



## UNDERSTANDING the ONTARIO ELECTRICITY MARKET and MANAGING ELECTRICITY COSTS

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# Agenda

1. Regulated Price Plan
2. Market coverage, actual spot price exposure
3. Buying basics, considerations
4. Savings opportunities
5. Food for thought

## Aegent helps energy-sensitive buyers to...

- reduce the cost
- manage the risk
- resolve the complexity  
of gas and power procurement

# Regulated Price Plan (RPP) - Friend or Foe ?

Mixed messages:

“I’m from the government and I’m here to help  
you”

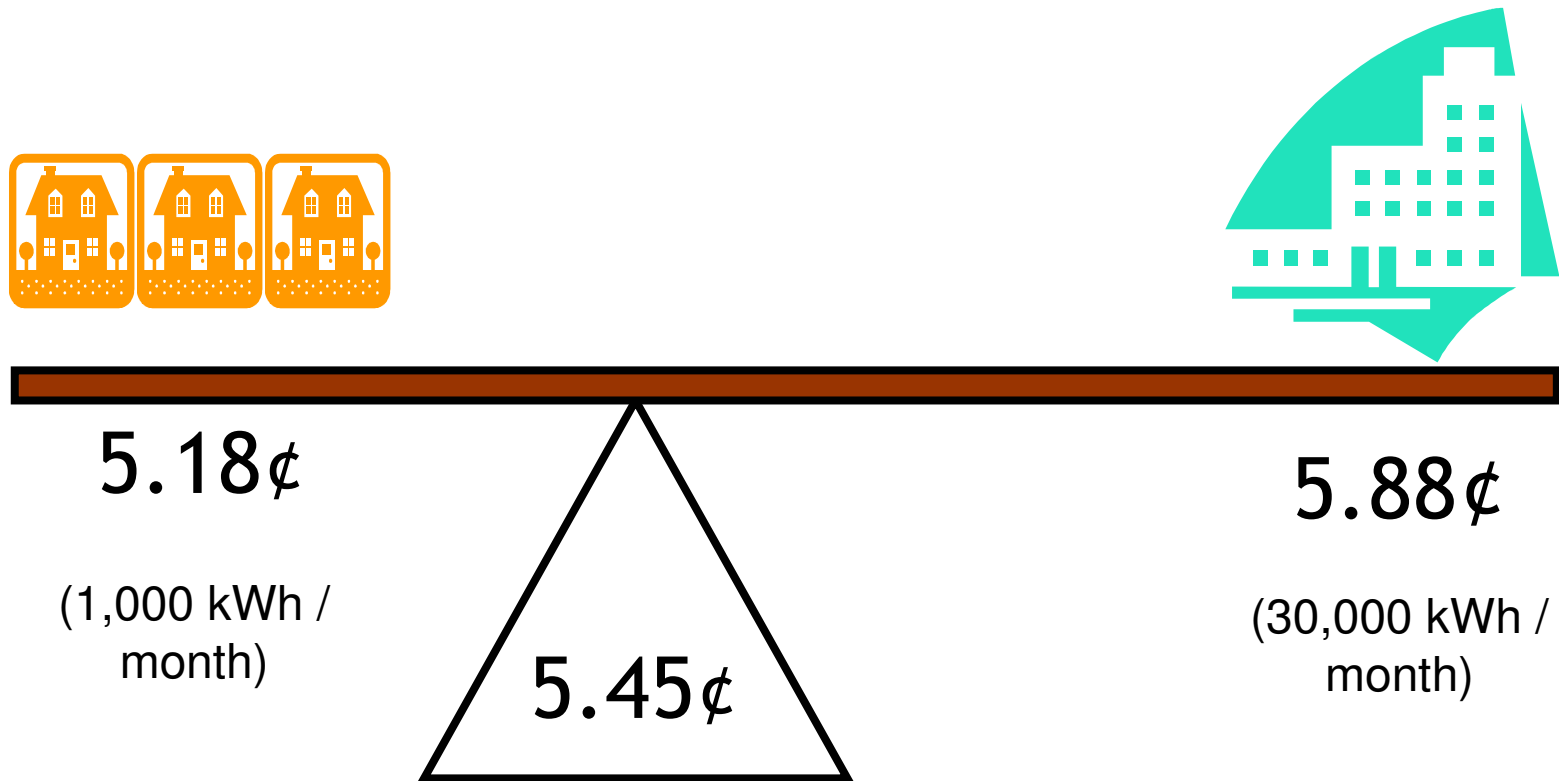
or

“OK, we all had the same thing to eat but some of  
you will be paying more than others”

## Conventional RPP: Foe

- Large “designated consumers” subsidize lower-volume consumers and so pay more inside the RPP than they would pay on the spot market
- The RPP price for large volume “designated consumers” is higher than the net cost outside of the plan
- The RPP provides no more price risk protection than if one was off the RPP - variance is the tip-off
- Monthly variance amount can be calculated and must be added to RPP rate to get true RPP price

# Conventional RPP Cross-Subsidy



# Smart Meter RPP

- It's coming
- Rates ...
  - Vary by season, time of day
  - Are, at least in theory, based on actual pricing
  - Are arbitrary (3x:2x:1x pricing), leading to cross-subsidies
  - Will drive price response and demand management, but how equitably ?

# Smart Meter RPP

Smart Meter RPP	On-Peak	Mid-Peak	Off-Peak	On-Peak	Mid-Peak	Off-Peak
	cents / kWh			ratios, reference = Off-Peak		
Apr05 - Apr06	9.3	6.4	2.9	<b>3.2</b>	<b>2.2</b>	1.0
May06 - Oct06	10.5	7.5	3.5	<b>3.0</b>	<b>2.1</b>	1.0
Nov06 - Apr07	9.7	7.1	3.4	<b>2.9</b>	<b>2.1</b>	1.0
May07 - Oct07	9.2	7.2	3.2	<b>2.9</b>	<b>2.3</b>	1.0
Nov07 - Apr08	8.7	7.0	3.0	<b>2.9</b>	<b>2.3</b>	1.0
May08 - Oct08	9.3	7.3	2.7	<b>3.4</b>	<b>2.7</b>	1.0

Pw <sub>net</sub> = Pthnsls less GA, OPR	On-Peak	Mid-Peak	Off-Peak	On-Peak	Mid-Peak	Off-Peak
	cents / kWh			ratios, reference = Off-Peak		
Apr05 - Dec06	7.9	6.5	4.3	<b>1.9</b>	<b>1.5</b>	1.0

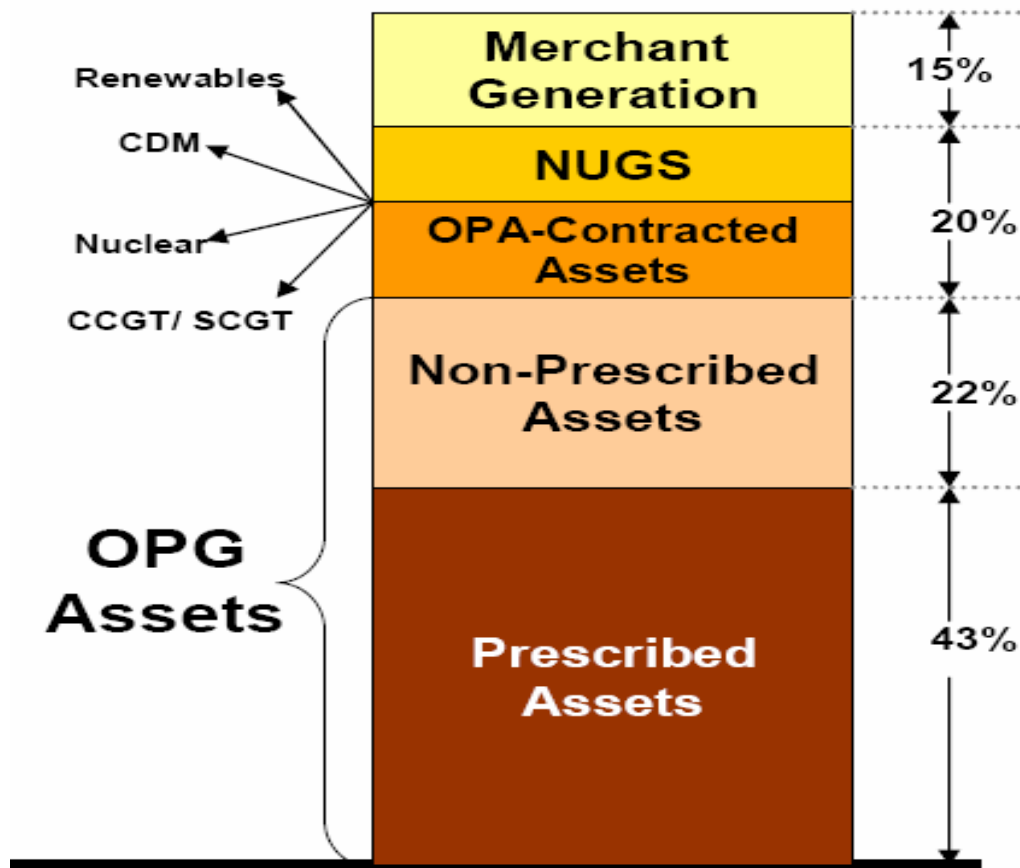
# Market Coverage - Background

- Extent to which spot price exposure is reduced by fixed-price arrangements
  - April 2002 (market opening): ~ 51 % fixed pricing via Market Power Mitigation Agreement)
  - May 2003: 50 % fixed pricing via Business Protection Plan
  - April 2005: > 65 %
  - Current: > 75 %
- } via Global Adjustment (GA),  
Ontario Power Generation  
rebate (OPGR)

# Market Coverage - Overview

- Global Adjustment
- Ontario Power Generation Rebate
- Legacy Non-Utility Generators (NUGs)
- Ontario Power Authority (OPA)
  - New generators
  - Conservation and demand managements
  - Fixed price and fixed expenditure commitments
- Monthly net price variations greatly reduced
- Result is greatly reduced range of outcomes and hence less risk

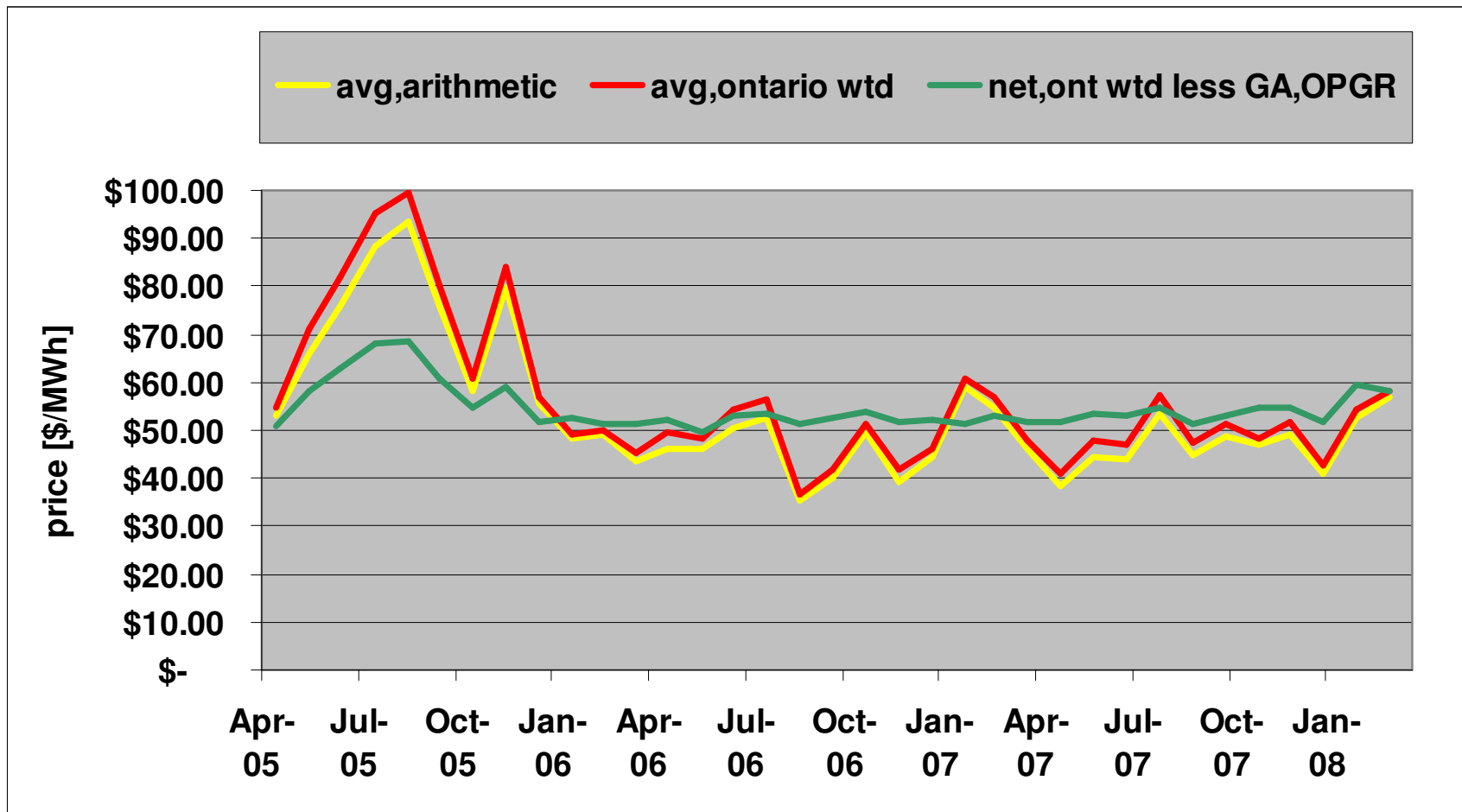
# What % of the Genie is Still Out of Bottle ?



(source: OPA)

- Factor in:
- Price the different sources displace (seasonal, time-of-day)
- Your own load shape
- Not much left

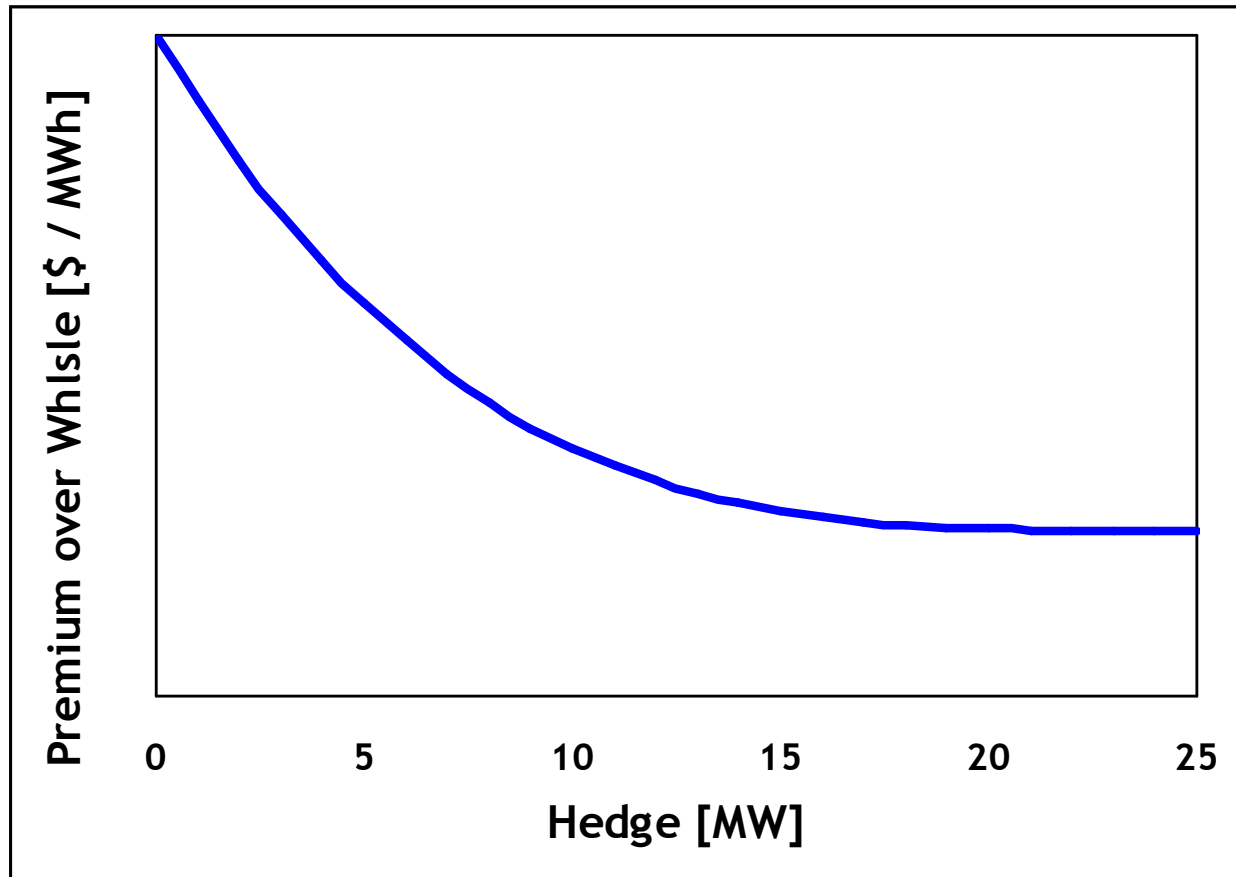
# Market Coverage Dampens Volatility



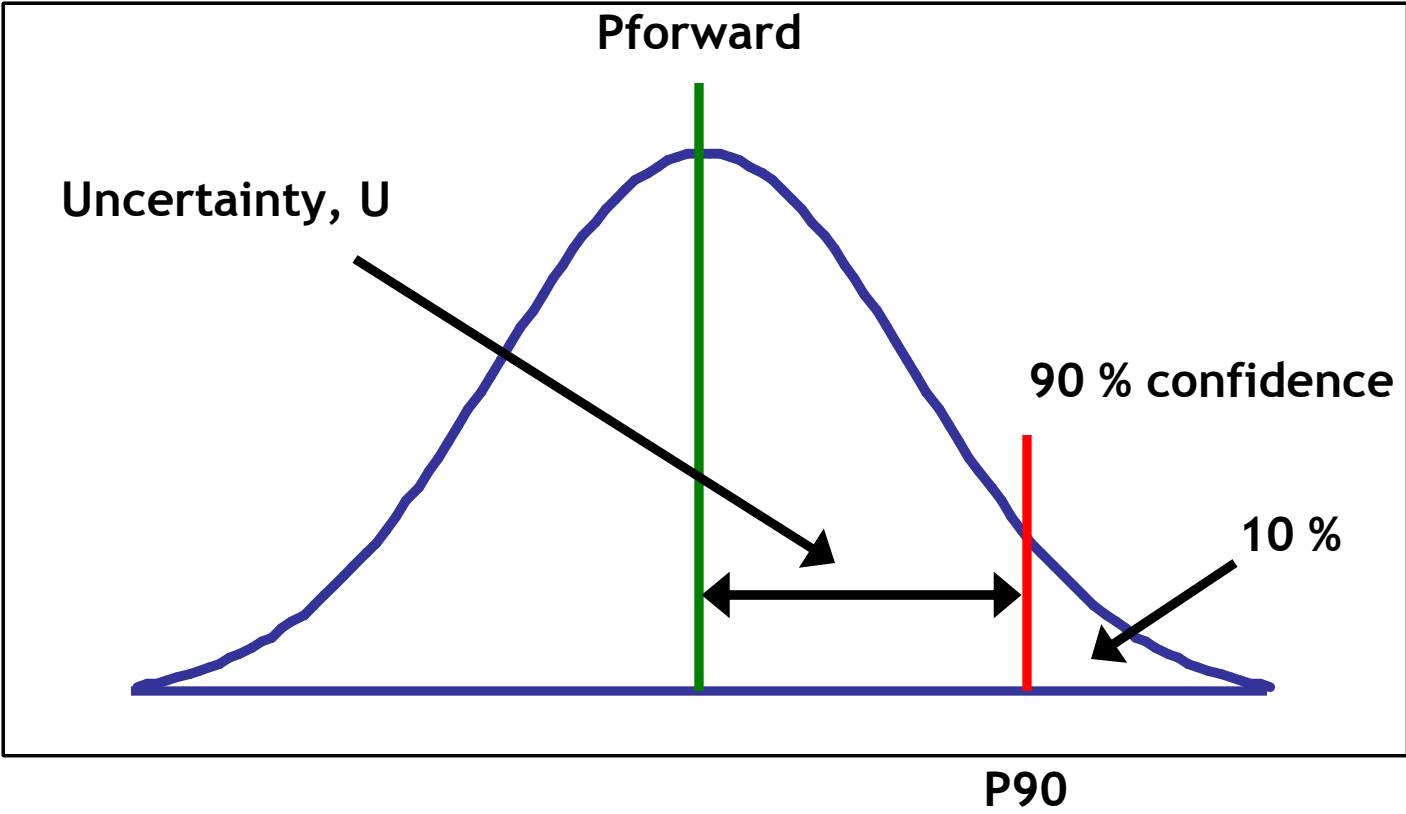
# Electricity Buying Basics

- Don't be a lone wolf
- “Just say NO” to load following deals
- Constant vs. shaped MW quantities
- Decide on risk tolerance and hedge as little as possible
- Price competition
- Flip the coin more than once
- Have the “We’re doing this because ...” discussion before you do anything
  - When the Monday Morning QB shows up ...
  - Outlaw statements that contain phrases such as “Saved/lost \$ X by hedging”
- DO NOT over-hedge

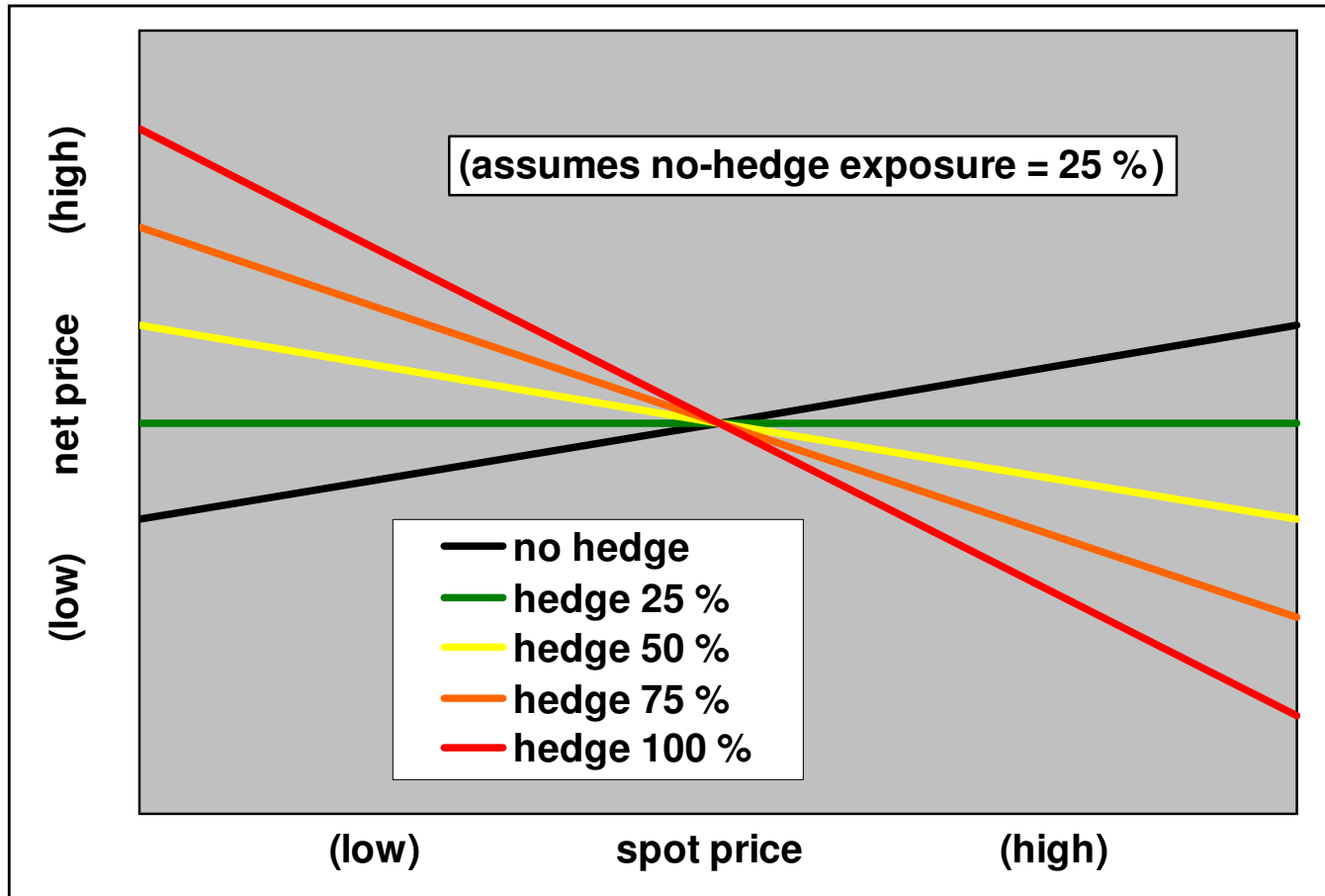
# Effect of Purchase Quantity on Price



# Energy Risk Management in 60 Seconds



# Hedging Outcomes



# Savings Opportunities

- (If you're still on the RPP, GET OFF)
- Commodity procurement is about risk management, not about saving or losing money
- Conservation
- Demand management

# Conservation

- Program delivery:
  - Channel partners
  - Umbrella organizations
  - Local distribution companies (LDCs)
- See [www.everykilowattcounts.com](http://www.everykilowattcounts.com)
- Institutional
  - Building new Toronto facilities - [Better Buildings New Construction Program \(BBNCP\)](#)
  - ERIP - Electricity Retrofit Incentive Program - [link](#)
  - High Performance New Constructions - [link](#)
  - Load Management - [link](#)
  - Retrofitting Toronto facilities - [Better Buildings Partnership \(BBP\)](#)

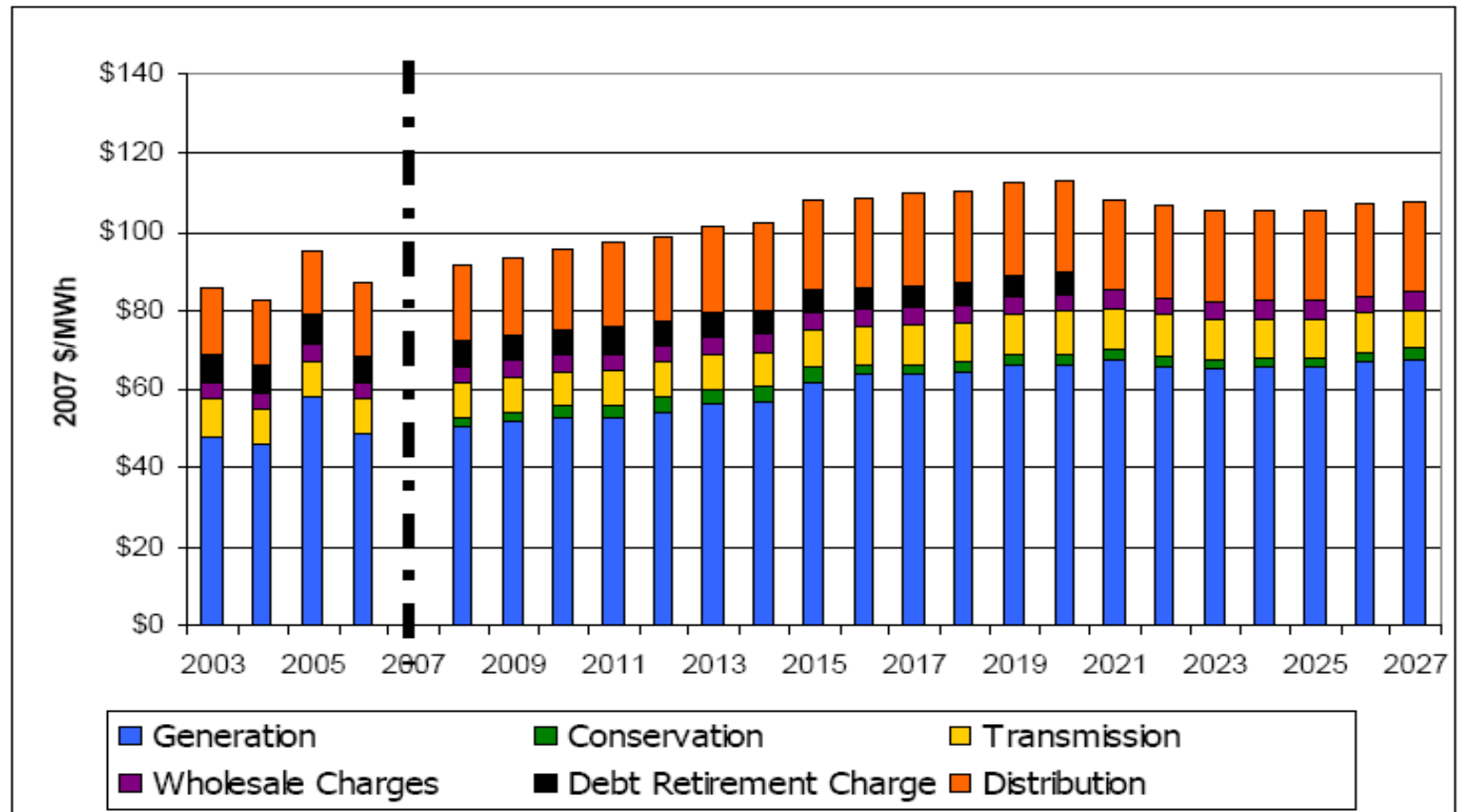
# Demand Management

- Peak shaving
  - Self-administered
  - “Demand Response 3”
- Load shifting
- Consider energy and demand-related impacts
- Be aware that actual energy impacts have been dampened and will continue to increase

# Food For Thought

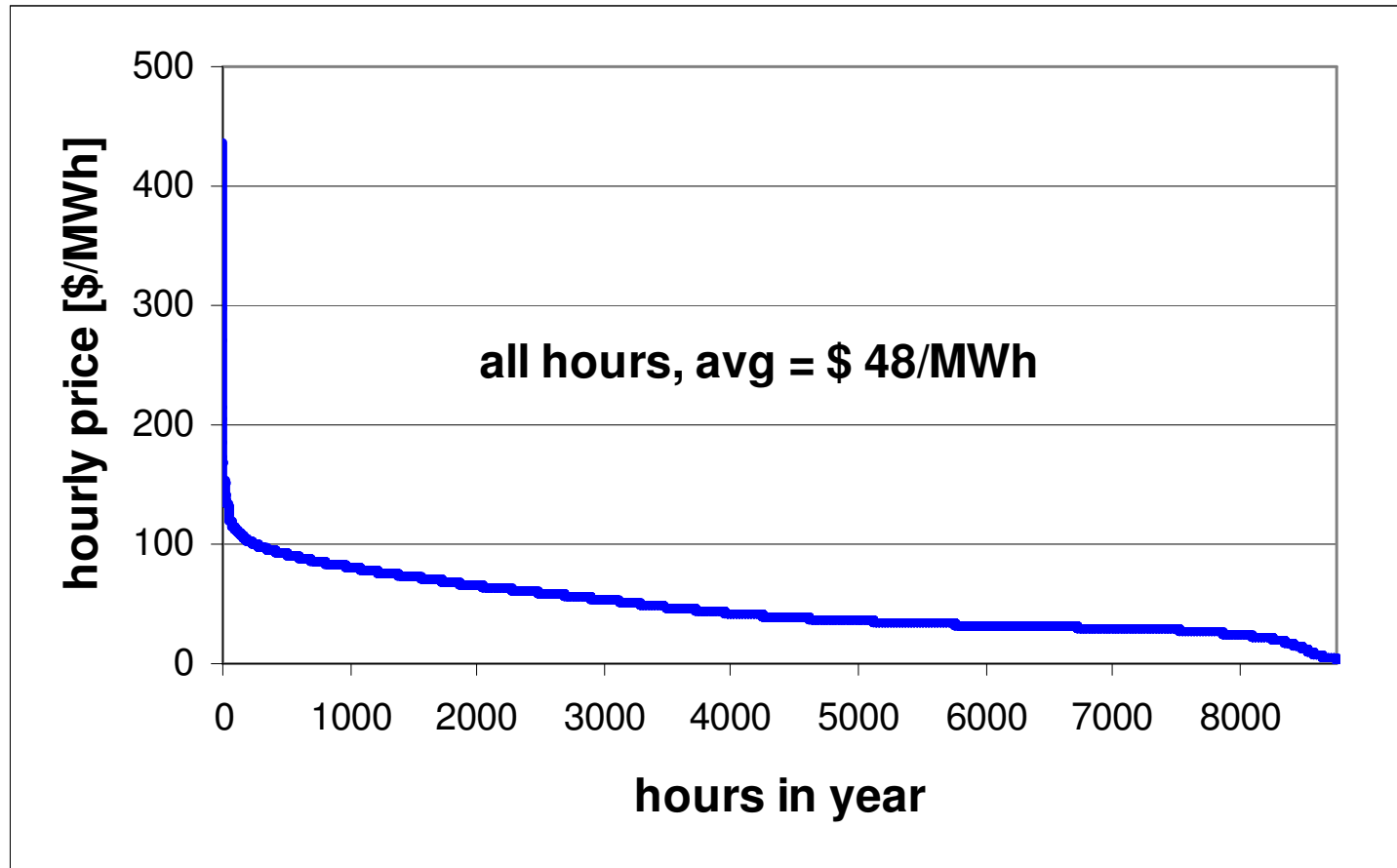
- Price-duration curve
- IT'S YOUR MONEY
- Kill or Be Killed
- Smart Meters
- Coal replacement
- Green power
- Load Serving Entities
- Global Adjustment
- Price risk - natural gas vs. electricity

# Ontario Electricity Consumer

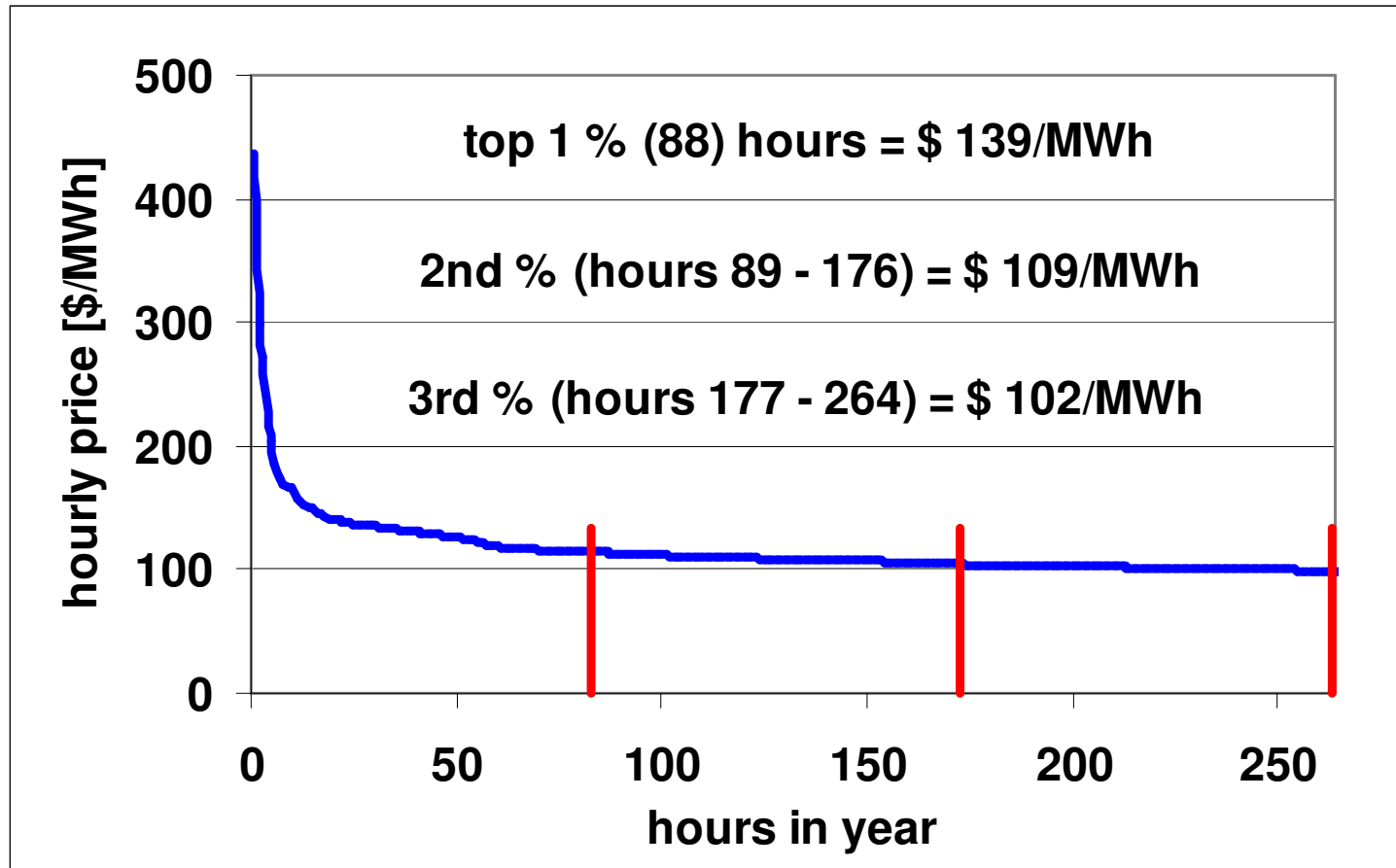


Source: OPA

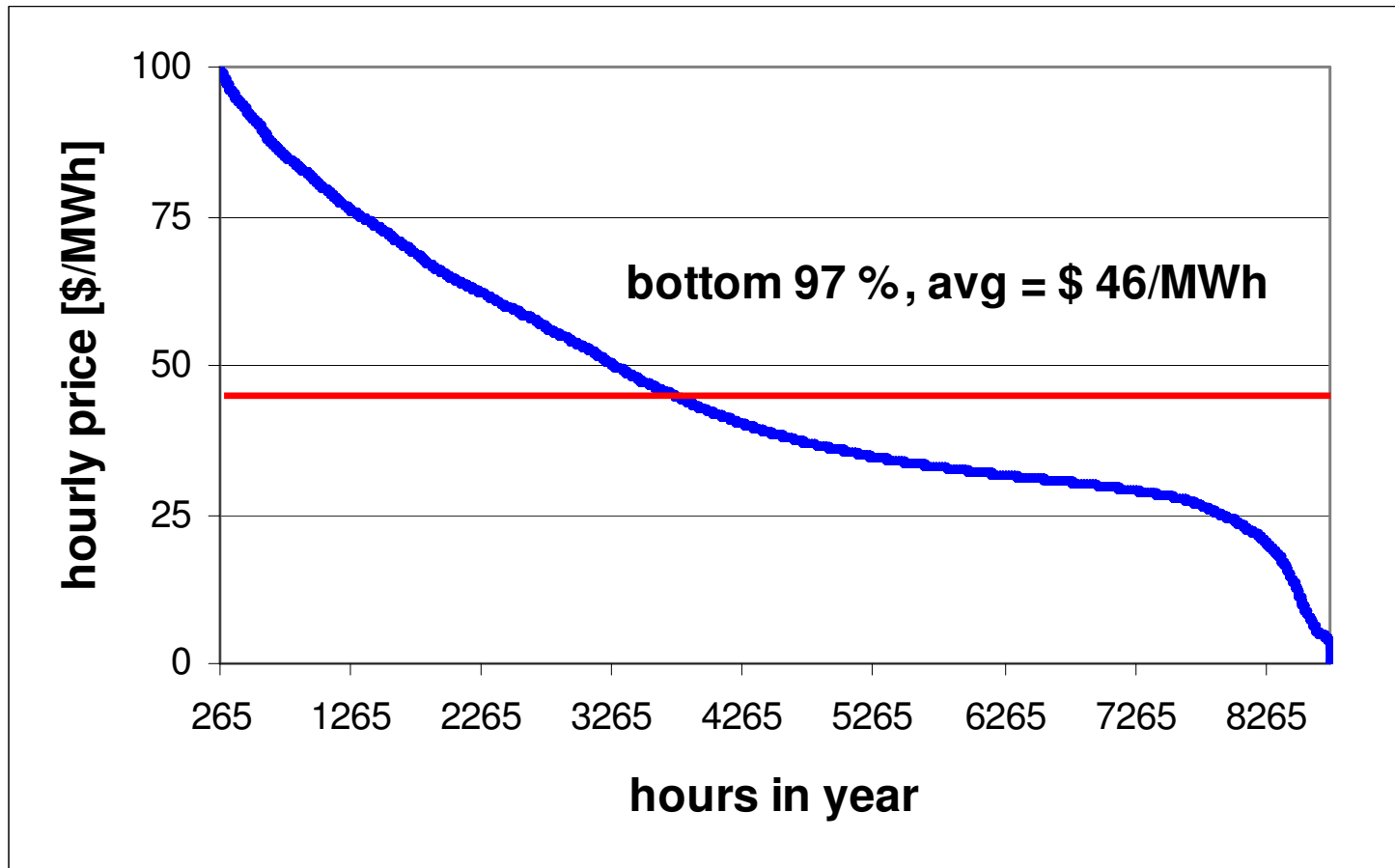
# 2007 Price-Duration Curve - All Hours



# 2007 Price-Duration Curve - Top 3 %



# 2007 Price-Duration Curve - Bottom 97 %



# IT'S YOUR MONEY

	2008	2009	2010	2015
category	\$ million			
energy efficiency	232	262	256	287
dm/cb-large customers	108	112	117	158
dm/cb-others	6	6	6	6
fuel switching	22	27	43	111
total	368	407	422	562
unit cost [\$/MWh]	\$ 2.37	\$ 2.63	\$ 2.72	\$ 3.63

1. included: program and incentive cost types
2. excluded: customer cost types
3. excluded: Combined Heat and Power, Renewable Energy Standard Offer Program categories
4. costs stated in 2007 \$
5. dm/cb=demand management/conservation behaviour
6. unit cost assumes total Ontario energy constant at 155 TWh

# CDM - Killed or Be Killed

- CDM costs borne by all
- Participate, or else
- Short-term non-energy costs are a zero sum game
- Participants' total cost saving will be diluted by a rise in unit costs
- Non-participants will see total cost increase

# Smart Meters

- Implementation = \$ 1.5 - \$ 2.0 billion
- Transition from bill calculated based on NSLS to one calculated based on actual load profile means there will be ...  
winners, losers
- Smart Meter RPP has cross-subsidies
- Savings via ...
  - Waste identification
  - Demand Response programs
  - Load shifting

# Coal Replacement - Bill Impact

source	2008	2015	
	TWh	TWh	2007\$/MWh
non-prescribed hydro	13	13	\$ 43
non-prescribed coal	16	0	\$ 43
prescribed hydro	16	16	\$ 38
Beck tunnel	0	2	\$ 69
prescribed nuclear	47	40	\$ 52
refurbished prescribed nuclear	0	3	\$ 74
Bruce A	11	20	\$ 74
NUGs	11	7	\$ 112
renewed NUGs	0	0	\$ 127
CES contracts, incl. CHP	2	5	\$ 142
RES contracts	2	3	\$ 74
new nuclear	0	0	\$ 86
new renewables	0	5	\$ 85
new gas	0	2	\$ 152
standard offer dispatchable	0	0.5	\$ 95
standard offer	0	0.5	\$ 97
standard offer solar	0	0	\$ 366
uncontracted	29	25	\$ 43
imports	7	4	\$ 55
total	154	146	\$ 62

- Coal at \$ 48/MWh replaced by sources with weighted price of \$ 93/MWh
- Impacts ~ 10 % of bill
- Increase ~ \$ 4.50/MWh
- Will also see spot price increase as prices will now be set primarily by gas-fired generation (mitigated by other mechanisms)

# Coal Replacement - Implied Carbon Cost

	heat rate	CO2 emitted	tonnes/MWh	
	MMBtu/MWh	lb/MMBtu	direct	saved vs. coal
coal	varies	varies	0.997	0.000
SCGT	9.5	113	0.487	0.510
CCGT	7.0	113	0.359	0.638
hydro/Beck, nuclear, renewables	---	---	0.000	0.997

coal	prices, \$/MWh		implied carbon cost, \$/tonne			
	\$ 48	premium	SCGT	CCGT	hydro/Beck, nuclear	renewables
replacement	\$ 75	\$ 27	\$ 53	\$ 42	<b>\$ 27</b>	\$ 27
	\$ 100	\$ 52	\$ 102	\$ 82	\$ 52	<b>\$ 52</b>
	\$ 125	\$ 77	\$ 151	\$ 121	\$ 77	\$ 77
	\$ 150	\$ 102	\$ 200	\$ 160	\$ 102	\$ 102
	\$ 175	\$ 127	\$ 249	<b>\$ 199</b>	\$ 127	\$ 127
	\$ 200	\$ 152	<b>\$ 298</b>	<b>\$ 238</b>	\$ 152	\$ 152

# Green Power - Vintages ...

... or not ?

“I bought Ecologo-certified green power,  
my job is done.”

Question: What did you buy - grape juice, Baby Duck  
or a decent French wine ?

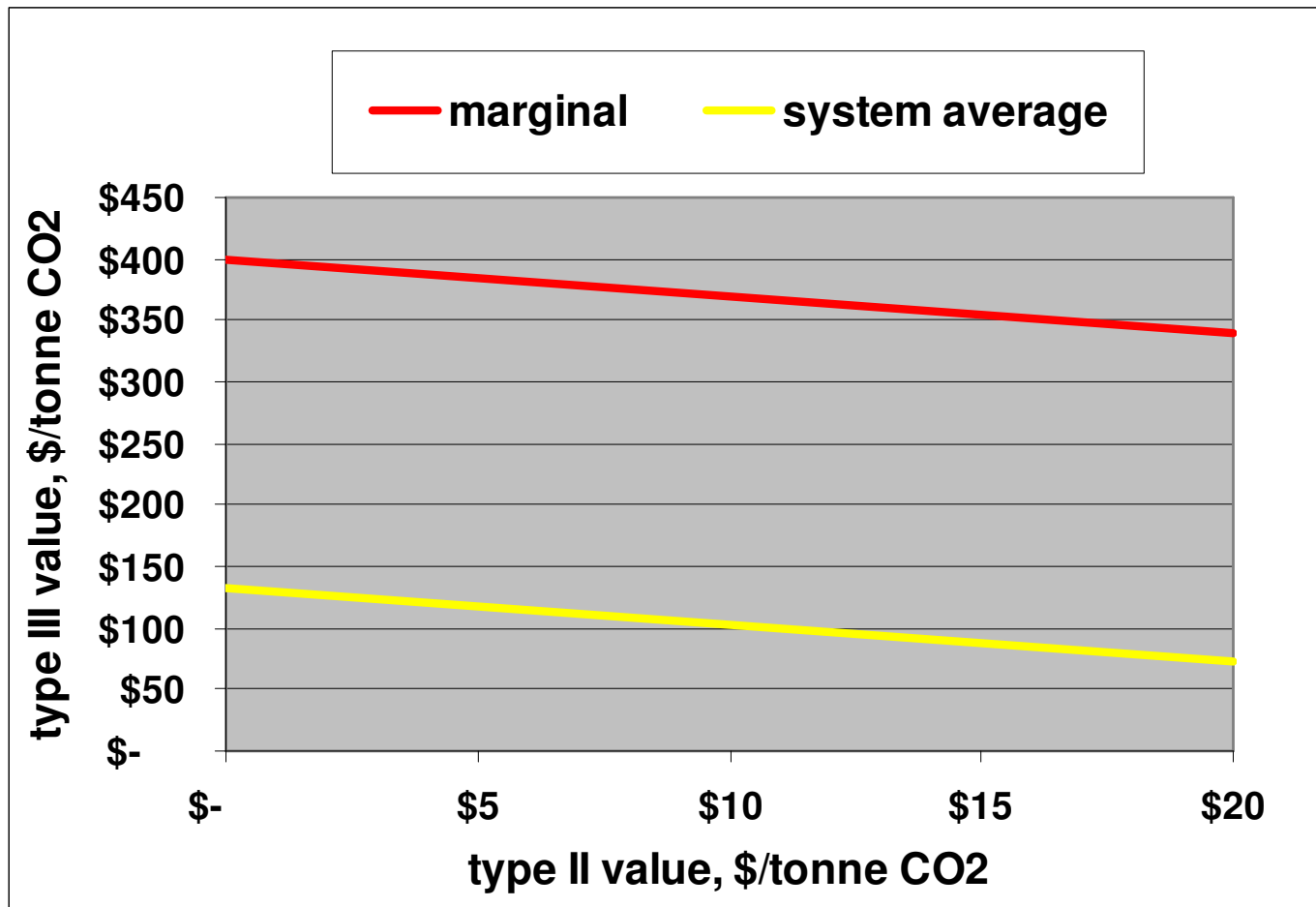
Ecologo types (renewable low-impact):

- I - prior to 1991
- II - January 1991 - March 2001
- III - April 2001 onward

# Green Power - Implied Carbon Cost

- Assumptions:
  - Purchase product comprised of 75 % type II, 25 % type III
  - Pay total premium of \$ 25/MWh
  - From carbon value perspective, Type II is worth \$ 0 - \$ 20 / tonne
  - Use “displaces” generation that would otherwise produce either 0.25 tonnes/MWh (system average basis) or 0.75 tonnes/MWh (marginal basis) of CO<sub>2</sub>

# Green Power - Implied Carbon Cost



# Load Serving Entities

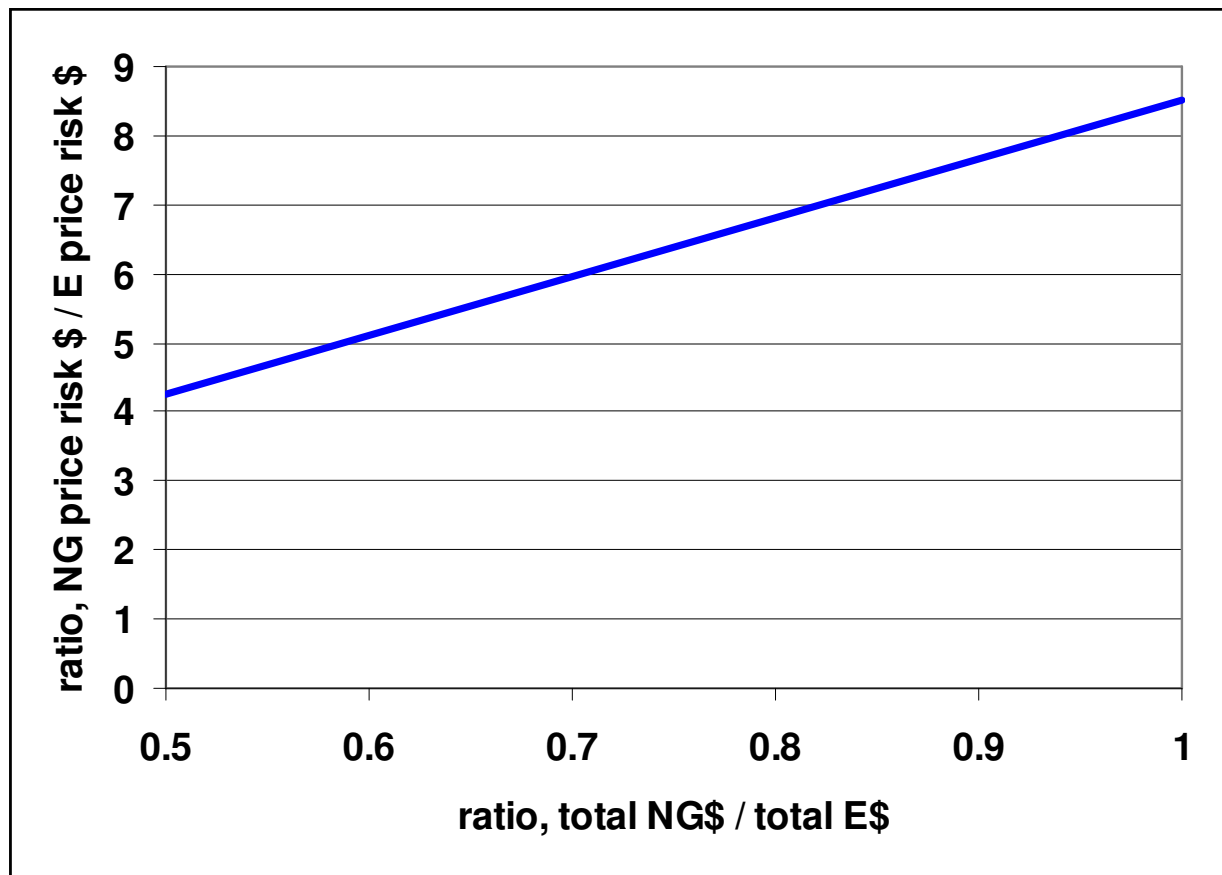
- New name = Customer Entitlement Agents
- Reason for name change ?
- Meant to ...
  - Provide price certainty, stability
  - Foster forward market, lower prices
  - Facilitate demand response
  - Mitigate risk
- Would finish the job (sorry Genie)
- A happy by-product - reduction in residential marketing business ?

# Change to Global Adjustment ?

- Currently, total impact smeared across all consumption
- Looking at ways to allocate costs/benefits to those that cause/create them
- Winners: industrials
- Losers: others

# \$ Price Risk

## - Natural Gas vs. Electricity



# \$ Price Risk

## - Natural Gas vs. Electricity

- When unhedged in electricity and natural gas...
  - Commercial customer with  $\$NG/\$E = 0.5$ , natural gas price risk in dollars is over 4 x as high as with electricity
  - Industrial customer with  $\$NG/\$E = 1.0$ , natural gas price risk in dollars is over 8 x as high as with electricity

# Summary

- Conventional RPP cross-subsidy bad for larger customers
- Smart Meter RPP cross-subsidy bad for “peaky” customers
- Significant “market coverage” reduces risk
- Don’t over-hedge
- Savings from CDM
- Things to be aware of, consider



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