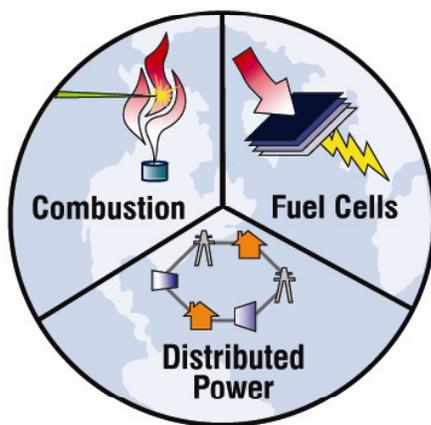


Demonstrating an Integrated Renewable Energy System (RESCO)

**Advanced Power and Energy Program
University of California, Irvine**



February 29, 2012

BACKGROUND

- **UCI RESCO Deliverables**

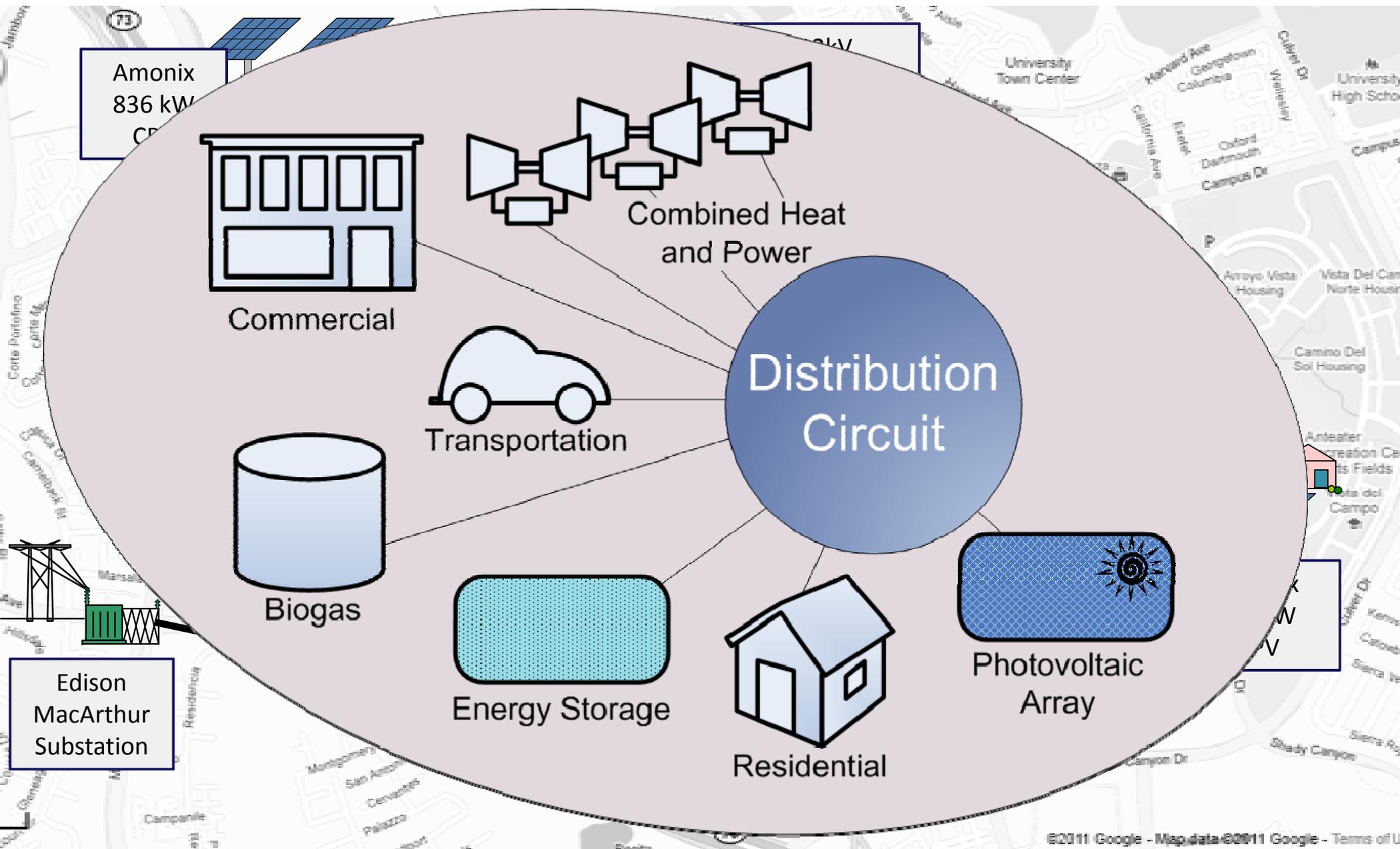
- An energy infrastructure (electric power , transportation, waste, building) roadmap for the UCI community that will maximize the deployment and utilization of renewable energy resources while satisfying reliability criteria, enhancing and sustaining power quality, and minimizing the cost-of-electricity (COE)
- A roadmap for communities who aspire to develop energy infrastructures that maximize the deployment and utilization of renewable energy resources while satisfying reliability criteria, enhancing and sustaining power quality, and minimizing the cost-of-electricity (COE).
- The issues for policy makers and industry leaders that must be addressed to facilitate the implementation of renewable-based energy secure communities throughout the State.

- **UCI RESCO Schedule**

- Start Date: 1 October 2010
- End Date: 30 September 2012



RENEWABLE DEPLOYMENT



RENEWABLE DEPLOYMENT

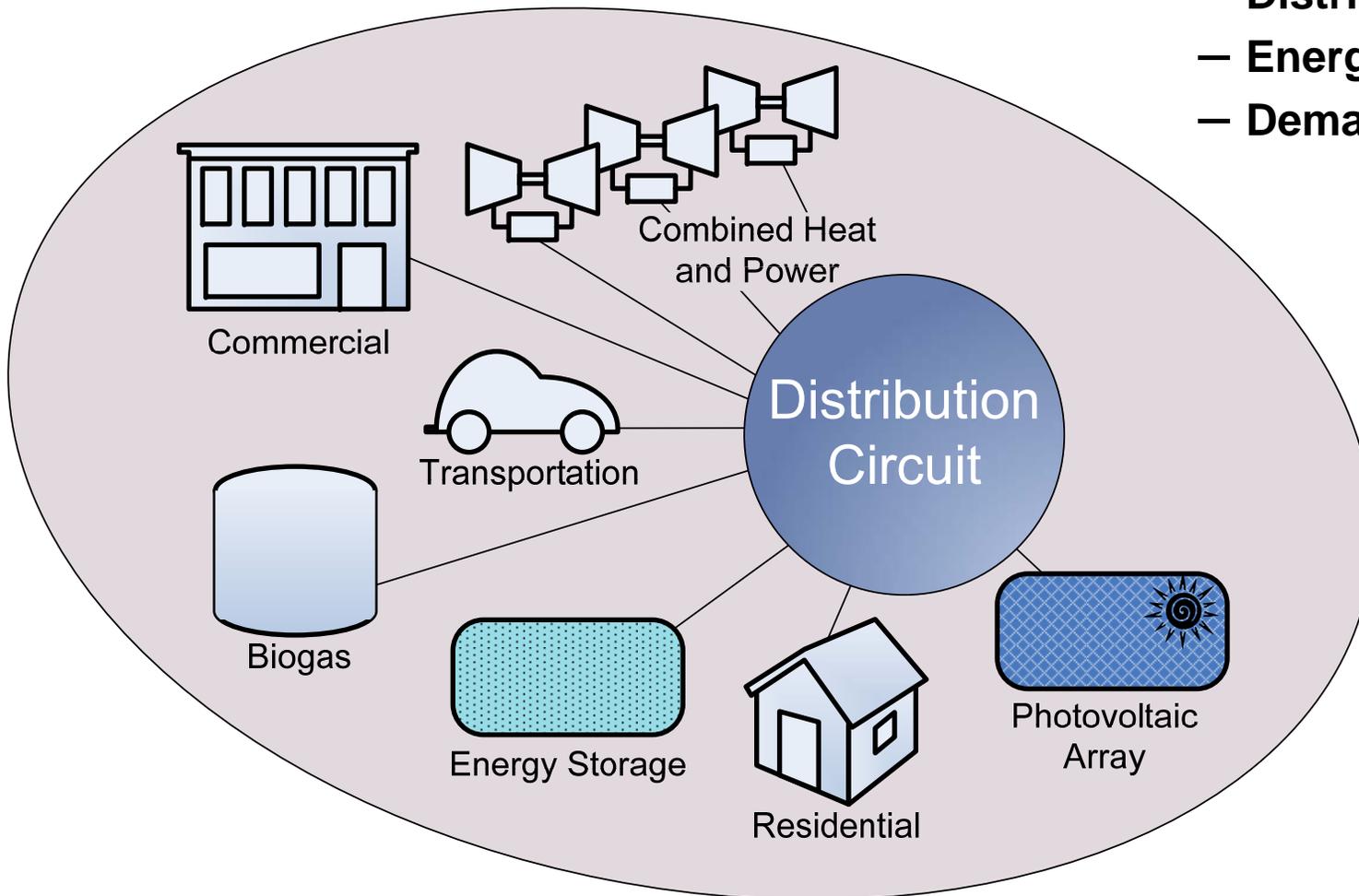
- Pictures of CPV Panels



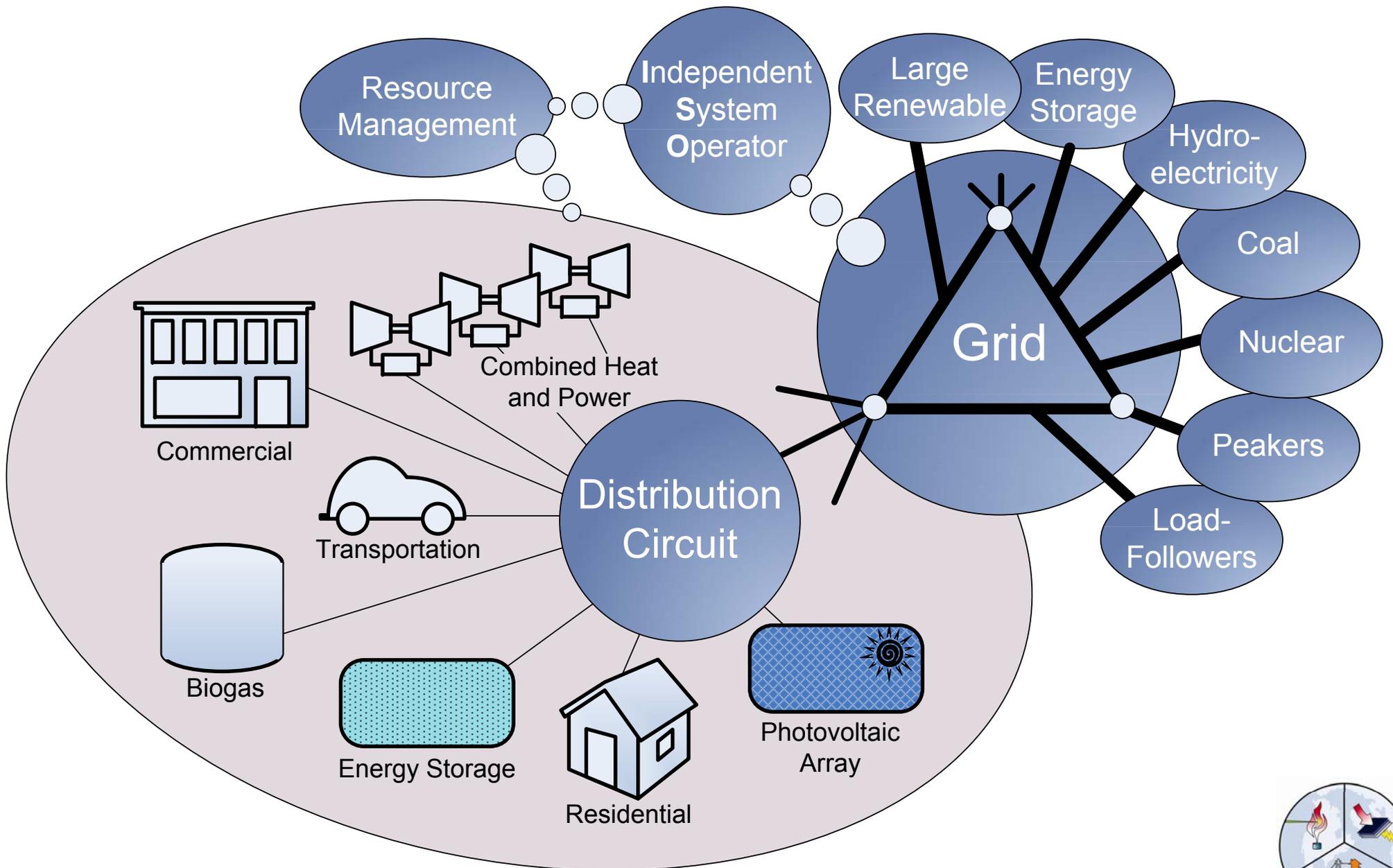
FINDINGS

Role of renewables within communities

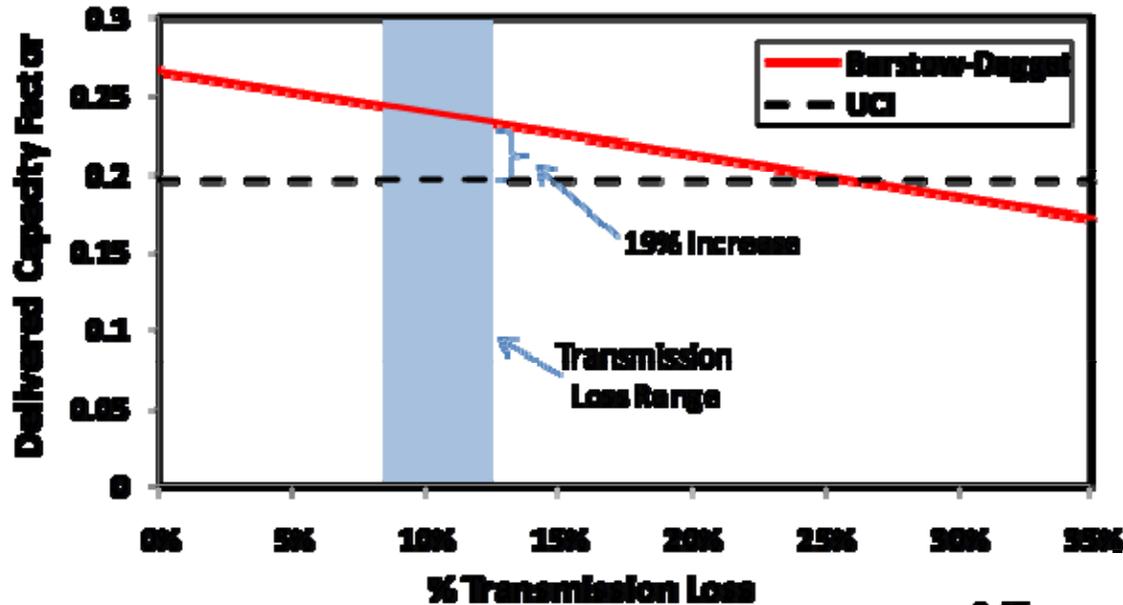
- **Community Resources**
 - **Distributed Generation**
 - **Energy Storage**
 - **Demand Response**



FINDINGS



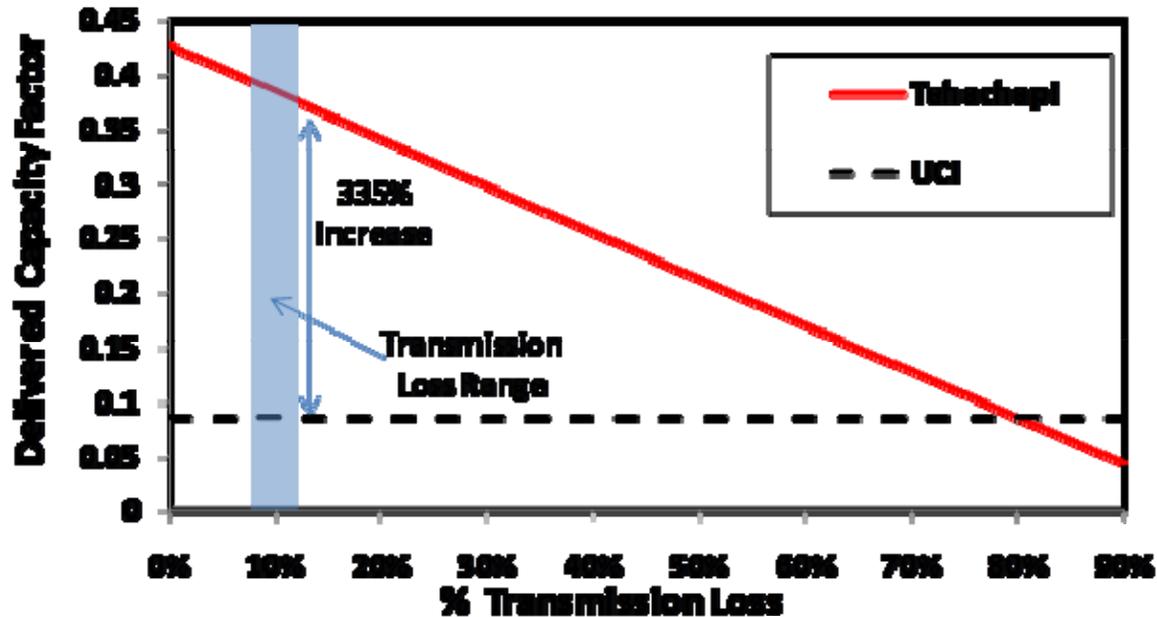
Regional vs Community Renewables



- Renewables prefer high resource locations
- Gain more than transmission loss

- Transmission constraints
- Community aesthetic and land availability

Limited community with primary regional



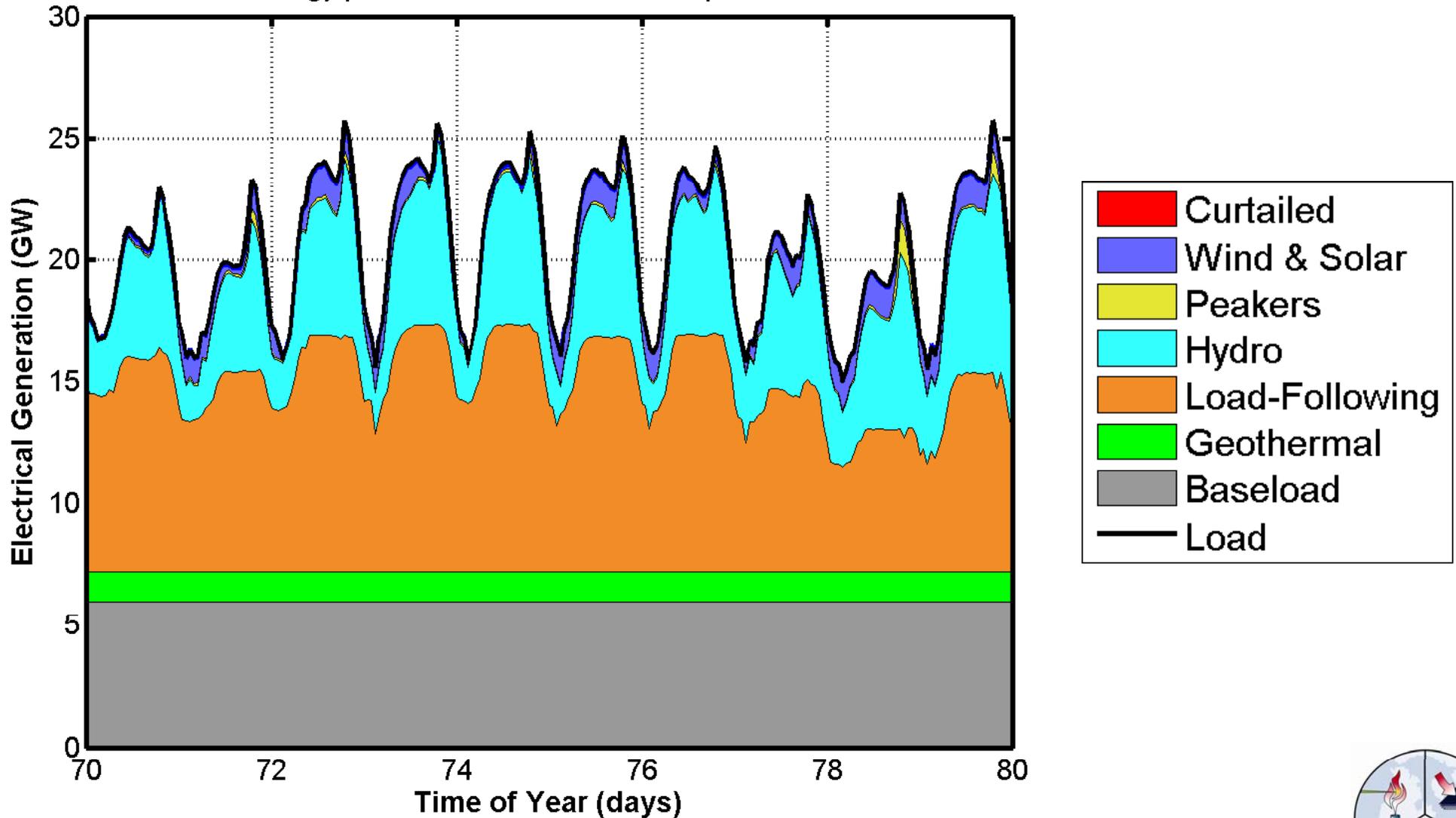
RESCO I – Approach



RESCO I – Approach

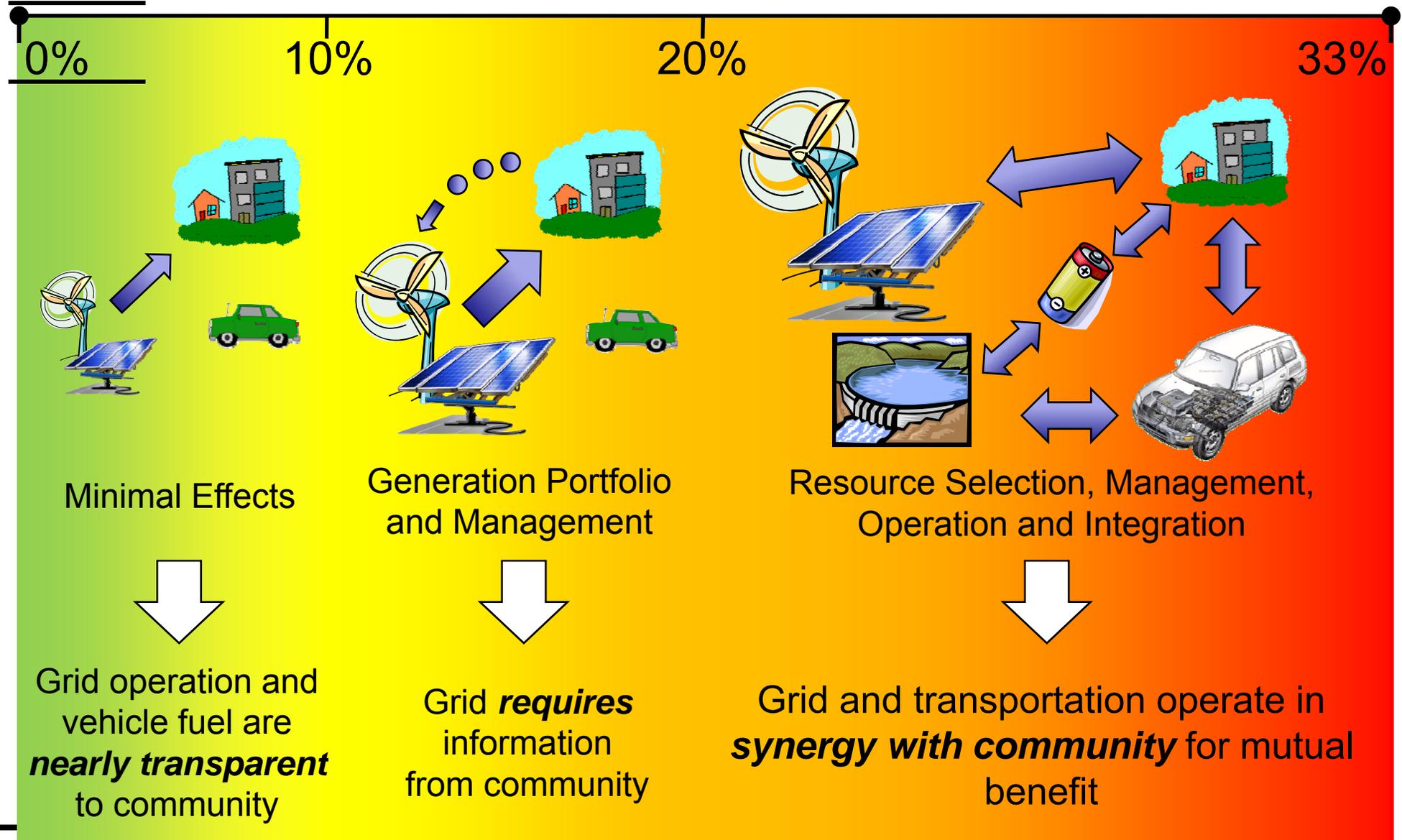
Ramifications of Renewable Energy

Energy portfolio for 11% renewable penetration

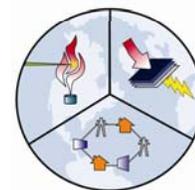
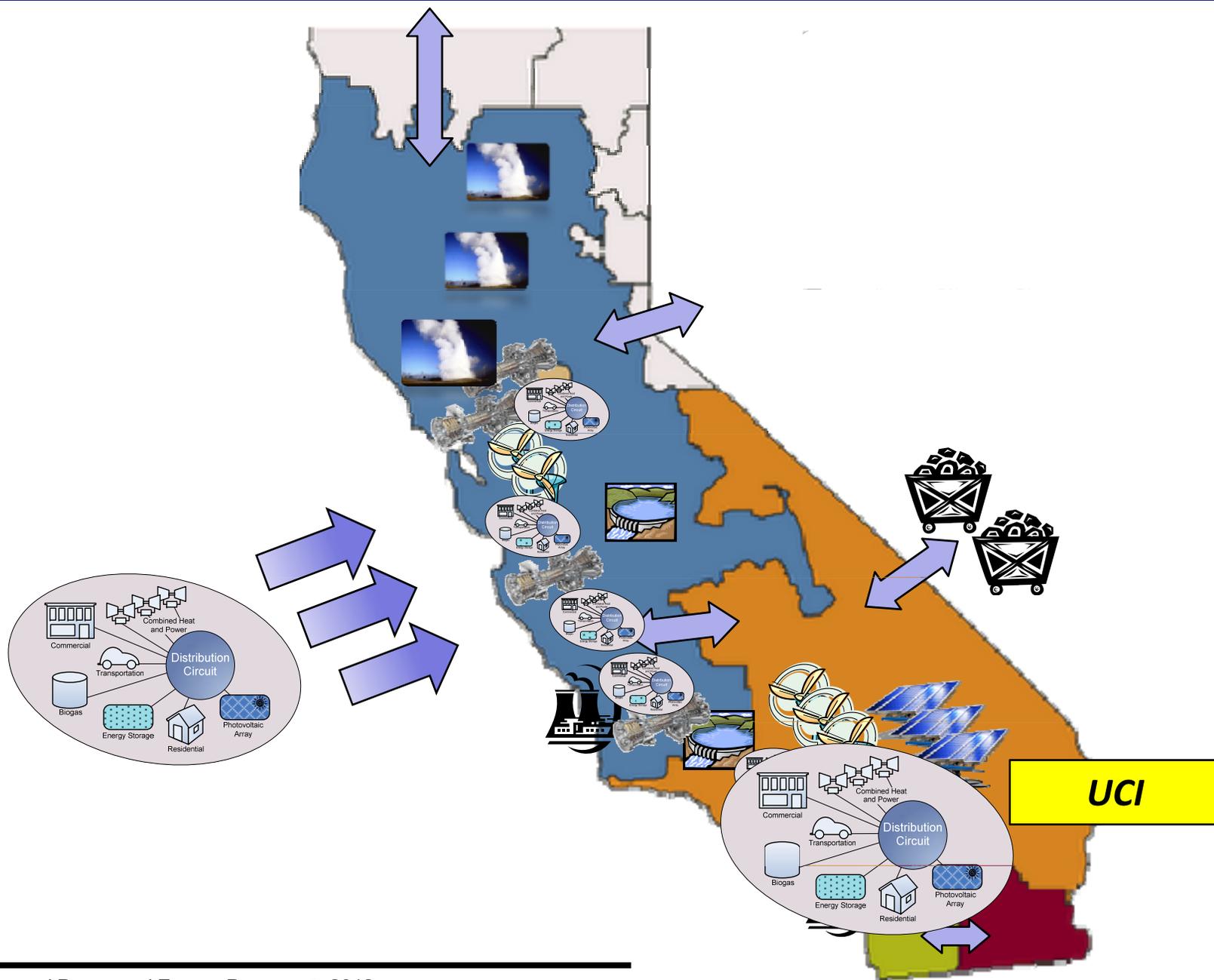


RESCO I – Approach

More Renewables, More Challenges

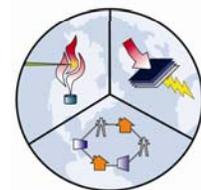


RESCO I – Approach



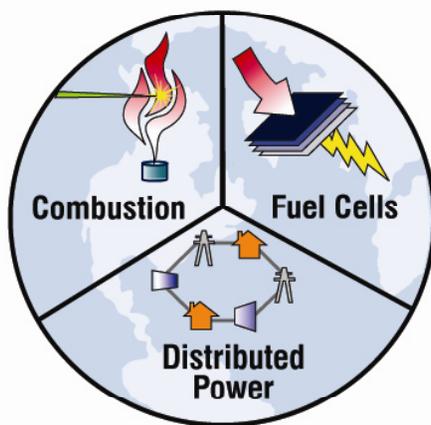
FINDINGS

1. **Community must help solve energy problem**
2. **Communities must communicate with other communities and energy infrastructure**
3. **Significant cost and energy savings available to efficient communities**
 - HVAC management
 - Novel controls
4. **Communities are needed to meet regional emissions and environmental goals**
5. **Renewable intermittencies may create community demand response value proposition**
6. **Integration of electricity and transportation is paramount at the community level**
 - EV Charging
 - NGV or H₂ vehicles
7. **Community alone cannot meet RPS goals**
 - Regional resources are required (more efficient solution)

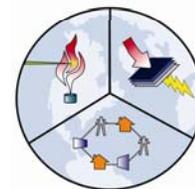


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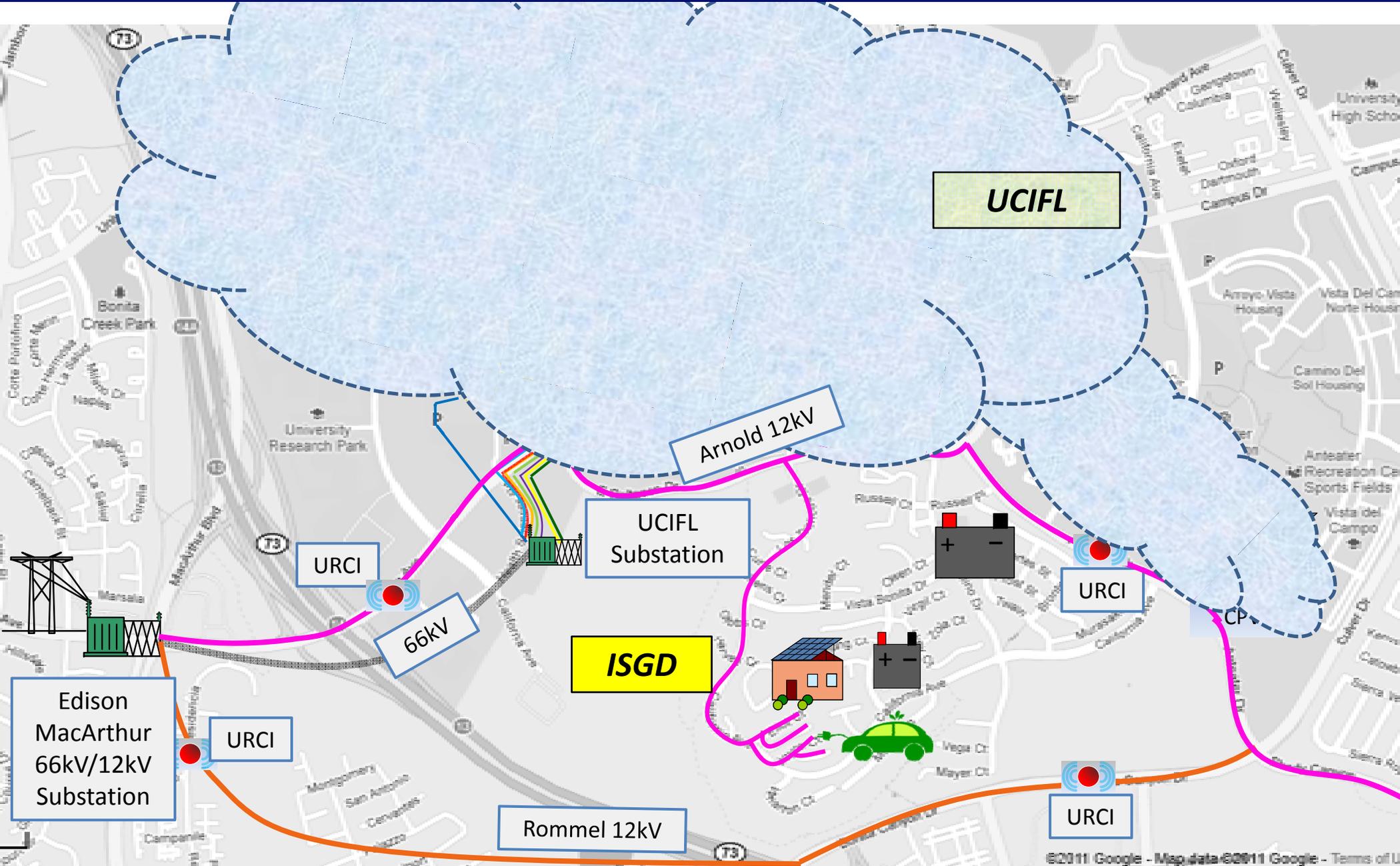
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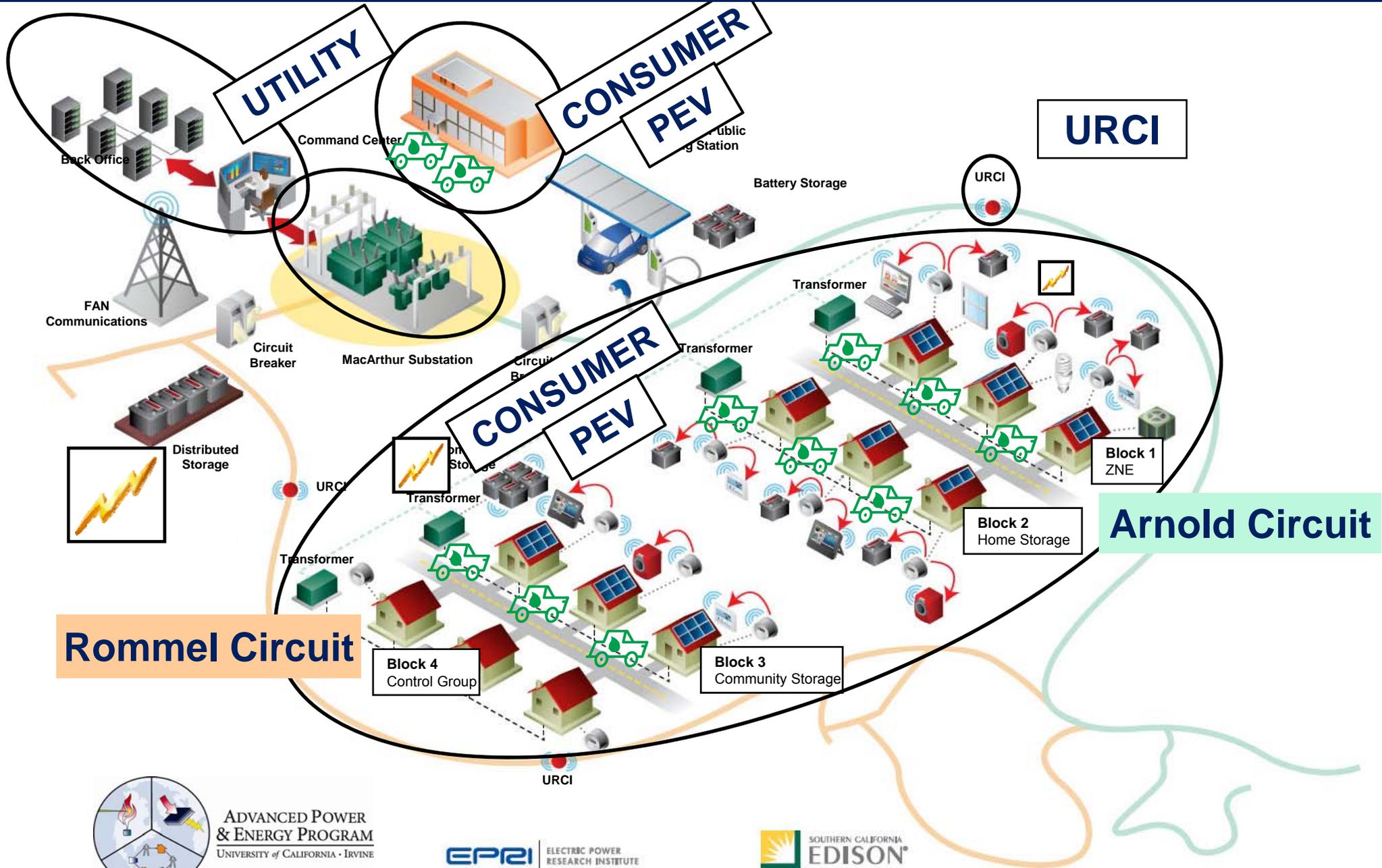
February 29, 2012



Irvine Smart Grid Demonstration Project



Irvine Smart Grid Demonstration Project



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Cost of Renewable Energy

- Cost Modeling

