What Remains to be Done with Demand Response? A National Forum from the FERC National Action Plan on Demand Response Tries to Give an Answer

Cost-Effectiveness Working Group

Tim Woolf, Vice President
Synapse Energy Economics

Lisa Schwartz, Senior Associate
Regulatory Assistance Project

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Outline

- Members of the Working Group.
- Scope of the report.
- Recent experience with demand response cost-effectiveness frameworks.
- Proposed demand response cost-effectiveness framework.
- Demand response program costs.
- Demand response program benefits.
- Issues for further research.

Members of the Working Group

First Name	Last Name	Organization Name	Organization Type	E-mail
Alberto	Martinez	Energy Curtailment Specialists	Service Provider	albertom@ecsgrid.com
Andy	Satchwell	Lawrence Berkeley National Laboratory	Researcher	asatchwell@lbl.gov
April	Paronish	Indiana Office of Utility Consumer Counsel	Grid Operator	AParonish@oucc.IN.gov
Brad	Davids	EnerNOC	Service Provider	bdavids@enernoc.com
Carl	Silsbee	Southern California Edison	Utility	Carl.Silsbee@sce.com
Crissy	Godfrey	Maryland Public Service Commission	Regulator	cgodfrey@psc.state.md.us
Dan	Hurley	Maryland Public Service Commission	Regulator	dhurley@psc.state.md.us
Erin	Malone	Synapse Energy Economics	Consultant	emalone@synapse-energy.com
Jim	Gallagher	New York Independent System Operator	Grid Operator	jgallagher@nyiso.com
Josh	Bode	Freeman, Sullivan & Co.	Consultant	joshbode@fscgroup.com
Joy	Morgenstern	California Public Utility Commission	Regulator	joy.morgenstern@cpuc.ca.gov
Ken	Corum	Northwest Power and Conservation Council	Advocate	kcorum@nwcouncil.org
Kevin	Mosier	Maryland Public Service Commission	Regulator	kmosier@psc.state.md.us
Lisa	Schwartz	Regulatory Assistance Project	Consultant	lschwartz@raponline.org
Mark	Martinez	Southern California Edison	Utility	mark.s.martinez@sce.com
Pete	Pengilly	Idaho Power	Utility	PPengilly@idahopower.com
Phil	Hanser	Brattle Group	Consultant	phanser@brattle.com
Ralph	De Geeter	Maryland Public Service Commission	Regulator	rdegeeter@psc.state.md.us
Scott	Baker	PJM Interconnection	Grid Operator	bakers1@pjm.com
Tim	Woolf	Synapse Energy Economics	Consultant	twoolf@synapse-energy.com

Types of Demand Response Resources

Price-Based Options	Incentive-Based Options	Wholesale Market Options
TOU Rates	Direct Load Control	Emergency Demand Response
Real Time Pricing	Demand Bidding/Buyback	Capacity Market Programs
Critical Peak Pricing	Critical Peak Pricing	Energy Market Programs
Peak Time Rebates	Peak Time Rebates	Ancillary Services Market Programs
	Interruptible/Curtailment	

Scope of the Report

- Retail. The report will focus on demand response programs offered by utilities and funded by retail electric customers.
  - Utilities is used broadly to include investor-owned utilities, public power agencies, municipal utilities and cooperatives.
  - These are the programs that regulators and public utility boards need to review for cost-effectiveness, and that are of interest to consumer advocates and other public policy stakeholders.
- Wholesale. The report will not focus on demand response programs offered by organized wholesale electricity markets.
  - The criteria for deciding whether to implement a wholesale demand response program is different from the criteria for deciding whether to implement a ratepayer-funded retail demand response program.

Recent Experience with Demand Response Cost-Effectiveness Frameworks

- California Public Utility Commission.
- Pacific Northwest Demand Response Project.
- Ontario Power Authority.
- Mid-Atlantic Distributed Resources Initiative.
- Other state activities.
- Literature:
  - Lots of literature on the benefits of demand response programs.
  - Less literature on the costs of demand response programs.
  - Much less literature on the framework to use in assessing the cost-effectiveness of demand response programs.

Overall Cost-Effectiveness Framework

- Five cost-effectiveness tests are used widely throughout North America for measuring the cost-effectiveness of energy efficiency programs.
- Some of the costs and benefits are different for demand response programs, but the framework is the same.

	Participant	RIM	PAC	TRC	Societal
Demand-Side Program Costs:					
Program Administrator Costs	---	Yes	Yes	Yes	Yes
Measure Cost: Rebate to Participant	---	Yes	Yes	Yes	Yes
Measure Cost: Participant Contribution	Yes	---	---	Yes	Yes
Non-Energy Costs	participant	---	utility	participant	societal
Lost Revenues to the Utility	---	Yes	---	---	---
Demand-Side Program Benefits:					
Customer Bill Savings	Yes	---	---	---	---
Avoided Energy Costs	---	Yes	Yes	Yes	Yes
Avoided Capacity Costs	---	Yes	Yes	Yes	Yes
Avoided Transmission and Distribution Costs	---	Yes	Yes	Yes	Yes
Non-Energy Benefits	participant	---	utility	participant	societal

Implications of the Cost-Effectiveness Tests

Test	Key Question Answered	Scope of the Test	Implications
Societal Cost	Will total costs to society decrease?	Includes the costs and benefits experienced by all members of society.	Most comprehensive comparison.
Total Resource Cost	Will the sum of utility costs and program participants' costs decrease?	Includes the costs and benefits experienced by all utility customers, including program participants and non-participants	Includes important public policy impacts, e.g., non-energy benefits for low-income customers, and other energy savings.
Program Administrator Cost	Will utility costs decrease?	Includes the costs and benefits that are experienced by the energy efficiency program administrator.	Limited to impacts on utility revenue requirements. Most consistent with supply-side cost-effectiveness methodologies.
Participant Cost	Will program participants' costs decrease?	Includes the costs and benefits that are experienced by the demand-side program participants.	Provides distributional information. Useful in program design to improve participation. Of limited use for cost-effectiveness screening.
Rate Impact Measure	Will utility rates decrease?	Includes the costs and benefits that will affect utility rates, including program administrator costs and benefits and lost revenues.	Provides distributional information. Useful in program design to find opportunities for broadening programs. Should not be used for cost-effectiveness screening.

Demand Response Program Costs

Cost	Participant	RIM	PAC	TRC	Societal
Program Administrator Expenses	--	Yes	Yes	Yes	Yes
Program Administrator Capital Costs	--	Yes	Yes	Yes	Yes
Increased Energy Costs	--	Yes	Yes	Yes	Yes
Financial Incentive to Participant	--	Yes	Yes	--	--
DR Measure Cost: Rebate to Participant	--	Yes	Yes	Yes	Yes
DR Measure Cost: Participant Contribution	Yes	--	--	Yes	Yes
Participant Transaction Costs	Yes	--	--	Yes	Yes
Participant Value of Lost Service	Yes	--	--	Yes	Yes
Lost Revenues to the Utility	--	Yes	--	--	--
Non-Energy Costs	--	--	--	--	Yes

Demand Response Program Benefits

Benefit	Participant	RIM	PAC	TRC	Societal
Avoided Capacity Costs	--	Yes	Yes	Yes	Yes
Avoided Energy Costs	--	Yes	Yes	Yes	Yes
Avoided Transmission & Distribution Costs	--	Yes	Yes	Yes	Yes
Avoided Ancillary Service Costs	--	Yes	Yes	Yes	Yes
Avoided Line Losses	--	Yes	Yes	Yes	Yes
Improved Reliability	--	Yes	Yes	Yes	Yes
Revenues from Wholesale Market DR Programs	--	Yes	Yes	Yes	--
Market Price Suppression Effects	--	Yes	Yes	Yes	--
Participant Bill Savings	Yes	--	--	--	--
Financial Incentive to Participants	Yes	--	--	--	--
Non-Energy Benefits	Yes	--	Yes	Yes	Yes
Tax Credits	Yes	--	--	Yes	--
Other Benefits (e.g., market power mitigation, reduced price volatility, equitable pricing)	depends	depends	depends	depends	depends

(Preliminary) Topics for Further Research

- Avoided capacity costs:
  - Methodologies.
  - Models.
  - Adjustments.
- Participant costs:
  - Value of lost service.
  - Transaction costs.
- Ancillary services benefits.
  - Especially in supporting intermittent generation.
- Avoided transmission and distribution costs.

Contact Information:

Tim Woolf
Vice President
Synapse Energy Economics
617-453-7031
twoolf@synapse-energy.com

Lisa Schwartz
Senior Associate
Regulatory Assistance Project
802-498-0723
LSchwartz@raponline.org