An Overview of Energy Efficiency Administrative Models and Portfolio Development

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Introduction

- Currently manage ICFI San Francisco office and west coast energy efficiency group
  - DSM program design, implementation and administration
  - Portfolio management
  - Energy efficiency potential studies
  - ICF EE clients have included We Energies, Wisconsin Public Service, ComEd, ERC, PG&E, Arizona Public Service, Entergy, TXU, CenterPoint, Northeast Utilities, Southern CA Edison, CA Energy Commission, Georgia Energy Office, DOE and EPA, Nevada Power, City of San Francisco, US EPA (ENERGY STAR)
- 11 years with IL DENR – Managed statewide IRP program
- Five years with US DOE – Managed national IRP program and Chicago Regional Office
- Founding board member of the Midwest Energy Efficiency Alliance

Overview

- Context and rationale for ratepayer-funded energy efficiency programs
- The evolution of administration
- Programs versus a portfolio
- Regulatory Framework

Strongest Consensus in 20 Years Supporting Energy Efficiency Investment

"Improving energy efficiency in our homes, businesses, schools, governments, and industries—which consume more than 70 percent of the natural gas and electricity used in the country—is one of the most constructive, cost-effective ways to address the challenges of high energy prices, energy security and independence, environmental concerns, and global warming." ***National Action Plan for Energy Efficiency***

- Recognize energy efficiency as a high-priority energy resource.
- Make a strong, long-term commitment to implement cost-effective energy efficiency as a resource.
- Broadly communicate the benefits of and opportunities for energy efficiency.
- Promote sufficient, timely, and stable program funding to deliver energy efficiency where cost-effective.
- Modify policies to align utility incentives with the delivery of cost-effective energy efficiency and
- Modify ratemaking practices to promote energy efficiency investments.

Twenty+ Years of Experience have Refined the Business and Policy Case

Demand-side management (DSM) can confer a variety of benefits on distribution systems and their customers:

- Portfolio management benefits
  - Relatively minor reductions on the super-peak can have significant impacts on spot prices
  - Improved load shape has value for customers even under an auction – higher load factor is cheaper to supply
  - Adding a DSM slice to the portfolio reduces total costs and shrinks absolute value of portfolio risk
  - Modularity of DSM resources and short time-to-market create option value
- Asset management
  - DSM can help defer and reduce some wires company investment
  - Most outages during recent CA heat storm due to overloaded transformers
- Consumers
  - Lowers bills directly for those who invest in efficiency
  - Can reduce costs to all consumers in the long run

And Strengthened the Policy Case

- Reduce the need for new capacity
  - Avoid emissions in many cases
  - Avoid land use impacts
  - Avoid the higher cost of capacity
- Increase the diversity and security of the energy system
- Capture economic benefits of spending on “local” resources

If it's Such a Great Deal.....

Won't consumers invest on their own? ***Yes and no***.

- Yes
  - Market share for energy efficient products is growing even where there are no incentives
  - Manufacturers and retailers are beginning to see the advantages of energy efficiency (ENERGY STAR label)
  - Consumers do respond to sharp price changes and certain calls-to-action
- No
  - Market share is growing much more slowly where there are no programs
  - Consumer and business decision-making is much more complex than our simple economic models suggest
    - High search and transaction costs
    - "Bounded rationality" – can only see part of the ledger
    - Energy savings are intangible – much more satisfaction from a granite counter top than a SEER 15 air conditioner
    - Low awareness and understanding
    - Better investment opportunities
  - Externalities
    - Consumers and businesses do not face a direct cost for the impacts of energy consumption
  - Can only issue a call-to-action so often – consumer overload

The Efficiency Gap

- The net result is a mismatch between what makes sense on paper and what most consumers and business actually do
- This creates a very large “efficiency gap” – The difference between Economic Potential and Naturally-Occurring energy efficiency
- Particularly a problem with demand response, as there is no level that is naturally occurring.

How Big is the Efficiency Gap?

- Table shows efficiency potential as a % of sales based on a review of 19 studies – typically 10-year horizon
- Low-end "Achievable" numbers represent what could be saved over-and-above "Naturally Occurring" levels
- Naturally-Occurring is on the order of 5% over this horizon

	Technical Potential	Economic Potential	Maximum Achievable Potential	Achievable Potential
Residential Sector	21% - 36%	18% - 26%	11% - 35%	2% - 7.9%
Commercial Sector	18% - 41%	13% - 35%	6.3% - 36%	3.6% - 9%
Industrial Sector	17% - 38%	10.6% - 32%	6.3% - 60%	2.3% - 19%

What Does this Gap Cost Us?

- In a recent study for the State of Georgia, we found that capturing Achievable Potential that was about at the mid-range of these estimates would:
  - Yield a total net benefit of $1.6 billion ($4.4 gross benefit with $2.8B in resource costs)
  - Defer the need for 1,400 MW of new capacity
  - Reduce CO2 emissions by 1.5% (more than double the impact throughout the region)
  - Reduce wholesale prices on average by close to 4% by 2015
- National Action Plan for Energy Efficiency
  - Extrapolate the results from existing programs to the rest of the country:
    - $20B in bill savings; $250B net societal benefits; 200M tons less CO2
- Leaving it all to the market right now, leaves a lot on the table

What Can Fill this Gap

Portfolios of demand-side resources including:

- Energy efficiency based on market opportunity and market leverage
  - Incentive-based
  - Market conditioning (information, training, technical assistance)
  - Policy-based
    - Direct intervention policies
      - » Building codes
      - » Appliance standards
    - Enabling policies
      - » Emissions credit set-asides
- Demand response
  - Reliability-based, e.g. interruptible rates
  - Economic – demand bidding, dynamic pricing

The Evolution of Administration

- Historically, utilities were the administrative channel of choice:
  - They built the power plants that EE was supposed to avoid
  - They had the most immediate access to customers
  - It was convenient
  - Not every utility was equally enthused, nor was every commission
    - Perception that lack of enthusiasm meant hostility
- Restructuring created a need and opportunity to rethink administration
  - Utilities were supposed to focus on competing – not a good fit with EE
  - EE was transformed into a social good to be managed by organizations with a social good mission
  - Wires company no longer had skin in the game
  - Opportunity for those who never wanted utilities to do this to shift responsibility

The Rise of the New Model

- Two new types of administrative entities
  - State agencies – NYSERDA, WI Dept of Administration
  - Third parties – Vermont's "Efficiency Utility", Energy Trust of Oregon, Northwest Alliance, New England Energy Efficiency Partnership
- Key characteristics of the models
  - No mission conflict; lost revenue is not an issue
  - State agency models had to deal with often antiquated procurement rules
  - State agencies had to work within highly charged state budgeting processes
  - Pure third party models required creation of heretofore nonexistent organizational structures
  - Accountability via contract or political process

Reality Sets in....

- Almost every state-administered system has come under budget attack and several have lost $millions
  - Some issues with accountability and expertise
- Third party structures have:
  - Faced significant start-up costs
  - Had some issues with accountability
  - Had to create market channels/establish brands separate from utilities
- These new models also made a major contribution
- No longer viewed as a panacea, but as one of a number of options
  - The right model is the one that fits the jurisdictional context best

What Fits the Jurisdictional Context Best?

- What are you trying to achieve? Two conventional justifications
  - Resource acquisition
    - To defer asset acquisition
    - To balance a portfolio
    - To reduce costs
    - To mitigate environmental impacts
  - Market transformation
    - To effect a lasting change in market behavior such that energy efficient choices are preferred even without incentives
- The broad rationale for DSM remains unchanged regardless of industry structure
- Wires company role can satisfy a number of conditions required to establish and effective DSM structure
  - Immediate interest in wires asset management
  - Mature back-office
  - Existing brand that creates important leverage with customers
  - Legacy technical services capability
  - Provides most effective nexus of accountability
- The plenary issue is whether it makes sense broadly from a resource efficiency perspective to invest in energy efficiency. If yes, what is the most effective and efficient way to get it done?

What Fits the Jurisdictional Context Best?

- Where do the core competencies lie?
  - Market analysis
  - Customer recruitment and care
  - Technical services
  - Marketing
  - Back office
  - Education and training
  - Policy
- How is accountability best assured?
- What can be fastest to market?
- Are there persistent/inherent barriers to action?
- How can funding stability be best assured?

What to Look for in an Administrative Model

- An administrative model should efficiently support four basic functions
  - Planning and budgeting
  - Implementation
  - Management
  - Evaluation
  - Can take 12+ months to put all of this in-place from a cold start
- In addition, the model must be structured to ensure accountability for performance across three dimensions :
- Production; the delivery of saved kWh and kW
  - Financial; efficient production and the use of accepted, standard budgeting and accounting practices – the books must be auditable
  - Quality; services must meet professional standards and customers must be satisfied (and ideally delighted)

Best Practice Planning and Budgeting

- Understand the nature of the load you are trying to influence
- Understand the nature of portfolio construction and management
  - Portfolio is not just a collection of programs, it is a set of programs designed to work together to maximize an objective
  - Needs to be designed to match load and resource characteristics
  - Need to integrate conceptually, energy efficiency, demand response and distributed energy resources
- Understand the nature of risk and risk management
  - DSM programs can be valuable as mitigation and hedging strategies
  - DSM programs come with their own set of risks that must be managed
    - ICF prepared analysis of realization rates for 85 EE programs (realization rate is the ratio of actual kWh saved to anticipated savings)
    - The standard deviation for this set of programs was 41% - gives us 95% confidence that a program will deliver between 0 & 223% of its stated goal – that is risk
- Understand local markets
- Understand customers
- Understand where the points of greatest leverage are
- Understand cost – particularly the cost to manage a portfolio – often underestimated.

Best Practice Implementation

- Vest actual implementation activities in entities which have those activities as a core competency
- Different markets/measures require different market channels and different implementation strategies
- Take care to not create a “drive-by” program; long-term success depends on delivery credibility
- Flexible procurement process
  - Fast – should be able to write and issue an RFP, select a winner and execute a contract in 3-4 months
  - Documented
  - Flexible
- Flexible contracting
  - Include performance provisions that create a balance between risk and reward, but one size doesn’t fit all programs given different risks
  - Take-it-or-leave-it contracts will drive away quality firms

The Forgotten Best Practice: Program Management

- DSM program administration includes a well understood set of functions
- These functions are suited to treatment as business processes with well defined inputs/outputs and costs
- Rarely are such standard practices applied – management often is something that is figured out along the way
- Leads to inefficiencies, higher costs, and missed opportunities
- If DSM is to be treated as valuable resource, then we should treat the business processes that manage this resource as rigorously as we would management of any other valuable asset.

Best Practice Management –

- Begins with accountability
- Followed by very clear performance metrics with periodic benchmarking
  - $/kWh delivered
  - $/customer acquired
  - Cycle time (project recruited to project completed)
  - Harvest rate (projects completed**/** initial projects recruited)
  - kWh per employee
- Attached to specific business processes
- Supported by a tracking system – this is not a spreadsheet
- That enables real-time rolling internal and external evaluation of performance vs. metrics
- That, in turn, flows back into continuous improvement DSM portfolio planning <u>and</u> resource planning/ asset management
- And affects management incentives/disincentives

Best Practice Evaluation

- Evaluation has two purposes
  - Determine if metrics are being met
  - Identify opportunities for improvement
- Mistake to set this up as an adversarial process
- Evaluation is not a post-program implementation activity
  - Evaluators should be brought on board at the beginning
    - Help avoid design errors
    - Help ensure effective tracking system
  - Need to have rolling evaluation
- Given the importance of interactive evaluation, evaluation costs will be higher (5 - 7% as opposed to 3%)

The Most Effective Model is not Necessarily a Single Model

- Some of the most effective programs involve policy changes
  - Ideally building codes and appliance standards provide the foundation for incentive-based programs
- Market conditioning activities are vital
  - Training
  - Awareness building
  - Education
  - Technical assistance
- Most effective portfolio integrates policy-driven initiatives, direct interventions and actions that create the platform for new business models to emerge.
  - California has done a lot wrong, but it has made a huge and interesting commitment to accomplish this integration
  - Widespread adoption of smart meters and dynamic pricing will change the way we think about efficiency

The Regulatory Bargain

- Utilities, when not directly penalized for being successful, have been leaders in DSM
  - PG&E, NU, Xcel, We Energies, PacifiCorp, MidAmerican
- Cost recovery should not be an issue – if you are going to employ DSM someone has to pay for it
- “Decisional” prudence should be addressed upfront
- “Managerial” prudence should be tied to evaluation
- Neither of these two tools of accountability exist within a contractual structure
- Decoupling becomes more important as programs become more aggressive
- Incentives do work; When a cost center becomes a profit center, culture changes.
  - This does not mean that programs cost more – incentives can be tied to both production and financial performance.

Summary of Cost Recovery and Incentive Policies

- Three broad elements:
  - Basic cost recovery
    - Public benefits charges: ranging from 0.33 to 3 mills per kWh for electric energy efficiency
    - Rate case
    - Tariff rider
    - Deferred account
  - Lost margin recovery/avoidance
    - Decoupling as a mechanism for avoiding lost margins
      - Currently in California, Maine, Maryland, New York, Oregon, and Washington
      - Proposed in New Jersey (gas), Vermont (electric) and Connecticut (electric)
  - Performance incentives for administrators
    - CT - Performance management fees for reaching 70 to 130% of goals
    - MA - Incentives for reaching 75 to 110% of goals; Utilities earn 5% on energy efficiency spending
    - MN - Incentives for reaching 90 to 150% of goals; Incentive paid is 30% of energy efficiency costs
    - NV – 5% ROE adder

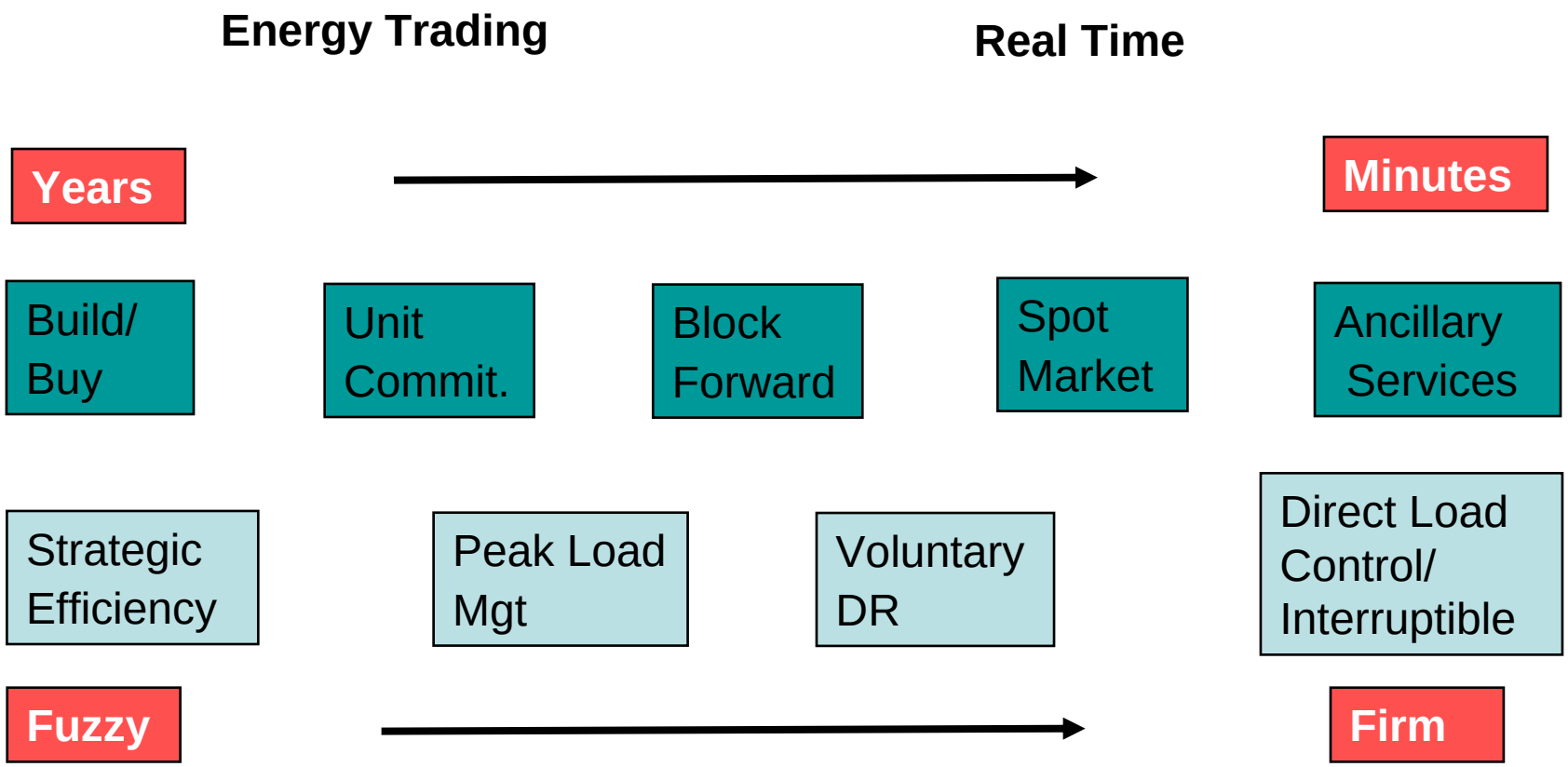
Programs versus Portfolios

- It is the portfolio and not any individual program that matters – deliver your objectives at the lowest risk-adjusted cost
- Risk is important – all programs and all resources carry risk, both unique and systematic
  - Fundamental element of portfolio design is to avoid resources with positively-correlated risks
    - Diversify across technology
    - Diversify across delivery channel
    - Diversify across sector
    - Diversify across load shape
- Best practice is evolving toward a more integrated view of the portfolio (EE + DR + DG)
- Portfolios inevitably evolve – markets change and mature, consumers grow more sophisticated and new technologies emerge

The Elements Of A Best Practice Portfolio Policy

- Diversity – Mix of programs/resources with offsetting risks
- Flexibility - The basic stability of a portfolio is enhanced by designing it to adapt to change and learning.
- Fewer programs with greater reach should be preferred.
- Program designs should be kept simple. Complexity inevitably increases both management and implementation costs.
- Direct the program intervention to points of greatest leverage – often trade allies and upstream market actors.
- When beginning from a cold start, a phased approach to deployment of multiple programs works best.

Another Way to Look at the Options



Demand Response: Design Principals for Creating Customer and Market Value, Peak Load Management Alliance, November 2002