

## DOCKETED

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*Comment Received From: Dian Grueneich*

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**Smart cities: enabling municipalities to leverage synergies between water-energy-food nexus through data**

*Additional submitted attachment is included below.*

**CALIFORNIA ENERGY COMMISSION**

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The Energy Commission is currently soliciting ideas and stakeholder input for the 2018 – 2020 EPIC Triennial Investment Plan. For those that would like to submit an idea for consideration in the 2018-2020 EPIC Triennial Plan, we ask that you complete the form below. Submittals are due by **5:00 p.m. on February 10, 2017.**

**Part 1. Initiative Description and Purpose:**

1. Please provide a brief description of the proposed initiative:

Municipal governments will undoubtedly play an integral role in our transition to a low carbon economy and are uniquely positioned to influence water, energy and food systems at the local level. And, in California, the widespread adoption of Community Choice Aggregation (CCA) is expanding rapidly the role of local governments in energy and sustainability initiatives. This initiative would aim to leverage new data streams being collected by cities as part of their energy, water and other disclosure measures and, where applicable, their participation in CCAs, to understand the interdependencies between such systems at the city scale. Once such interdependencies are understood we can design programs and policies that leverage the synergies between water, energy and food systems.

2. What technical and/or market barriers would the proposed initiative help overcome? For scientific analysis and tools, what knowledge gaps would the proposed initiative help fill?

Significant analysis and models have been developed for water, energy, and food systems individually. Additionally, some work has been done at the nexus of all three systems but such work is not data-driven and is not designed for analysis on the municipal/local level. This initiative would extend such work to form a data-driven and integrated analysis framework to understand how programs and policies in one system impact the others and how co-benefits between systems could be gained at the local level. For example, how could data-driven energy efficiency programs and water efficiency programs be combined for certain type of buildings and facilities such that co-benefits can be realized.

**Part 2. Benefits and Impacts**

3. If this initiative is successful, either fully or partially, what would be the expected impact?  
Who are the primary users and/or beneficiaries?

If successful, this initiative would provide a data-driven modeling framework that would enable gauging and quantifying the impact that policies/programs in one system have on the other. This would enable municipalities (primary user) to make informed decisions and leverage the co-benefits of programs for water, energy, and food systems. It could also be used to facilitate a better integrated approach to GHG emission reductions.

4. Describe what quantitative or qualitative metrics or indicators would be used to evaluate the impacts of the proposed initiative:

Quantitative metrics - adoption of municipalities across CA; efficiencies gained from co-benefits between systems

Qualitative metrics - understanding of the interdependencies and impacts among water, energy, and food systems; citizen satisfaction / engagement on issues related to water, energy, food

5. Please provide a list of peer-reviewed references that support the responses for questions 3 and 4. Proposed initiatives that include peer-reviewed references will be given stronger consideration.

Bazilian, Morgan, et al. "Considering the energy, water and food nexus: Towards an integrated modelling approach." *Energy Policy* 39.12 (2011): 7896-7906.

Ringler, Claudia, Anik Bhaduri, and Richard Lawford. "The nexus across water, energy, land and food (WELF): potential for improved resource use efficiency?." *Current Opinion in Environmental Sustainability* 5.6 (2013): 617-624.

Kontokosta, Constantine E., and Rishee K. Jain. "Modeling the determinants of large-scale building water use: Implications for data-driven urban sustainability policy." *Sustainable Cities and Society* 18 (2015): 44-55.

Parshall, Lily, et al. "Modeling energy consumption and CO 2 emissions at the urban scale: methodological challenges and insights from the United States." *Energy Policy* 38.9 (2010): 4765-4782.

Reinhart, Christoph F., and Carlos Cerezo Davila. "Urban building energy modeling—A review of a nascent field." *Building and Environment* 97 (2016): 196-202.

Morgan, Kevin. "Feeding the city: The challenge of urban food planning." (2009): 341-348.

6. (For technologies only) What competitive advantages does the proposed technology solution have over current benchmark technologies? If the technology is beyond the prototype stage, what strategies do you suggest to bring to scale?

**Part 3. Connection to Energy Commission’s EPIC Framework**

Energy Commission staff have developed a draft strategic framework to guide the CEC’s planning and implementation of EPIC across triennial investment cycles. One of the objectives of the draft strategic framework is to communicate a consistent set of priorities for organizing current and future EPIC investments.

7. Please indicate which of the following strategic framework themes you feel the proposed initiative best fits within:

- Advance Technology Solutions for Deep Energy Savings in Building and Facilities
- Accelerate Widespread Customer Adoption of Distributed Energy Resources
- Increase System Flexibility from Low-Carbon Resources
- Increase the Cost-Competiveness of Renewable Generation
- Create a Statewide Ecosystem for Incubating New Energy Innovations
- Maximize Synergies in the Water-Energy-Food Nexus
- Develop Tools and Analysis to Inform Energy Policy and Planning Decisions
- Catalyze Clean Energy Investments in California’s Underrepresented and Disadvantaged Communities

**Maximize Synergies in the Water-Energy-Food Nexus**

If Other, Please Specify