

Social/Economic Considerations

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Recap: Arne Remmen

Energy Efficiency—A short cut to an energy system based on 100% Renewables

- $EE + RE = SE$
- $EE = \text{the cheap solution}$ (so $RE = SE - EE = ?$)
- Case studies
 - TTS A/S: traffic lights based on LED
 - No cleaning needed but they don't melt snow!
 - Grundfos: pumps
 - Importance of labeling in advancing higher cost but higher efficiency pumps
 - Industry peer pressure/consumer awareness
 - Ford: dramatic improvements in fuel economy
 - Not really (but other improvements)
- European policies: high taxes, awareness, performance targets and standards (e.g. ErP)
- Benefits of SE
 - Profit—Enterprise and Society
 - Planet—Environment
 - People—Jobs, Health, Higher investment costs but lower running costs (lifecycle)

Recap: Dina Biscotti

Political and Market Mobilization for Renewable Energy and Energy Efficiency

- Groups as agents of change
- Attempt to focus more efforts on groups rather than individuals
- Interaction matrix: Price, Associative, Moral, and Communal Systems
- Case studies
 - opower: peer pressure based on utility bills
 - Interfaith Power and Light: video on energy and environmental actions, financing alternatives driven by higher moral purpose
 - Green Energy Agents: energy kits instead of candy bars
 - One Change: volunteer labor (Project PorchLight)
 - School programs
- Multiple reasons for why people do things
 - Role of trusted leaders
- Conclusions: People are socialized within institutions, can leverage social and group interactions to influence individual behavior (the quest for approval)
- Q/A: How to quantify effects?

Recap: Shi You

Virtual Power Plants: Enabling a 100% Renewable Energy System

- Challenges for RE development
 - Economic and Financial Barriers
 - Regulatory Barriers
 - Technical Barriers
 - Social Barriers
- Advantages of VPP
 - Visibility/transparency in TSO/DSO aggregated portfolio
 - Controllability
 - Market Access...
- Case Studies
 - Combined Power Plant (Germany)
 - Demonstrated feasibility of 100% RE system
 - FENIX VPP
 - Denmark: Market based approaches
 - EDISON EV project
 - Eco-Grid EU: real time market/TSO considerations for small scale systems
- Business model
 - Sustainable business needed to meet goal of sustainable market—can't live on incentives forever (need for incentives?)
- Q/A: time scale for communications/control

Group Discussion

Key Questions/Considerations

- More than just the cost driver
 - Differences in public mind set between Europe and U.S.—e.g. tolerance of energy taxation
 - Sociological studies needed
 - But existing body of information
- Economic benefits/drivers for VPP
- Time scale for VPP—studies
- Organizational/Institutional Problems
 - e.g. utility motivations (decoupling?)
- Personal attention to details of generation/use
- Socially engineered through the market
 - Packaging of information
- RE jobs/what kind?
- Design question: how you do it/what you do
- Trust, rationale, justification, hidden agenda, communication, collaboration
- Reactive vs. Proactive
- Role of Educational Institutions