Making DSM Real

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What is NAESCO?

- National trade association
- 130 members
- ESCOs, engineers, finance companies, suppliers and manufacturers
- International controls companies, major utilities and utility subsidiaries, independent national and regional companies
Donald Gilligan

- 25 years in energy efficiency
- Founded two ESCOs
- Consulting to trade associations, utilities, federal and state agencies
- Helped assemble largest commercial aggregation in New England
- Designed and implemented 75-point network to monitor ~500 MW

Making DSM Real

- Different approach
- Address underlying problem
- Solve technical problems
- Massive marketing effort
Different Approach

- Current focus on symptom
  - Real-time pricing issues
- Cold water bath for sick child
- Acme Automated Baby Dunker
- Crises indicate underlying problem
- Traders vs. operators
- Trader view not politically tenable

Underlying Problem

- Low system capacity factor
  - Lower peak; boost off-peak
- Telecom/airline examples
- Infrastructure in poor shape to try
  - VW example in residential
  - EMS example in commercial
  - M&T example in industrial
Customers Not Real Time

- Many will change load shapes
- Few will dance with the traders
- Response time is months to years
  - Retrofit project gestation ~ 12-18 months
- Problem of customer exhaustion
  - CA interruptibles near limit
  - Issue of thermal inertia

How Much DSM Is Available?

- NJ CRA Proceeding
  - See NJ BPU Docket Nos. EX99050347 et. al.
- Major electric utilities report available, cost-effective savings potential
  - 31% of industrial
  - 27% of commercial
  - 32% of residential
Public Policy Off Track

- Cut DSM funding in late 1990s
- Shifted from resource acquisition to market transformation
- No peak factor in building codes
- Regulatory hurdles for CHP
- Utilities dominate programs
- Misunderstanding of ESCOs

Funding/Mkt Transformation

- 2000 funding a fraction of 1993
- Obsession with what DSM "should cost"
- Continuous planning
  - CA: 3 programs in 3 years
- Cited as a cause of the CA electricity crisis by Chairmen Lynch and Kahn
- Change of policy in NYS?
Building Codes

- Performance standards based on annual energy use, not peak load

Hurdles for CHP

- Can raise new plant efficiencies to the range of 75 to 90%
- NIMBY issues
- Nearby Harvard/MATEP plant
  - 10 years in permitting
  - 3 years to turn on engines
Utilities Still Dominate

- Easiest alternative for regulators
- Conflict of interest exacerbated by stranded cost recovery
- Not sophisticated marketers
  - Little psychographic research on customers
  - Transforming markets or transforming customers?

Misunderstanding ESCOs

- Business profile similar to construction
  - Profitability: relatively low gross margins
  - Not in position to push innovations
- Little marketing expertise or budgets
- Little R&D expertise or budgets
What Can We Do?

- Solve technical problems
- Massive marketing/education programs
- Public funding

Technical Problems

- Heat storage
  - Off-peak DHW
  - Electric storage space heating
- Ice or cold water storage
- Building operator EMS training
- M&T approach to upgrading in industrials and institutions
Massive Marketing

- Assume goal is 25% shift
  - $50 Billion in electricity purchases
- Assume 4-year payback
  - $200 Billion in projects
- Assume 10-year program
  - $20 Billion/year
- Marketing at 5-10%
  - $1-2 Billion per year

Public Funding

- No alternative source of funds
- ESCOs can’t do it on cash flow
- ESCOs are small divisions of large companies -- less profitable
- No venture capital for ESCOs
- Only price elasticity tool available in short term to most customers?
Avoided Cost of Power

- Regulated world: avoided cost = \textit{cost} of last unit of generation
- Unregulated world: avoided cost = \textit{price} of last unit of generation \times \textit{all units floating at clearing price}
- Unregulated world: value of load reduction = 2.5 \times \textit{average price}, up to 11 times marginal price (W. Marcus, CA, 1998-99)

Conclusion

- DSM is available
- Focus on building system capacity factor, not real-time pricing
- Need massive effort on solvable technology/marketing problems
- Need public funding for effort