A decorative diagonal strip on the left side of the slide contains a series of nature-themed images: a landscape with trees, orange flowers, a water droplet hitting a surface, a green leaf with a central vein, a mountain range with a lake, a green field with a tree, another water droplet, another green leaf, another orange flower, another mountain range, and another green field.

Integrated Demand-Side Management: Opportunities and Challenges

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Overview

What is integrated demand-side (IDSM) management and what opportunities does it create for utilities and their customers?

Integrated Demand-Side Management (IDSM)

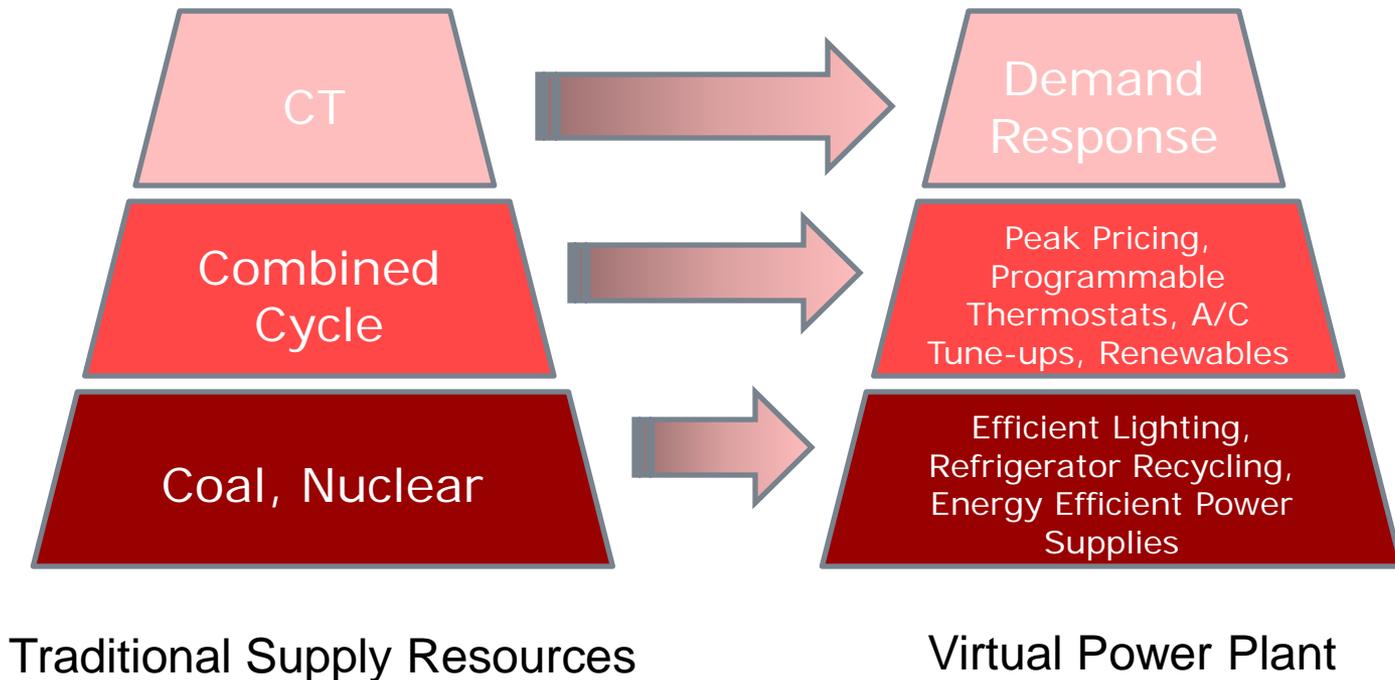
- Integrated DSM (IDSM) is the idea of creating a portfolio of EE, DG, DR, FC, rate structures, smart grid and education
 - Relatively new term
 - Could reduce costs, increase impacts (“depth” of savings), increase customer benefits and satisfaction levels
 - Overall result, may be more cost-effective DSM, lower energy costs for ratepayers, and increased reliability
- IDSM simply means integrating DSM services at various levels:
 - Planning and program design
 - Marketing
 - Implementation
 - Evaluation

Integrated Demand-Side Management (IDSM)

- What are the DSM products that lend themselves integration?
 - Primarily energy efficiency and demand response, but also
 - Distributed generation
 - Renewable resources, and
 - Fuel conversion
- How about electricity and gas?
 - Combination utilities
- How about electricity and water?
 - Municipal utilities

Integrated DSM and Integrated Resource Planning

The “virtual power plant”



Why Integrate?

- Integration is a sensible approach from all perspectives:
 - The utility:
 - Improves coordination – planning and program design
 - Saves money – economies in planning, marketing and delivery
 - Integrated audits and opportunity assessment
 - Streamlines regulatory and stakeholder interactions
 - Increases the “depth” of savings
 - The customer:
 - Less hassle
 - Larger savings
 - More incentives (possibly)
 - Society:
 - Greater benefits
 - More cost-effective
 - Possibly smaller rate impacts
 - Regulators:
 - Ease of oversight

The Impetus for Integration

- Energy efficiency portfolio (performance) standards:
 - EEPS is a policy instrument similar to, and may be linked to, a renewable portfolio standard (RPS)
 - Requires utilities to supply a set portion of their electricity from renewable resources
 - Compliance with EEPS in most cases requires a new, “integrated” approach to DSM planning
- Renewable resource integration
- National energy policy

IDSMS – Challenges and obstacles – planning barriers

- The pesky question of reliability:
 - Are all DSM resources equal - can EE be viewed as the equivalent of base load plants.
 - Can pricing be a viable substitute for intermediate supply options
 - Is dispatchable DR an equivalent for peaker resources
- Analytic methods to support integration:
 - IDSMS cost-effectiveness methods
 - Valuation of capacity – particularly in restructured markets
 - Free-ridership assessment
 - Roadmap for integration of emerging technologies

IDSMS – Challenges and obstacles – institutional barriers

- Some stakeholders and regulators may not be fully receptive to IDSMS:
 - Lack of familiarity with DR in some cases, while EE is well established
 - Customers' perceptions of value - and costs - of DR and other resources such as fuel conversion
 - Traditional focus among many stakeholders on reductions in energy use through conservation
 - The lingering negative memories of restructuring
- Organizational issues within utilities – must cross silos
- Lack of expertise among stakeholders - utilities and regulators
- Large scale, complexity and costs of AMI relative to DR benefits
- DR programs more directly impact customers
- A focus on short-term benefits and costs rather than on the long term, i.e. increasing customers' ability to respond to loads and prices

IDSMS – Challenges and obstacles – infrastructure

- Demand-side service providers tend to be specialized, focusing on specific resources or even measures
- Aggregators with narrowly tailored DR solutions may be at a disadvantage compared to a demand-side “solution” provider, i.e., one that offers integration across DSM resources
- Need to change focus of outsourcing from the near-term to longer term engagements for demand response
- Instead of simple energy audits, there will be the need for more complex technical studies
- What will be the standards for reliability and risk sharing

IDSMS – Challenges and obstacles – analytic barriers

- Allocation of costs and benefits to different initiatives – EE, DR, DG, or rates
- Appropriate framework for analyzing cost-effectiveness of IDSMS activities:
 - Should resources be analyzed at the individual program or portfolio level
 - Is net-to-gross still an issue and does it change for IDSMS activities – DR is often assumed not to have free-riders in the same context as EE
- How to determine the baseline for measuring DR impacts
- How to account for interactions among different resources – e.g. impact of EE measures on DR savings

Reconciling IDSM, EEPS and IRP

- Incorporating DSM portfolios into the IRP process, modeling options:
 - Optimization models – fully integrated, optimal amounts of DSM are selected by the model (full integration)
 - System expansion models – amounts of DSM are determined exogenous to the model (partial integration)
 - Decrementing – load forecasts are adjusted by predetermined amounts of DSM
- Treatment of DSM will be different depending on the modeling approach
- Bundling of DSM resources makes such as EE and DR pose serious analytic challenges
- Under most EERS structures decrementing may be the only modeling option

Glimmers of Hope

- Utilities – and regulators - in many jurisdictions are seeking demand-side solutions, not necessarily a:
 - EE solution, and a DR solution, and a pricing solution, and a smart grid
 - They are looking for integrated demand-side solutions that leverage synergies across these activities
- Recognition of IDSM benefits by CPUC
- New, more integrated approaches to EEPS in states such as Pennsylvania
- PG&E DSM organization – now IDSM