

Power by the People

Demand Response

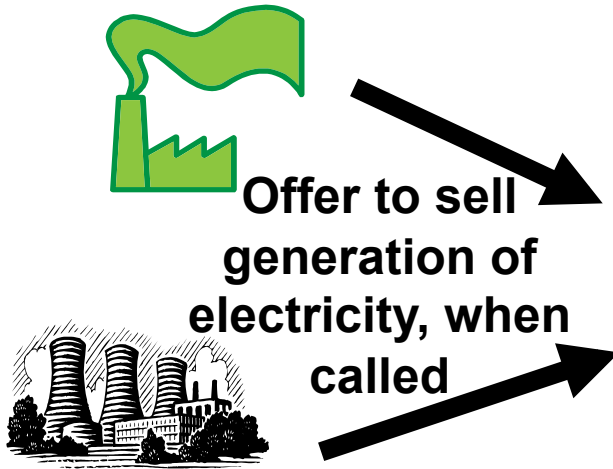
“Free-Markets”

Respond2010; VaasaETT;

Exchange 2010 May 27th, 2010

The US “RTO” Electric Market

Generators



Clearing house for bids and offers to buy and sell

Marketers



Bid to buy electric supply



Marketers then sell to consumers

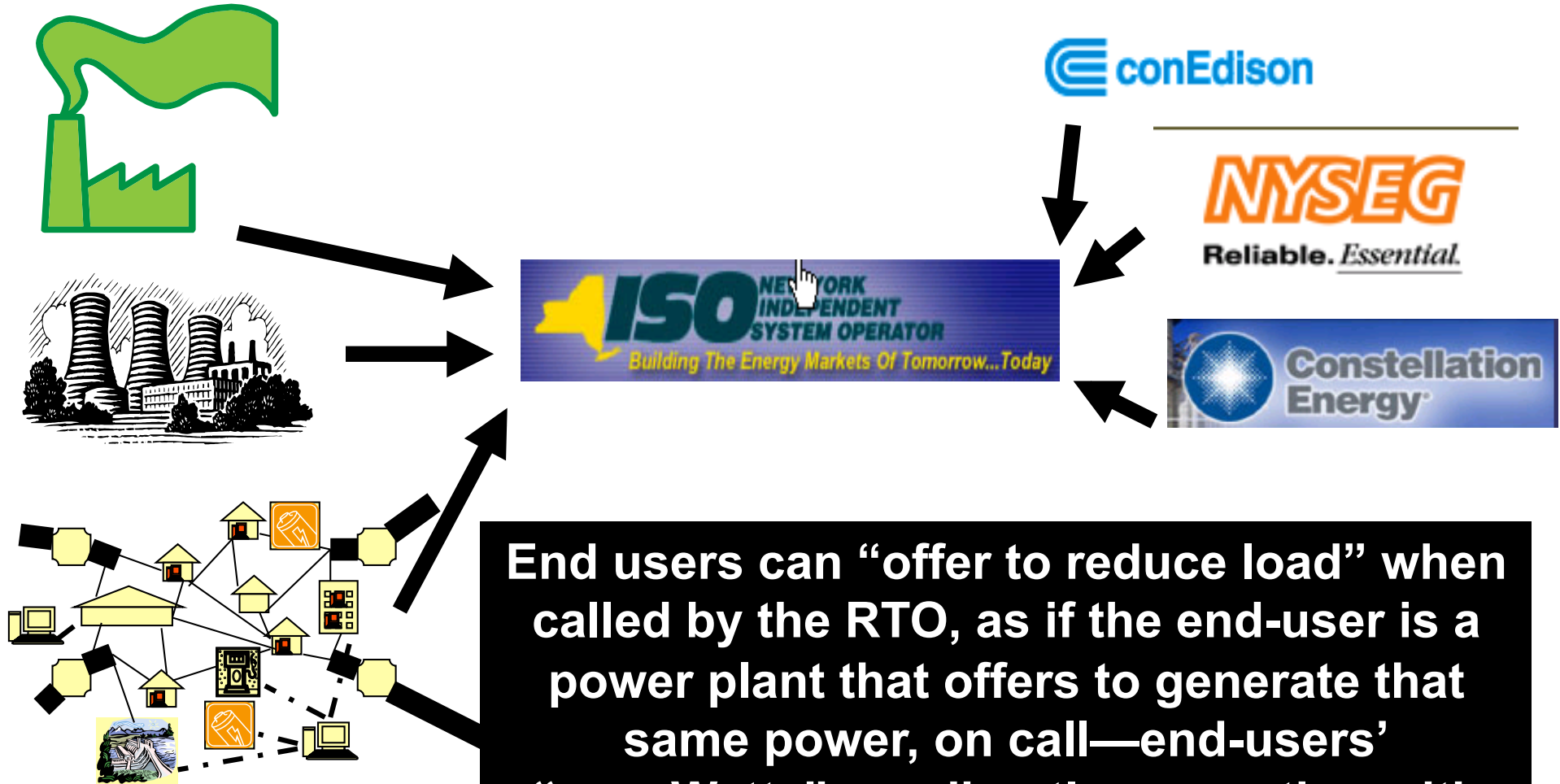
The **only** differences between utilities and “free-marketers” of electricity are that:

1. Utilities also own the transmission and distribution lines, and get paid for the movement of electricity
2. Utilities must purchase power for, and sell power to, anyone who asks
3. Utility rates are regulated by the Public Service Commission

The Electric Market

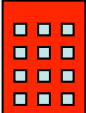
Generators

Marketers



End users can “offer to reduce load” when called by the RTO, as if the end-user is a power plant that offers to generate that same power, on call—end-users’ “negaWatts” are directly competing with “megaWatts” of generation

Homes, buildings, institutions, industrials:



Transmission:



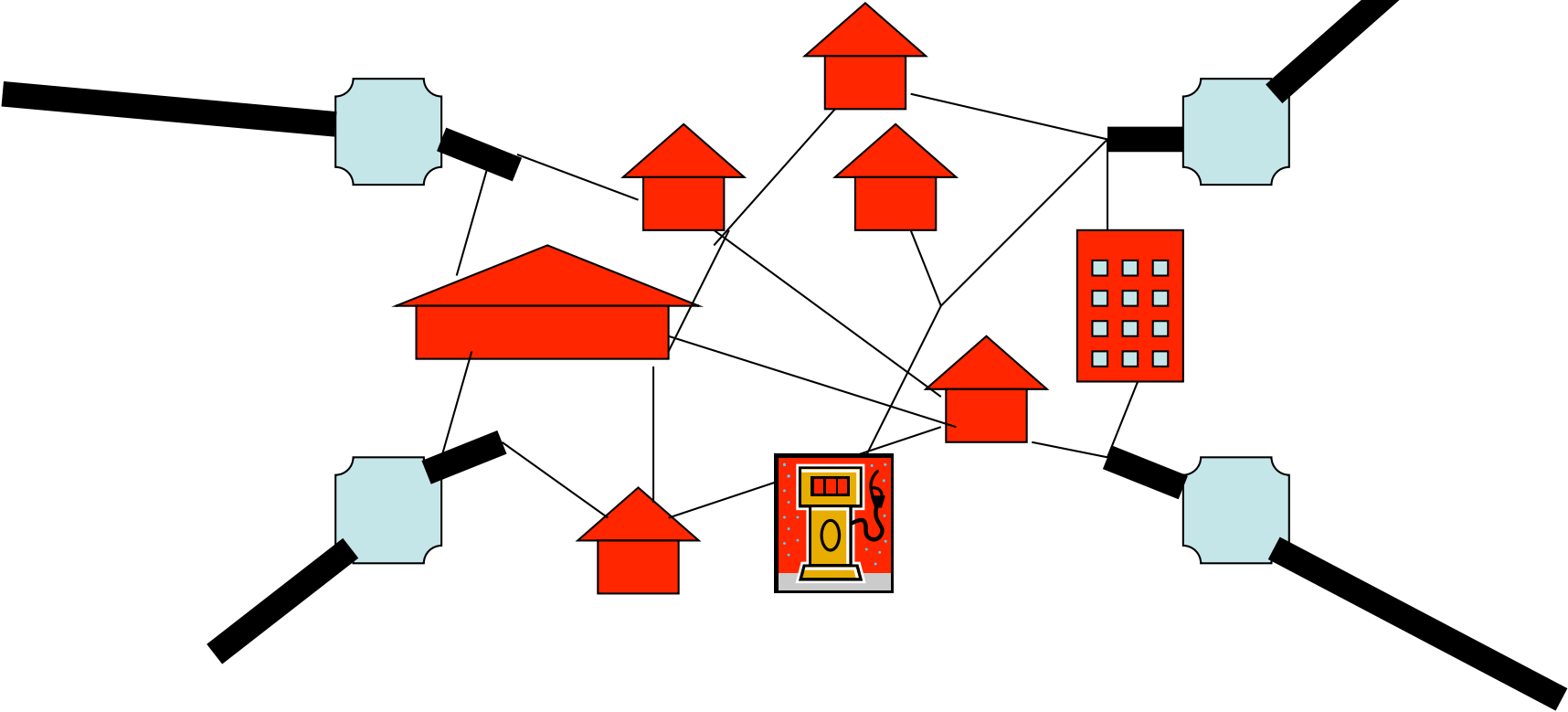
Distribution:



Measurement:



The Northern Westchester Energy Action Consortium (14 towns) is taking all steps to become one large provider of NegaWatts and of distributed MegaWatts



The Electric Market

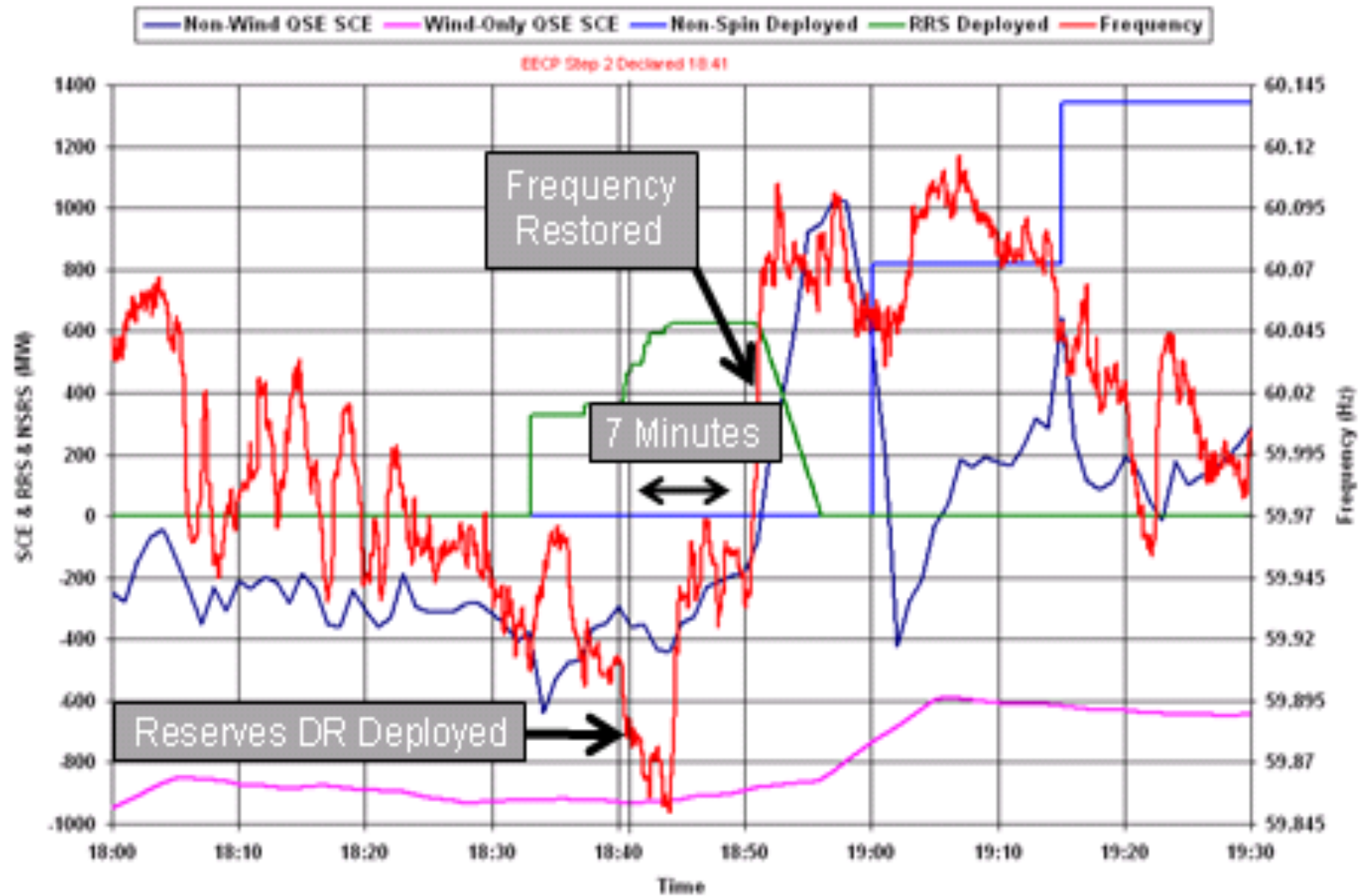
Generators

Marketers



Once we have meters in place, our community can then sell its “offer to reduce load” when called by the ISO, just like it is a power plant that offers to generate that same power, on call—our negaWatts are directly competing with “megaWatts” of generation

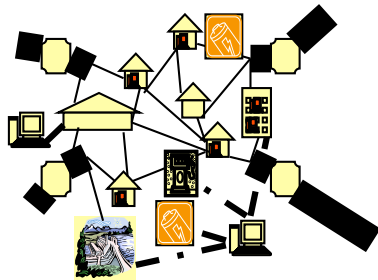
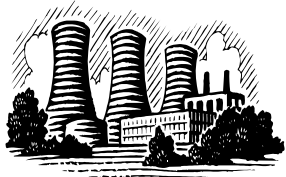
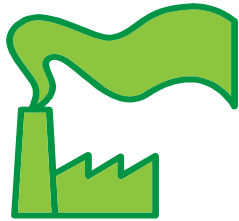
Will EVs & UPS' Provide Power Quality?



Electric Market Products

Generators Sell

Marketers Buy



<p>Energy</p>	<p>Once every night the NYISO holds an auction for each hour's needs the next day</p>
<p>Capacity</p>	<p>The NYISO holds several auctions for power plants to be available to turn up (or for load to be available to reduce) for two- to six hours, generally called two-to four times a year (capacity get two hours notice)</p>
<p>Reserves</p>	<p>The NYISO holds nightly auctions for power plants to be available to turn up (or for load to be available to reduce) for twenty minutes, generally two- to four times a month (gets one minute notice)</p>
<p>Regulation</p>	<p>The NYISO holds nightly auctions for power plants to be available to turn up or down (or for load to be available to reduce or to consume more) for very short bursts, quite frequently (gets six seconds notice)</p>

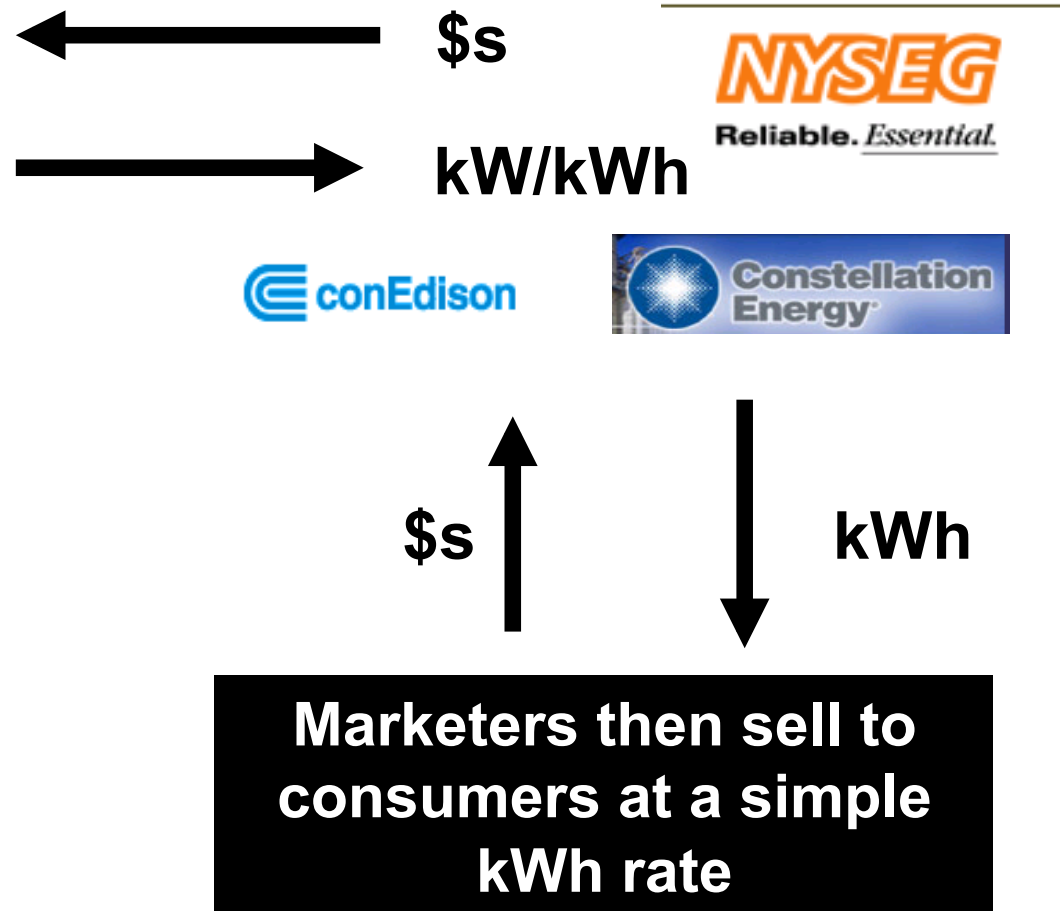


Electric Market Products

Generators Sell & Marketers Buy

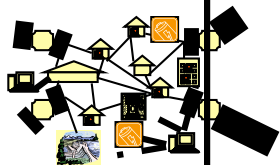
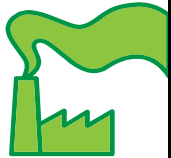
Marketers must buy a certain amount of each product for each customer, depending on how much energy each customer uses in each hour and at the time that the system peaks

Energy	\$.02 - \$1 per kWh
Capacity	\$50 - \$100 Per kW/year
Reserves	\$40 - \$80 Per kW/year
Regulation	\$200 - \$400 Per kW/year



Projected Earnings

Generators Sell & Marketers Buy



Product	\$s per unit/ units per household	Approx # of hours per year it is called	Annual \$s per 5,000 homes
Energy	--	8760	Technology driven
Capacity	\$60/.5kW	20	\$75,000
Reserves	\$60/.5kW	10	\$75,000
Regulation	\$300/1kW	100	\$400,000

Introduced in the US Senate Today

- 11 “(1) IN GENERAL.—Each electric consumer in
- 12 the United States shall have the right to access (and
- 13 to authorize 1 or more third parties to access) retail
- 14 electric energy information of the electric consumer
- 15 in an electronic form, in conformity with nationally
- 16 recognized open standards, free of charge, and in a
- 17 manner that is timely and convenient and that pro
- 18 vides adequate protections for the security of the in
- 19 formation and the privacy of the electric consumer.

Topics for Discussion

- **DO as service company: a high-growth opportunity?**
- **What is (are) the central service(s) that DOs provide?**
- **What services do PDR, capacity, energy management, reserves DR, EE, Distributed renewable generation spawn?**
- **What's the value of S/T DR with ubiquitous intermittents?**
- **Thin-server technology and diversification of supply?**

Topics for Discussion (2)

- Dealing with Regulators: economic sense v. serving the constituency
- Empowerment & simple transparency: undervalued assets?
- Do we start with accepting some losers or do we go for only the “dead-weight gain?”
- Renewables and DR/storage: natural partners?
- DR as an insurance product: pay for availability?

Topics for Discussion (3)

- Low-risk market entry; the EBAY model: sizing the market
- Creating an open market: all qualified comers?
- Standardization: electricity market product structures? Interoperability standards?
- Is mass-market Smart Grid synonymous with Smart Meters?
- Do uniform roll-outs of Smart Meters set the stage to abort the Smart Grid vision?