



Demand Response (DR) Enabling Technology Development (ETD) Project

February 28, 2003
Wurster Hall



PURPOSE OF MEETING

- ◆ **Introduce DR ETD research team to members of the Technical Advisory Committee (TAC)**
- ◆ **Review quickly the nature of the DR ETD project and its initial tasks**
- ◆ **Present the proposed R&D strategy by the UCB research team (Paul Wright)**



INTRODUCTIONS

◆ Research Team

- ▶ Ed Arens, Cliff Federspiel (Architecture, buildings)
- ▶ David Culler (Intel, TinyOS), Jan Rabaey (BWRC, Pico radio)
- ▶ Dick White (BSAC, sensors), Kris Pister (Smart dust)
- ▶ Paul Wright (Mechanical Engineering, energy scavenging)

◆ TAC members

- ▶ Joe Desmond (Infotility, real-time messaging)
- ▶ Joe Hughes (EPRI/E2I, industry standards)
- ▶ Roger Levy (consultant, business processes)
- ▶ Belvin Louie (PG&E, meters)
- ▶ Don Pezzolo (consultant, communications, thermostats)
- ▶ Mary Ann Piette (LBNL, buildings, energy monitoring)



PURPOSE OF PROJECT

- ◆ **Develop enabling technologies for a state-wide demand responsive electric power delivery system with “10/10” objectives**
 - ▶ 10 times the capabilities
 - ▶ 1/10th the cost
- ◆ **Leverage Department of Defense and other R&D spending at UCB and its partners (e.g., Intel)**



WHAT ARE DR ENABLING TECHNOLOGIES?

- ◆ **Wireless communications**
- ◆ **MEMS sensors**
- ◆ **Network management**
- ◆ **Systems integration**
- ◆ **Low-cost packaging**
- ◆ **Energy scavenging and storage**
- ◆ **Real-time operating systems**



WHY START AT UCB?

- ◆ **Leverage 3 specific UCB technologies**
 - ▶ Smart dust (integrate more for less)
 - ▶ Tiny OS (self-organizing networks)
 - ▶ Pico radio (low-power communications)
- ◆ **Encourage non-UCB collaborators**
 - ▶ DOE labs (LBNL, LLNL)
 - ▶ Work with private industry R&D groups



WHAT IS DR?

- ◆ **Demand response (DR) for this project is the ability of electricity users to respond “automatically” to time- and location-dependent price and contingency signals (that have varying amplitude and duration) to reduce/shift loads.**
- ◆ **DR is different from energy efficiency (EE), e.g., transient vs. permanent**

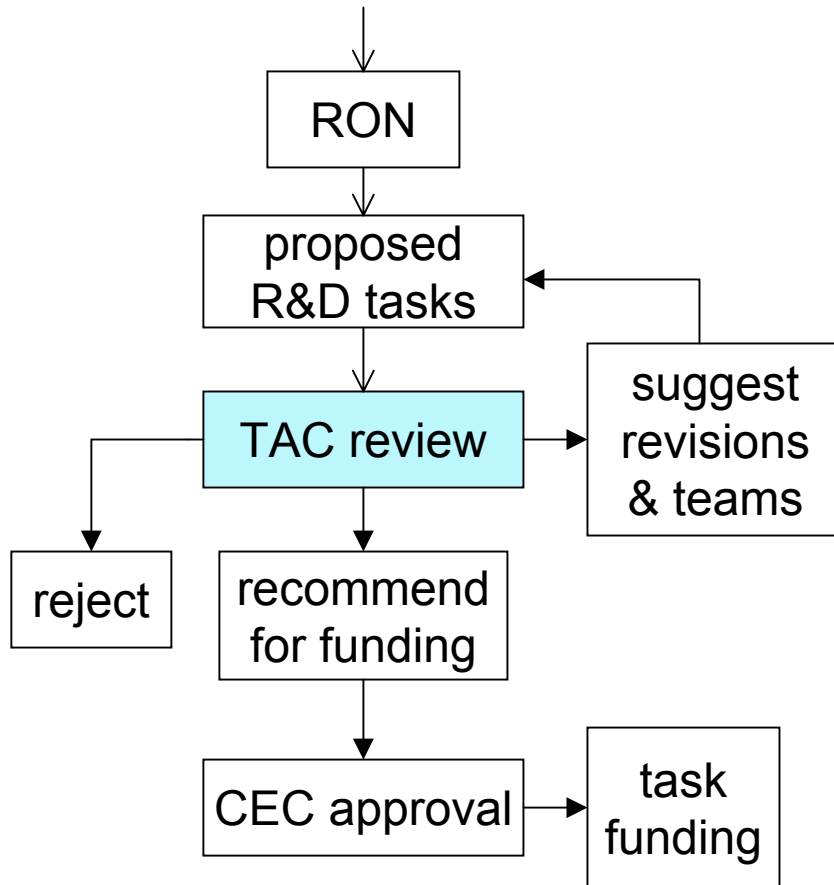


COMPANION DR PROJECT

- ◆ **Large Commercial and Institutional (LC&I) DR Demonstrations and Case Studies (Mary Ann Piette, LBNL)**
 - ▶ Stake in the ground study to establish state-of-the-art DR capabilities and R&D needs
 - ▶ Send a dynamic tariff to LC&I buildings
 - ▶ Determine automatic DR capability
 - ▶ Report results in a form that will help make policy and R&D decisions possible



TECHNICAL ADVISORY COMMITTEE (TAC) REVIEW



◆ DR ETD Project Manager & Admin

- ▶ Gaymond Yee
- ▶ Maureen Barnato

◆ DR Program Advisor

- ▶ Ron Hofmann

◆ CEC Contract Manager

- ▶ Laurie ten Hope



INITIAL PROJECT TASKS

- ◆ **Research Opportunity Notices (RONs)**
 - ▶ DR meter
 - ▶ DR thermostat & temperature nodes
- ◆ **RONs posted on CIEE web site**
 - ▶ <http://ciee.ucop.edu>
- ◆ **Proposal submitted by team of UCB researchers to be presented today**



FUTURE RONs

- ◆ **System Integration (4/03)**
- ◆ **Network Management (4/03)**
- ◆ **Technology Adoption (1/04)**



SEGWAY

- ◆ **Paul Wright**
- ◆ **Self Introductions**
- ◆ **Lunch**
- ◆ **Get to know each other**
- ◆ **Adjourn at 1 PM**