Industry Panel

RISES Workshop

3 February 2011

Moderator: David Waltz, CCLS, Columbia University

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Industry Panel

- **Artie Kressner, Con Edison, Director of R&D (retired)**
- **Eric Horvitz, Microsoft Research**
- **Eve Schooler, Intel Research**
- **Steven Phillips, AT&T Research**

- Many issues in industry/university collaborations
  - Intellectual property & research agreements,
  - Tech transfer
  - Spin-offs
  - Data sharing and test dataset construction,
  - Security
  - Publication of results

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Importance of Smart Grid to sustainability

- Natural center of energy future
  - Delivers power to everyone, everywhere
  - Can aggregate power from wind, solar, geothermal, co-gen, etc.
  - Can displace petroleum usage for transportation
  - Already lowest environmental impact energy producer (despite wide use of coal)
- But
  - Aging infrastructure, reactive maintenance only
  - ~Passive only (one-way flow, no switching)
  - Essentially no storage
  - Designed for peak use; at-risk then, underused most of the time
  - Few sensors

Smart Grid Needs

- Needs for computation
  - Modeling, system engineering & reengineering
    - Increase efficiency
    - Increase reliability
    - Increase flexibility
    - Integrate within wider natural world models
  - Sensor integration, communication, system state tracking & assessment
  - Control, especially predictive control
  - Predictive maintenance
  - Cybersecurity
  - Integration with the social world
    - Understanding & meeting customer needs
    - Motivating customers to adopt & use new, more efficient systems
  - Model business and regulation options
    - Explore regulation options
    - Explore infrastructure funding, building & maintenance options
    - Integrate ideas from markets, auctions, games, etc.

Sustainability-Related Projects at CCLS

- **Predictive maintenance of the NYC power grid (Con Edison, NYSTAR, one project with MIT)**
- **Optimal policies for testing, repair, engineering design (DOE, Con Edison, Princeton, 10 other companies)**
- **EV delivery vehicle charging facility (GE Ecomagination award, FedEx, Princeton)**
- **Climate modeling, using ensemble learning to optimally combine the 20 best climate models worldwide (With NASA)**