

NYSERDA Industrial and Process Efficiency Program

VMUG - Rochester
March 23, 2010

Agenda

- Program Overview
- FlexTech
- IPE (Performance Based Incentives)
- NextGen
- Case Studies
- Benefits

Deployment Programs

- NYSERDA's IPE program is investing ~\$115 Million over two years
- Reduction Goal:
 - 840,000 MWh
 - 1,000,000 MMBtu
- Directly rewards Enterprise IT for sustainable, efficient load growth

What Do We Offer Clients?

- Clients are focused on their core business, NYSERDA provides:
 - Technical Assistance
 - Site and process specific
 - Customized engineering support
 - FlexTech Program
 - Financial Incentives
 - Deployment
 - Offset cost of installed improvement measures
 - Based on energy savings

Who is Willdan Energy Solutions (WES)?

- WES is under contract to NYSERDA to perform targeted outreach and assistance to the data center sector
- Thomas Hudgens is primary contact plus
 - Mehria Mihrzad
 - Diane Foy
 - thudgens@willdan.com
 - 212-785-0292

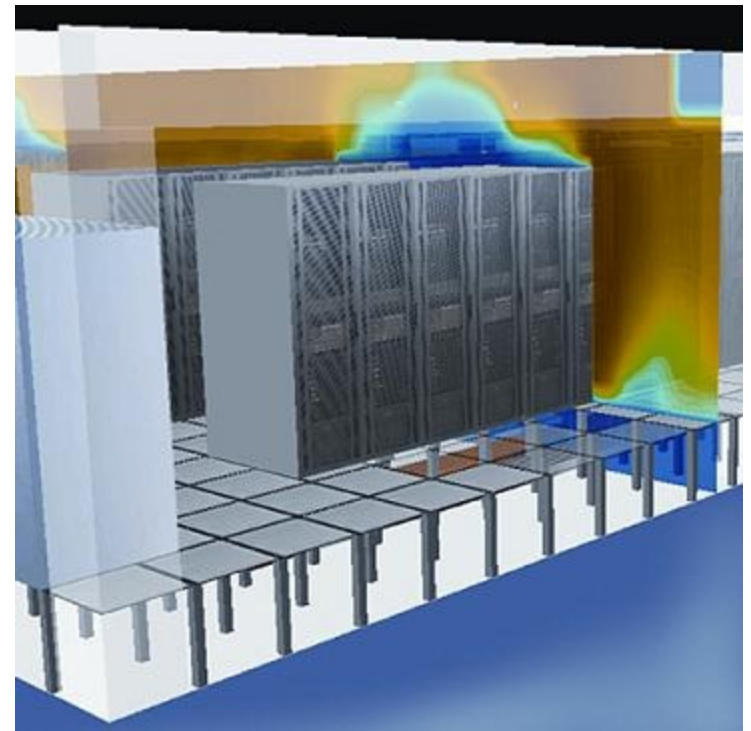
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FlexTech

Objective: *Provide cost-shared engineering studies for facilities and IT*

- Feasibility Studies
- Server load prioritization and optimization
- CFD Modeling
- Design Optimization
- And more...



FlexTech Offer

- 50% Cost Share
- Work with competitively selected technical expertise (if needed) or consultant of choice
- Technical and financial justification of projects
- Up to \$1 million
- Permanent metering can account for up to 50% of the study cost

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Industrial and Process Efficiency Incentives

- Incentives for energy saving process improvements
- Facilities
 - HVAC and UPS systems
 - Airflow management
- IT Infrastructure
 - Servers and storage
 - Virtualization and consolidation

Industrial and Process Efficiency Incentives

- Incentive is paid based on verified energy savings (\$0.12/kWh upstate, \$0.16/kWh in Con Edison)
- 50% of project costs up to \$5 million per project
- Large Projects Require M&V
- New Construction or Existing Facilities
- Program Overview:
http://www.nyserda.org/programs/Commercial_Industrial/default.asp?i=2

Industrial and Process Efficiency Incentives

- Customer submits application
- NYSERDA PM assigned
- PM assigns Technical Reviewer (TR)
- TR performs pre-installation site visit
- TR submits DEA
 - Project is encumbered
- TR performs post-installation site visit
 - 60% or 100% payment made to customer
- TR and customer perform M&V (if necessary)
 - Remaining incentive payment made (if necessary)

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Next Generation Technologies for End-Use Efficiency

- The NextGen Program funds development or demonstration of cutting edge energy efficient technology
- Program focus on Data Centers and IT efficiency
- Project Types:
 - Technology Feasibility Studies
 - Product Development
 - Demonstration of new and emerging technologies
- \$4.9M over three rounds, awards up to \$300k
- Due Dates: 4/15, 7/15, 10/14

Next Generation Technologies for End-Use Efficiency

- **Past & Currently Funded NextGen Activities:**
- **Advanced Concepts High Performance Computing Data Center pilot**
 - Energy-Conscious Scheduling of Linux Servers
 - Data Center Virtualization Demonstration
 - Thin-client Demonstration
 - Free cooling operation & UPS and Flywheel technology Demo
- **Other Areas for Consideration:**
 - Energy Efficient Computing Operation Technologies
 - Innovative Data Center HVAC Systems
 - Next Generation Equipment Cooling
 - Energy Efficient Data Center Equipment
 - Energy Efficient Methods of Power Conversion and Distribution
 - Power Reduction Technologies for Server Loads or Data Storage Systems

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Case Study: Virtualization

Client XXXXX
 Location Brooklyn, NY
 Data Center
 Type of Facility Center

	\$/kWh
ConEd	0.16
Cost of Electricity	0.18
Number of Servers before virtualization	200
Number of Servers after virtualization	10

Energy Saving Measure	Energy Savings					
	Baseline Usage	Installed Usage	Energy Savings	Electric Cost Savings	Incentive Rate	Total Incentive
	kWh/Yr	kWh/Yr	kWh/Yr	\$/yr	\$/kWh	\$
Install Virtual Server - Direct Energy Savings	394,200	19,710	374,490	\$ 67,408.20	0.16	\$ 59,918.40
Install Virtual Server - Indirect Equipment Support Savings	242,545	12,127	230,418	\$ 41,475.17	0.16	\$ 36,866.82
Combined	636,745	31,837	604,908	\$ 108,883.37	N/A	\$ 96,785.22



Case Study: Optimized Cooling Solution for New Data Center

Five (5) standard CRAC Units, no economizers, no
High Density cooling solution

BASELINE CASE	Total kWh / Year/Unit	188,203
	Unit Quantity	<u>5</u>
	Total kWh / Year	<u><u>941,015</u></u>

Three (3) CRAC Units with economizers plus
High Density cooling solution

PREFERRED CASE	Three (3) CRAC Units	364,910
	High Density Solution	<u>274,405</u>
	Total kWh / Year	<u><u>639,314</u></u>

SUMMARY	BASE CASE kWh/year	941,015
	PREFERRED CASE kWh/year	<u>639,314</u>
	Annual kWh Savings	<u><u>301,701</u></u>
	Projected NYSERDA Incentive \$	<u><u>48,272</u></u>

Simple Payback Period **< 1 year**

Case Study: Financial Customer

Customer NYX

Summary of kW/kWh Savings

Item	kW	kWh
Cooling System (Energy Model Phase 1 Alternative 1A)	98	780,000
IT SAN Disk Storage Replacement	9	78,840
Server Harvesting (Old Server Clean Up)	79.8	699,048
Server Virtualization	42	367,920
Sub-Total	229	1,925,808
Building Control System Improvements (10% Reduction)	32.9	205,581
Total	262	2,131,389

Project Cost	\$ 1,900,000
Annual Energy Savings	\$ 275,000
NYSERDA Incentive	\$ 255,767
Simple Payback Period	~6 Years

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Summary of Benefits

- Incentive monies available can buy down capital costs of energy efficiency projects and improve payback
- FlexTech cost share can be leveraged with customer base
- NextGen can open opportunities with new customers or new technologies
- A deep understanding of NYSERDA incentives is valuable to help plan projects
 - Use NYSERDA & WES as resources