

# Critical Roles for Fuel Cells in Sustainable & Renewable Power Generation

Integrated Energy Policy Report - Workshop



**National Fuel Cell  
Research Center**

UCIrvine | UNIVERSITY  
OF CALIFORNIA

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## Fuel Cell Features & Roles

Fuel cells are critical to sustainable/renewable energy:

- **Stationary fuel cells can operate on a variety of renewable fuels with the following features:**
  - Ultra-low criteria pollutant emissions
  - High fuel-to-electricity conversion efficiency
  - Distributed (at location of resource)
  - Poly-generation of power, heating, cooling, fuels
- **Fuel cells produce “dispatchable” clean power**
  - Can be designed to dynamically dispatch in a manner that complements intermittent renewables
  - Regardless of fuel type
- **Only distributed technology with competitive (NGCC) efficiency & required emissions**
- **Fuel cell vehicles offer zero emissions, rapid fueling, and long range (incl. renewable fuels)**
- **Reversible fuel cells ideal for massive energy storage**



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# Demonstrated Success

**Biogas Operation**



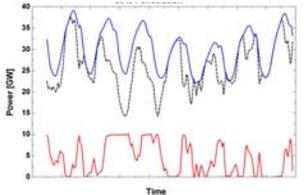
**BiogasTri-Gen: Power, Heat, H<sub>2</sub>**



**Combined Cooling/Power**



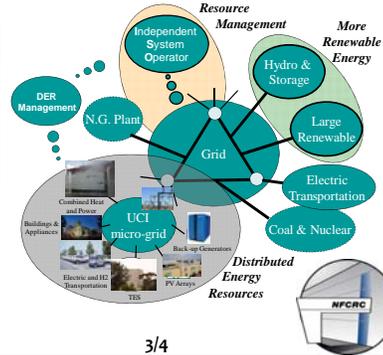
**Complement Intermittency**



**Dispatchable Green Power**



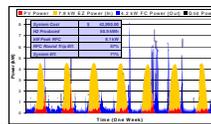
**RESCO Communities**



**Transportation**



**Energy Storage**



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# Thank You For Your Attention!



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