
- Increasing distribution grid efficiencies and reducing losses (e.g., placing generation near rural loads),
- Creating dispatchable peaking generation and off-peak grid loading,
- Supporting grid voltage and protecting against outages (local power for rural communities),
- Creating a mechanism to balance non-dependable (VERs) renewable energy sources, and
- Substantially contributing to GHG emissions reduction goals (AB 32).

The Staff Report stresses the importance of renewable energy sources that enhance grid stability. Of the qualified renewable energy sources, small-scale hydro with pumped storage capability is the only source capable of responding rapidly to changing conditions and needs of the distribution grid. With Smart Grid monitoring and controls at the distribution grid level, small-scale hydro installations can supply the ancillary support services needed to greatly improve grid operations and efficiencies as increasing amounts of VERs are installed. It will be a challenge for planning and development of the distribution grid as a considerable amount of small customer-side and wholesale renewables are introduced to the grid. Small-scale hydro generation with pumped-storage capability is a readily available, geographically widespread, and large scale opportunity to support the grid throughout California's foothill and mountain communities.

Economic Benefits: Fire Insurance Availability and Costs

Fire insurance can be cost-prohibitive in some regions, has been cancelled in some Sierra Nevada communities, and in some cases is unavailable altogether where there is a high risk of catastrophic fire. Adding water storage tanks with pumped storage systems in these areas, and having the capability to move water uphill or downhill when and if the water is needed during a fire event, would greatly expand fire protection and decrease the risk of catastrophic fires, thereby protecting valuable public and natural resources. This decreased risk would increase the availability and lower the cost of fire insurance in these regions.

Other Economic Benefits

Retooling existing mountain and foothill water systems in California to include small-scale hydroelectric infrastructure with pumped storage features would create thousands of jobs, greatly increase demands for U.S. manufacturing products and services, and also increase spending and tax revenues from construction in rural counties. The renewable energy and grid support revenue stream would feed back to the communities in which the projects are located, unlike out-of-state sources of renewable energy. As California searches for opportunities to capitalize on its investments in renewable energy, a major focus is warranted on small-scale hydro, which has proven to be cost-effective for nearly a century, is an attractive public infrastructure investment due to its 40-year economic life, and is one of the few non-variable sources of renewable energy that can support our electric grid.

We would appreciate an opportunity to work with the CEC and others on the details of these issues and concepts. Please contact me directly if you have questions on the above or to request a meeting.

Sincerely,



Dave Eggerton
General Manager