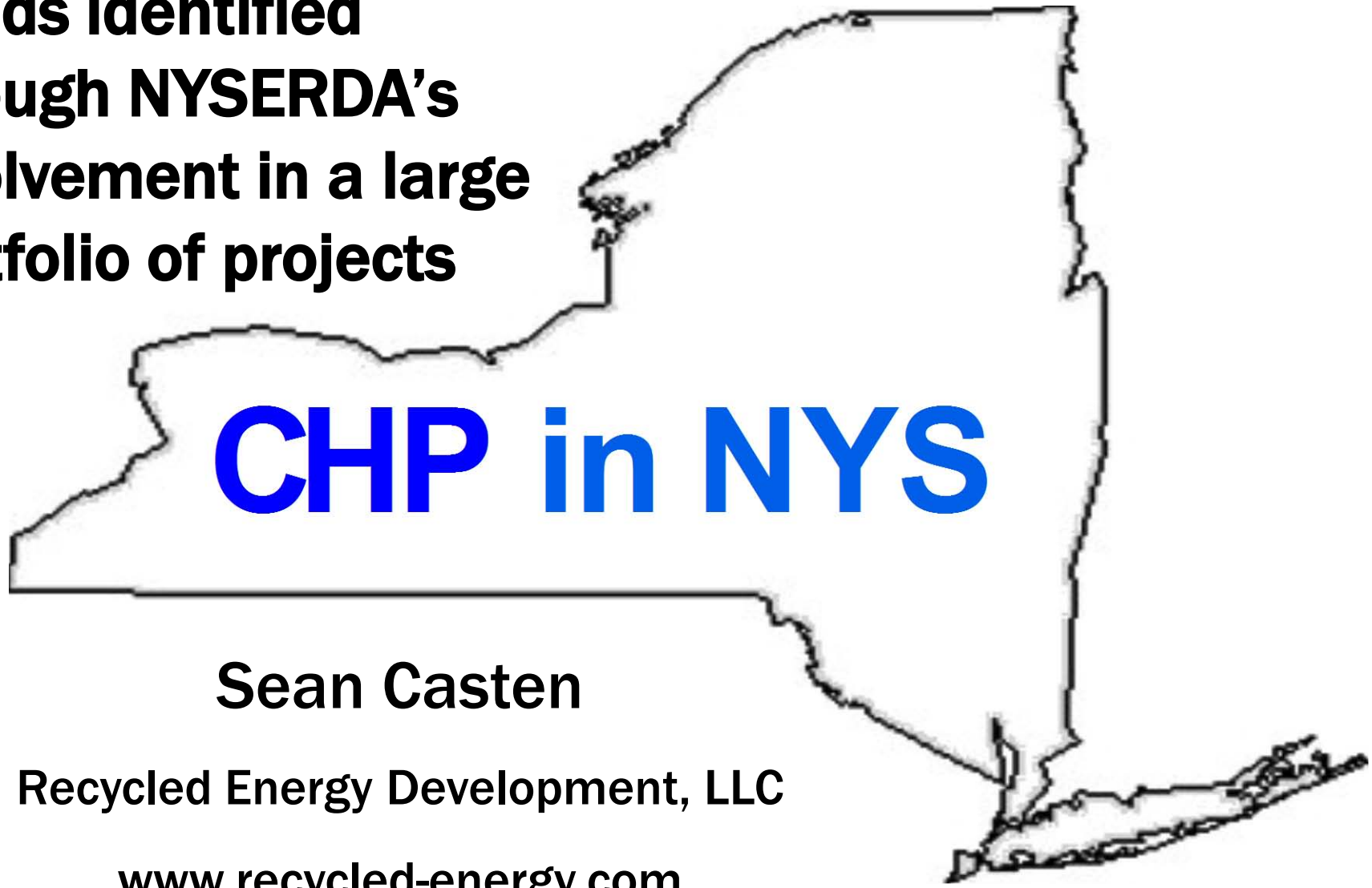
Opportunity and pitfall trends identified through NYSERDA's involvement in a large portfolio of projects



CHP in NYS

Sean Casten

Recycled Energy Development, LLC

www.recycled-energy.com

DG/CHP: Personal History

- ⇨ Turbosteam → RED
- ⇨ Small ($<2MM) projects → Big (>$20MM) projects
- ⇨ Capital equipment supply → energy outsourcer

- ⇨ Significant gap in the expertise available to the smaller project, which NYSERDA fills critically in NY.

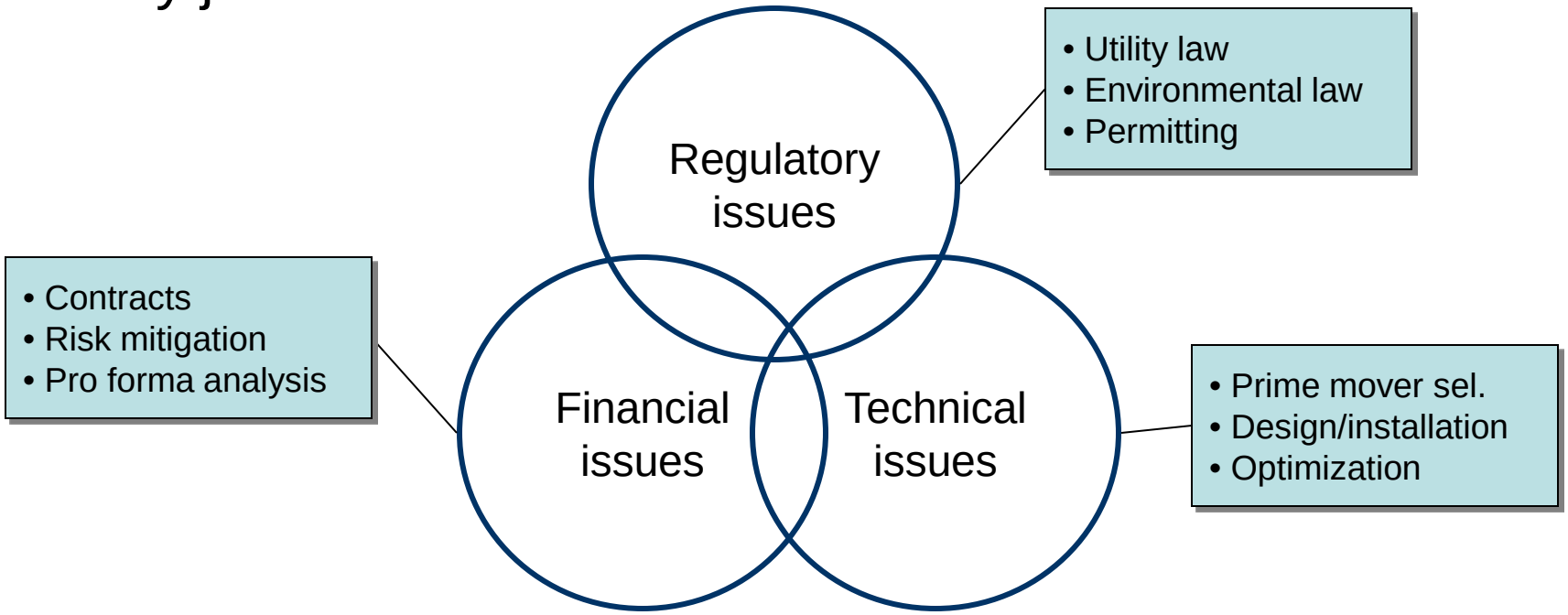
NYSERDA

New York Energy Smart™
Public Service Commission
NYSERDA

Small project "gap"

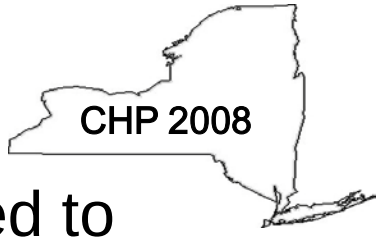
CHP 2008

⇨ Small projects are no less complicated than big ones; they just have less room for error



⇨ Many orgs have expertise in one or two circles; few in all three (especially for smaller projects)

The dirty secret



- ⇨ Many DG/CHP organizations recognize the need to integrate all three skills.
  - Some consciously choose not to integrate, to minimize overhead exposure – but this leaves end-user responsible for coordination
  - Others seek to “learn on their customer’s nickel”, leaving end-user at risk for their learning.

- ⇨ Both models are reasonable, in light of small DG economics; but it behooves end-users to bring experienced integration skills into mix
  - Look for experience – including experience of failure.

Regulatory

Financial

Technical

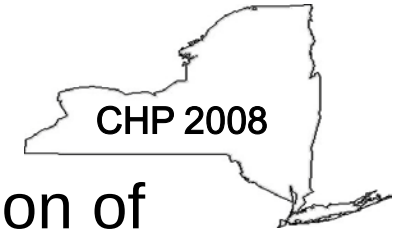
Success Stories

Regulatory lesson 1

- ⇨ Interconnect shenanigans: utilities satisfy letter, but not spirit of IC process
  - Example 1: NY Interconnect law requires applicant to develop a interconnect testing protocol, submit for utility approval, schedule and conduct test. Multiple examples of utility reps "declaring failure" at first error in test, then not being able to reschedule for 30+ days. (3 distinct occurrences in NYSERDA portfolio: Allied Converter, VIP Country Club, Onondaga County)
  - *Personal experience: Buffalo hospital / fault current limits*

- ⇨ Lesson: utility discretion in IC standards misalign economic interests of utility and interconnecting applicant. Resolution often requires someone on customer's side who knows how to spot the difference between technical and economic objections.

Regulatory lesson 2



- ⇨ Insufficient regulatory experience / misapplication of municipal laws
  - Example 1: Harbec Northern Biodiesel sought to install an anaerobic digester in Ontario, NY. Municipal officials applied code standards that were written for nuclear plants to impose unrealistic permitting requirements on this "energy facility".
  - Example 2: Hooligans (Syracuse) sought to install a 6 kW microCHP system; building inspector used a code based on central-station, thermal power plants.
  - *Personal experience: steam operator laws*

- ⇨ Lesson: Regulation rarely keeps up with the pace of technological advance. Be patient – and learn to speak the regulator's language.

Regulatory

Financial

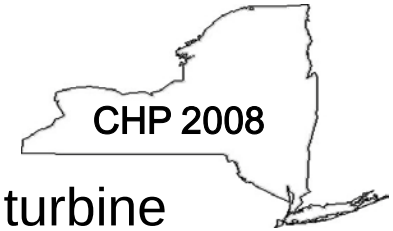
Technical

Success Stories

Financial Issues 1

- ⇨ Gas contracts / regulatory shenanigans
  - Example 1: Hermany Farms sought to install a CHP system, using existing gas infrastructure. ConEd looked at historic boiler demand, new CHP demand and concluded that they needed a new supply line, failing to take load-shifting into account. Hermany was ultimately forced to install unnecessary gas distribution at their own expense.
  - Example 2: In three distinct (known) instances, CHP customer was informed that there was sufficient gas supply, then later that they would have to pay to upgrade system. NYSERDA was able to leverage PSC contacts to request supporting pipeline data – which magically increased system capacity. (Sheraton Hotel, NY Racket & Tennis Club, 717 5th Ave.)

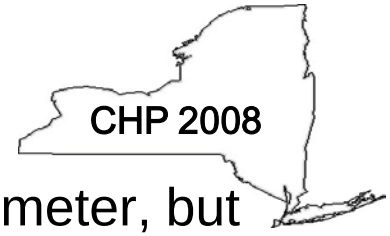
Financial Issues 1 (2)



- Example 3: NY Presbyterian Hospital installed a gas turbine which needs pressurized gas. There is a high-pressure gas line owned by ConEd nearby, but ConEd has indicated that they do not want to sell from that line. NYPH has purchased a gas booster compressor as redundant backup – adds capex, opex and an energy efficiency penalty. Discussions are on-going.

- *Personal experience: LDC / Transco conflict on cogen*

Financial Issues 1 (3)



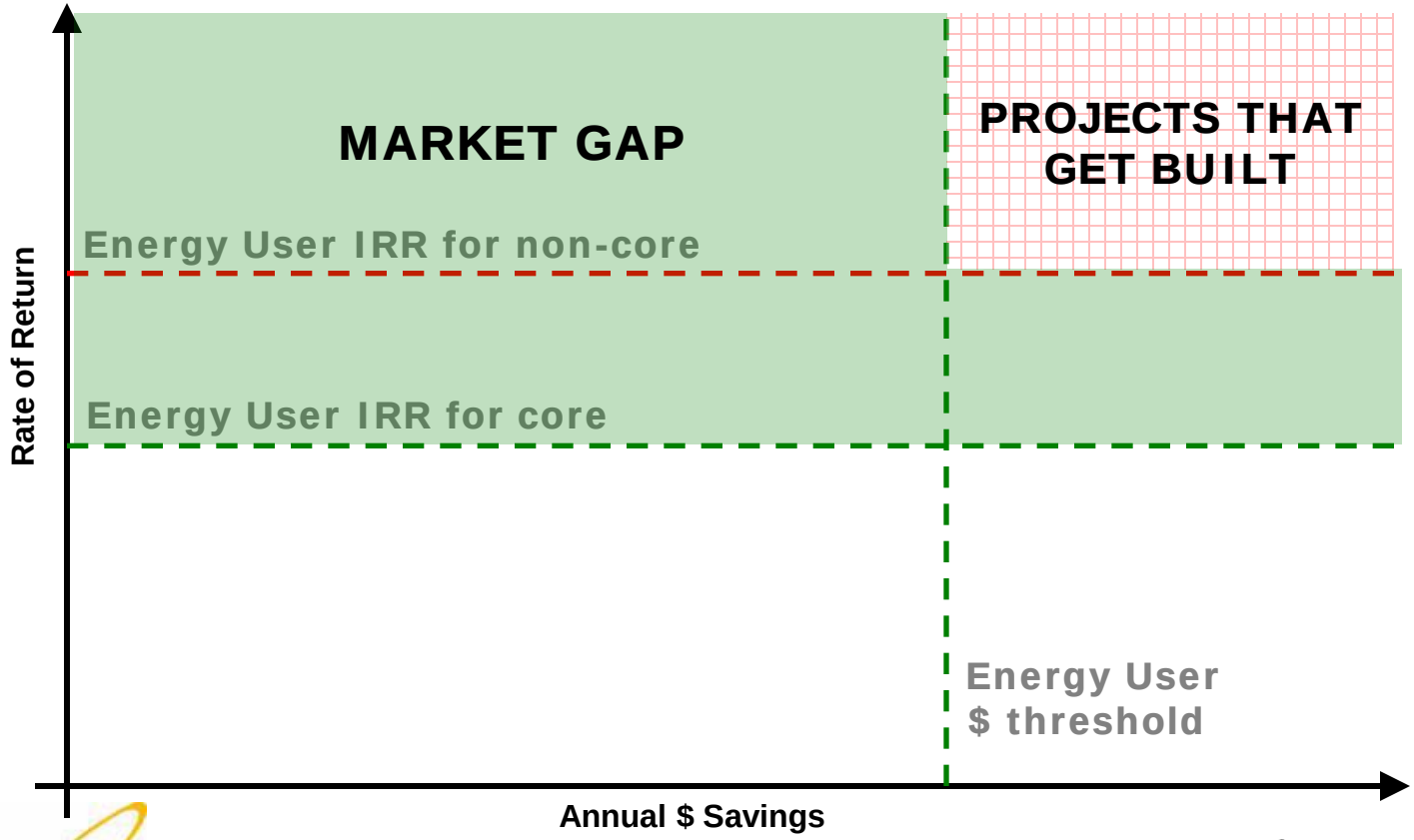
- Example 4: Madison Oneida Boces has a single gas meter, but two separate internal spurs: one to serve their DG system and one to serve their other needs. National Grid argued that in order to access discounted NY gas rates for DG, they would have to install a dedicated gas line. (Submetering was the NGrid billing function.) NYSERDA weighed in with the PSC, who leaned on NGrid who subsequently agreed to… install the new gas line at their cost. (!)

⇨ Lesson: CHP creates conflicting financial pressures on integrated gas/electric utilities. Understanding these pressures – and knowing the levers to resolve – can be critical to CHP project execution.

Financial Issues 2

CHP 2008

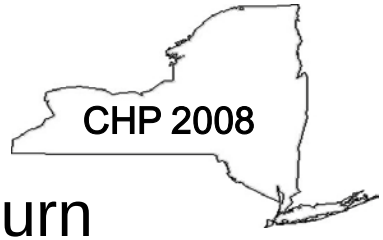
⇨ Project developers often misunderstand risk/return characteristics *as perceived by their customers*.



NYSERDA

New York Energy Smart
Public Service Commission
NYSERDA

Financial Issues 2



- ⇨ Project developers often misunderstand risk/return characteristics *as perceived by their customers*.
  - Commercial buildings often have split incentives, with building owners not responsible for energy bill (MetroTech)
  - Changes in ownership can steal executive "bandwidth" and stall decisions on capital purchases indefinitely (Blackstone)
  - *Personal experience: too many to mention!*

- ⇨ Lesson: Get commercial buy-in first, technical buy-in later. Know what the minefields look like, so you can minimize unproductive commitment of resources.

Financial Issues 3

CHP 2008

- ⇨ Financial analysis not done by party with equity risk; mis-state costs & benefits
  - Failure to take into account long-term O&M costs
  - Failure to account for thermal de-rating
  - Failure to account for parasitic losses
  - Many others – fundamentally a “too many cooks” problem.

- ⇨ Lesson: If equity has expertise, use it. If equity doesn’t have expertise, make sure it partners up with someone who does.

NYSERDA

New York Energy Smart™ Public Service Commission NYSERDA

Regulatory

Financial

Technical

Success Stories

Technical Issues 1

CHP 2008

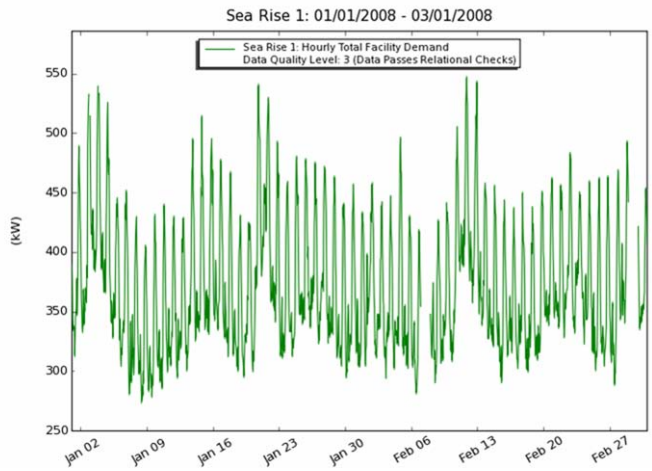
- Use of Monthly Data
  - Design needs to include sufficient granularity in electric and thermal energy use. The appropriate level of granularity for design may exceed the quality of pre-existing meters (especially for thermal loads).

Same load, different granularity!

CHP 2008

Facilities Included: Grenadier Realty - AAF Sea Rise 1 - Brooklyn, NY

Download CSV Data



NYSERDA

New York Energy Smart
Public Service Commission
NYSERDA

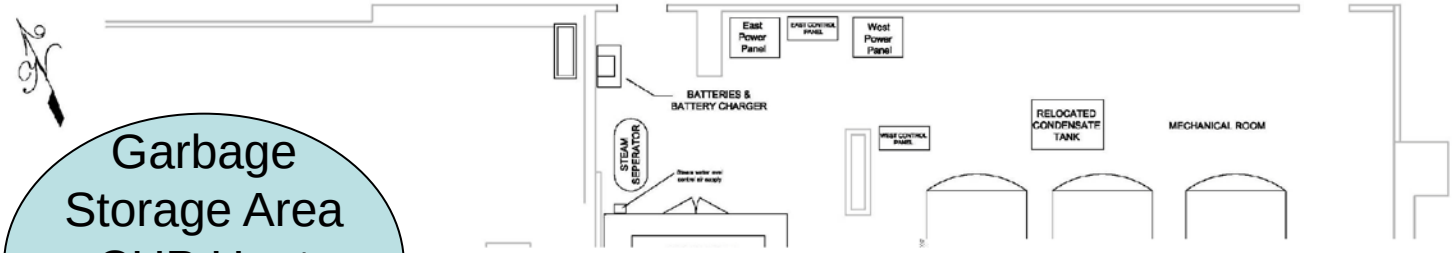
Technical Issues 2

CHP 2008

- Building HVAC Issues
  - Multiple instances in which air intakes and/or exhausts did not take into account building geometries. De-rates, adverse building HVAC consequences and odors result (see next)
  - *Personal Experience: RI hospital, Buffalo hospital*

Technical Issues 2

CHP 2008



Garbage Storage Area CHP Heat Worsens Odors

CHP system in basement of multifamily residential building

Regulatory

Financial

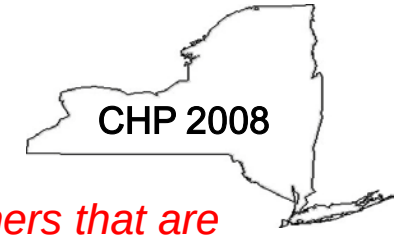
Technical

Success Stories

Success Stories: Technical

- ⇨ Design to thermal load, not electric.
- ⇨ Thermal storage to level building loads
- ⇨ Technology development responsive to market opportunities

Success Stories: Flex rates



"Proposed guideline II.E provides as follows:
Utilities shall not offer [flexible] rate contracts as an alternative to customers that are considering the installation of [distributed generation (DG)] systems. The public policy of the State is to encourage DG installations, but [flexible] rate offers may obstruct those installations. Recently-established standby rates for back-up and other utility delivery service to customers that self-supply with DG, which can be flexed as an alternative to the "islanding" of a DG installation, are a satisfactory replacement for the prior policy of allowing [flexible] rate alternatives to DG installations themselves…

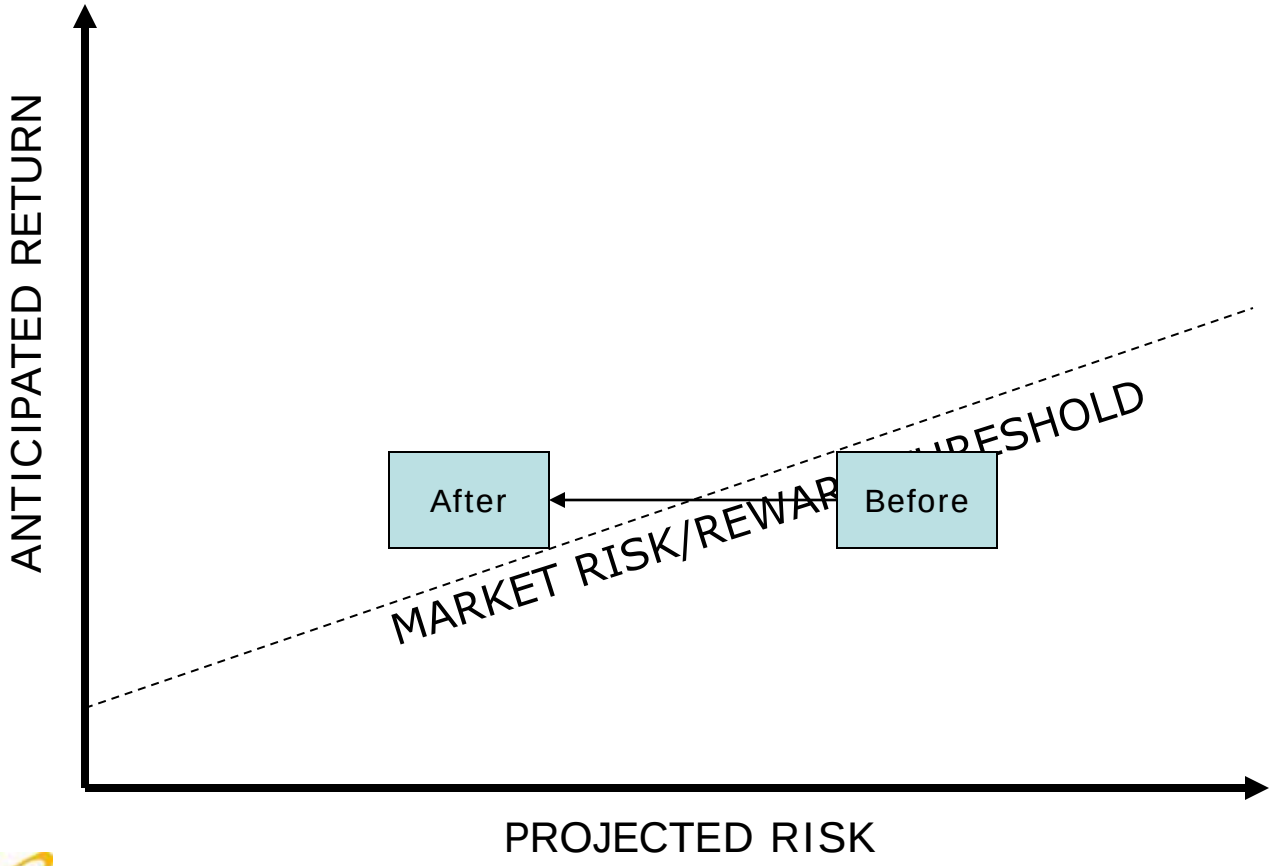
The proposed restriction is supported by NYSERDA, NYPA, and NFG. NYSERDA raises the following argument (with which NYPA concurs):
'With regard to economic development, where a customer is considering the installation of on-site generation, and particularly where that alternative is truly 'realistic,' the community is not faced with the threat of job losses and the peripheral economic damage that results from plant closings or relocation. In fact, the installation of on-site generation represents a capital infrastructure investment in New York. Simply stated, the use of [flexible] rates in competition with on-site generation is in neither the ratepayer nor the public interest.' "

Source: New York State "Order Approving Guidelines for Flexible Rate Service Contracts", issued April 14, 2005. http://www3.dps.state.ny.us/pscweb/WebFileRoom.nsf/Web/7D3D3D86BE80CEB585256FE30047F413/$File/03e1761.ord.04.14.05.pdf?OpenElement

NYSERDA

New York Energy Smart℠
Public Service Commission
NYSERDA

Success Stories: Sanity Check



NYSERDA

New York Energy Smart
Public Service Commission
NYSERDA

Success Stories: Operating History

- ⇨ Of 51 NYSERDA-funded projects that have been commissioned, 50 are currently operating.

- ⇨ Good sales people can sell shoddy projects – but the proof of a good project is that it's in the operator's interest to keep it running.
  - This operating history is the single strongest testament for NYSERDA's program.