



## SHINING A LIGHT ON ONTARIO ELECTRICITY ISSUES

Power Management in Ontario  
May 12, 2009

Bruce Sharp, P. Eng.  
Senior Consultant

Aagent Energy Advisors Inc.

[bsharp@aagent.ca](mailto:bsharp@aagent.ca) / 416.622.9449.112

  
**Aagent**  
ENERGY ADVISORS INC.

# Agenda

1. A bit about Aagent Energy Advisors
2. Green Energy Act
3. Coal phase-out
4. Global Adjustment
5. Spot price exposure and risk management
6. Price volatility
7. FIT and Retail Green Power
8. Final comments
9. Discuss among yourselves

# Green Energy Act - In a Nutshell

- Good politics
- Questionable policy
- “Reverse Reganism”
- Supporters abound
- Critics do so at own risk
- Shocking (or not) lack of quantitative information
- OEB to be cheerleaders in some areas
- Beginning of the (final) end for the Ontario electricity “market”

# Green Energy Act - Hidden Math

- GEA will “cause consumers’ cost of electricity to go up by just 1%”
  - Smart grid: each \$1 billion adds \$0.48/MWh or 0.46%; total cost = \$3 billion +
  - 5,000 MW of incremental wind capacity could increase cost by \$7.00 - \$8.75/MWh or 6.5 - 8.5%
  - Admission that unit prices will go up, but will be mostly offset by conservation
- 50,000 new “green” jobs
  - Spanish study suggests 2.2 jobs lost for each “green” job added (at extremely high cost)

# Green Energy Act

## - Cost of Additional Wind

- Basis = 1,000 MW
- Assumptions:
  - On-shore = 90%, off-shore = 10%; capacity factor = 30.7 %
  - Blended FIT price = \$140.50/MWh
  - Reference spot price = \$65.00/MWh
  - Resulting premium = \$75.50/MWh
  - Ontario energy = 145 TWh
  - Natural gas generation contingent support payment = \$10,000/MW/mth
  - Transmission/distribution annual revenue requirement = \$69,000/\$million rate base

# Green Energy Act

## - Cost of Additional Wind

- Incremental Global Adjustment charge (\$/MWh), per 1,000 MW installed wind capacity

NG back-up required	additional tx/dx required, \$/MW				
	%	\$ -	\$ 100,000	\$ 200,000	\$ 300,000
0%	\$ 1.40	\$ 1.45	\$ 1.50	\$ 1.54	\$ 1.59
5%	\$ 1.44	\$ 1.49	\$ 1.54	\$ 1.58	\$ 1.63
10%	\$ 1.48	\$ 1.53	\$ 1.58	\$ 1.63	\$ 1.67
15%	\$ 1.52	\$ 1.57	\$ 1.62	\$ 1.67	\$ 1.71
20%	\$ 1.57	\$ 1.61	\$ 1.66	\$ 1.71	\$ 1.76

# Coal Phase-Out - Unfortunate “See Your Bid”

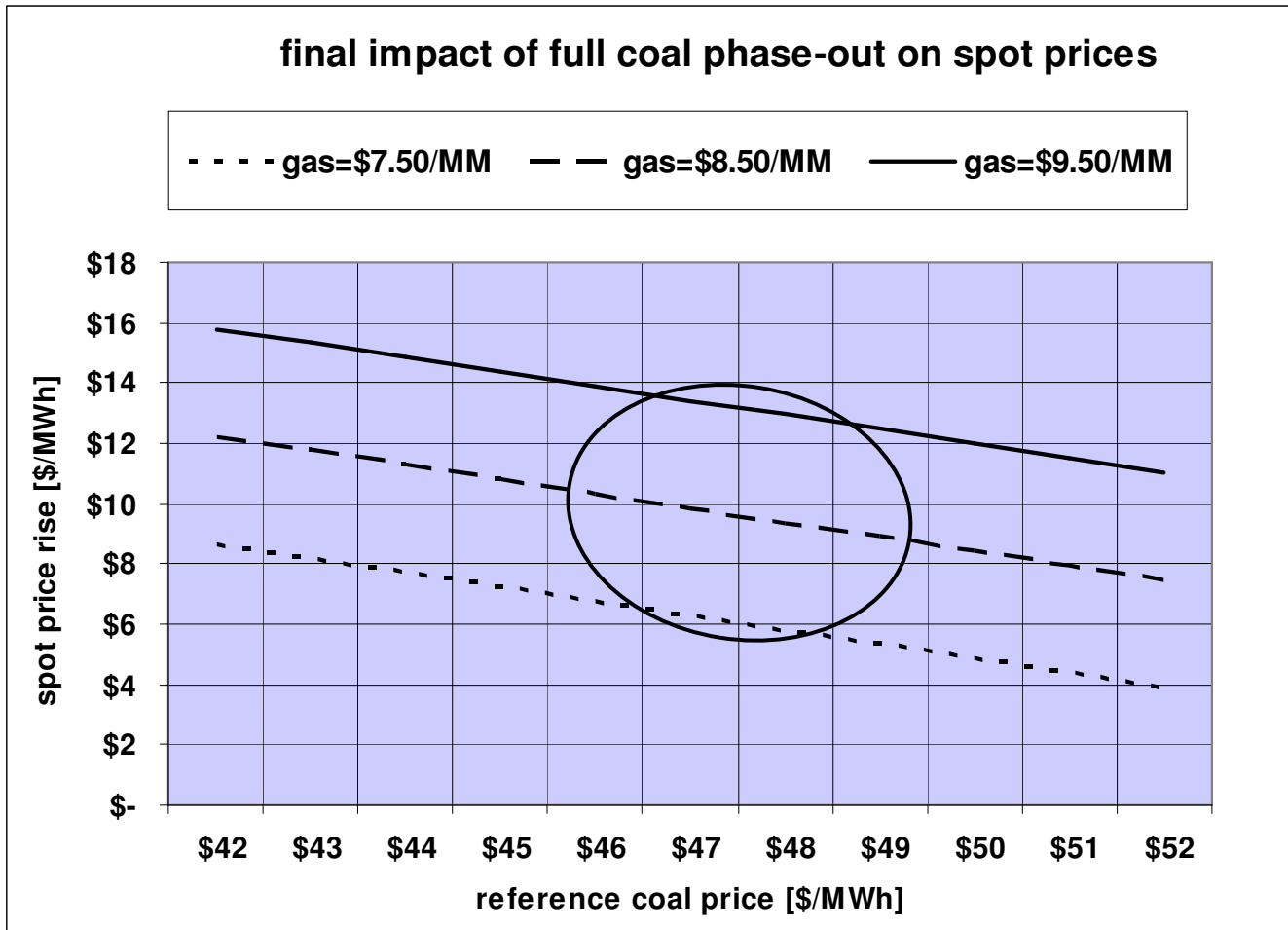
- Origin: 2003 provincial campaign
- Need to go from A to B
- Coal phase-out dictates route, transport
- Costs completely obfuscated

# Coal Phase-Out - Spot Market Increase

- Price-setting share assumptions:

	coal	oil/gas	hydro
2008	60%	15%	25%
2015, OPA IPSP	0%	45%	55%
2015, bullish	0%	55%	45%
2015, mid-point	0%	50%	50%
change, mid-point	-60%	35%	25%

# Coal Phase-Out - Spot Market Increase



# Coal Phase-Out - Global Adjustment Increase

- Replace 6,457 of coal capacity with natural gas-fired generation
- By 2015, new natural gas generation will have Contingent Support Payments ~ \$10,000/MW/month
- Total annual payment = \$775 million
- Global Adjustment impact = \$5.34/MWh = 5.1%

# Coal Phase-Out - Implied Carbon Price

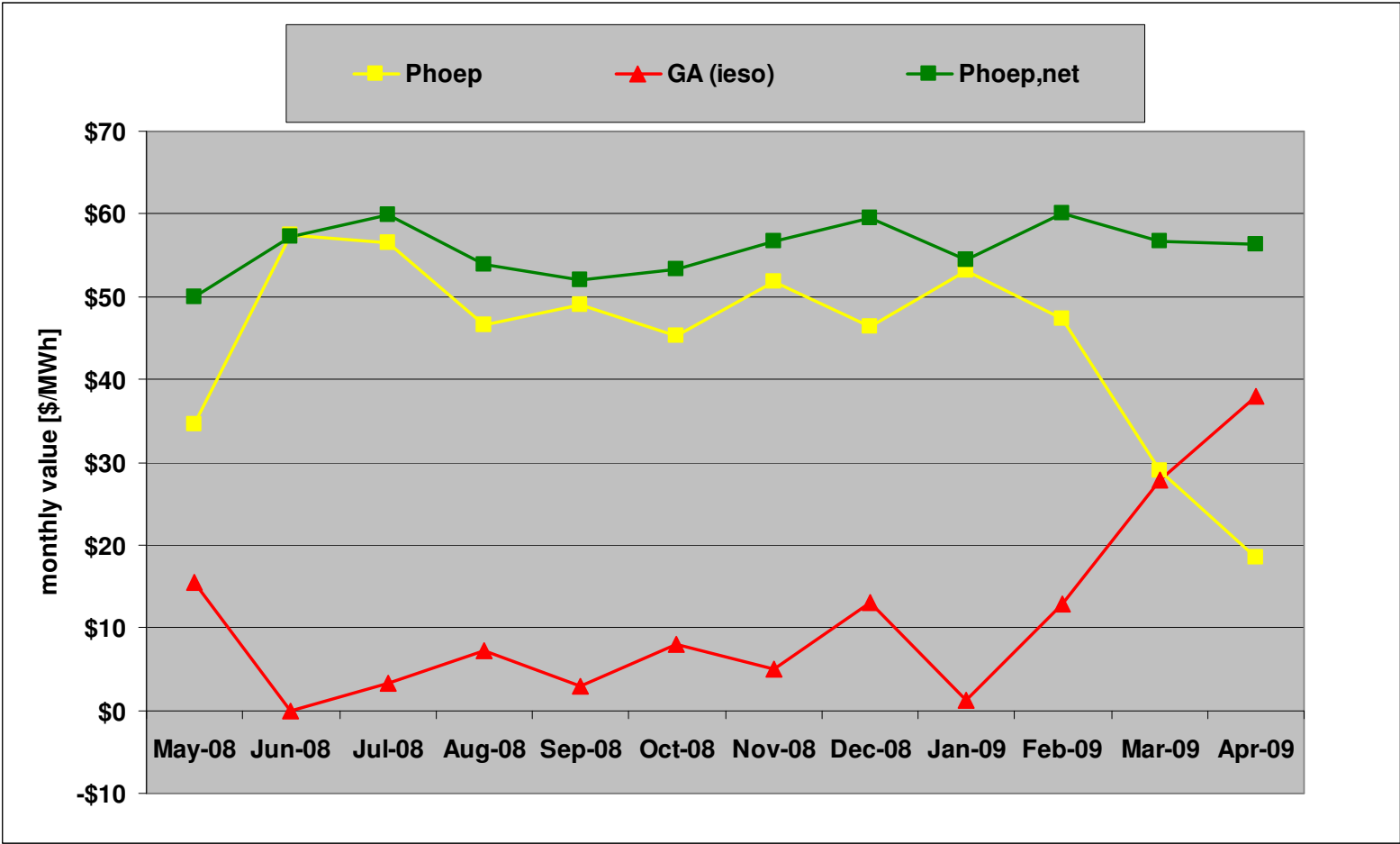
- 2008 = 23.2 TWh -> 2015 = zero
- Replace with natural gas output
  - Contingent Support Payments = \$ 775 million per year
  - Marginal energy cost = \$73/MWh (heat rate = 8 MMBtu/MWh, fuel = \$8.75/MMBtu, mtce ~ \$ 3/MWh)
  - Total cost = \$106/MWh
- Compare against coal at \$50/MWh
- Reduce specific carbon output from ~ 1 tonne/MWh to ~ 0.41 tonne/MWh
- Implied carbon price = \$96/tonne

# Global Adjustment

## - Ontario Energy Market's "Bad Bank"

- Unfortunate irony in LDC name: Provincial Benefit
- 2008 dollar amounts:
  - Non-utility-generators = \$480 million (charge)
  - Ontario Power Generation = - \$190 million (credit)
  - Ontario Power Authority = \$ 612 million (charge)
  - Total = \$901 million (charge)
- 2008 unit price = \$6.12/MWh, resulting in GA-inclusive net energy price of \$51.90/MWh
- OPG: higher prices means it will be a debit
- OPA: more CDM, natural gas, renewables - only one way to go

# Global Adjustment - Impact on Net Price

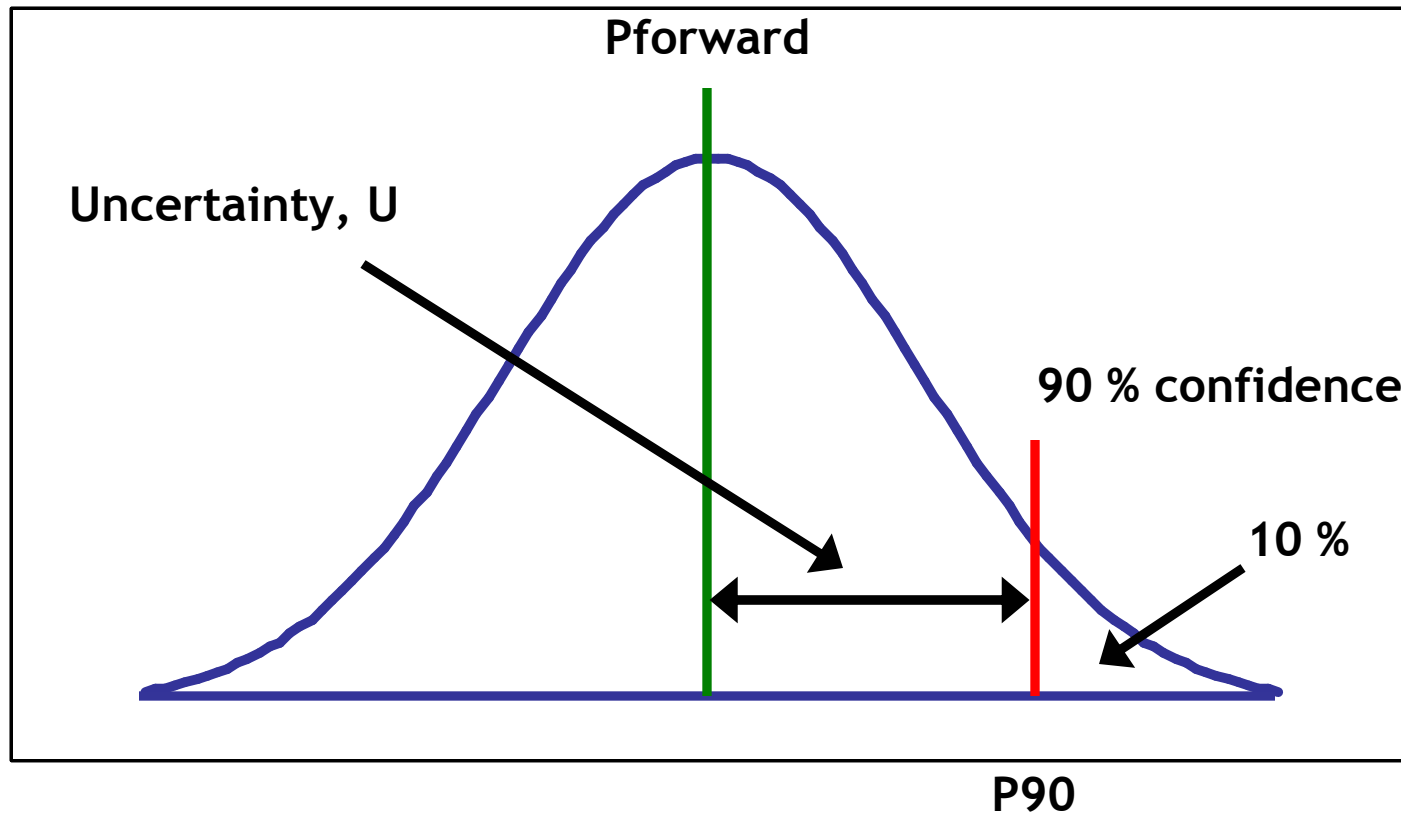


# Global Adjustment - Possible Future Split

- Postage-stamp allocation of GA dollars is uniform but not necessarily fair
- Industrials (particularly those with flexible loads) would like to see different allocation
- Allocate new natural gas and CDM to on-peak hours
  - Feb09 example (\$/MWh):

current (postage stamp)	\$ 12.83
on-peak	\$ 21.08
off-peak	\$ 4.50
flat load	\$ 12.00
Toronto NSLS	\$ 13.12

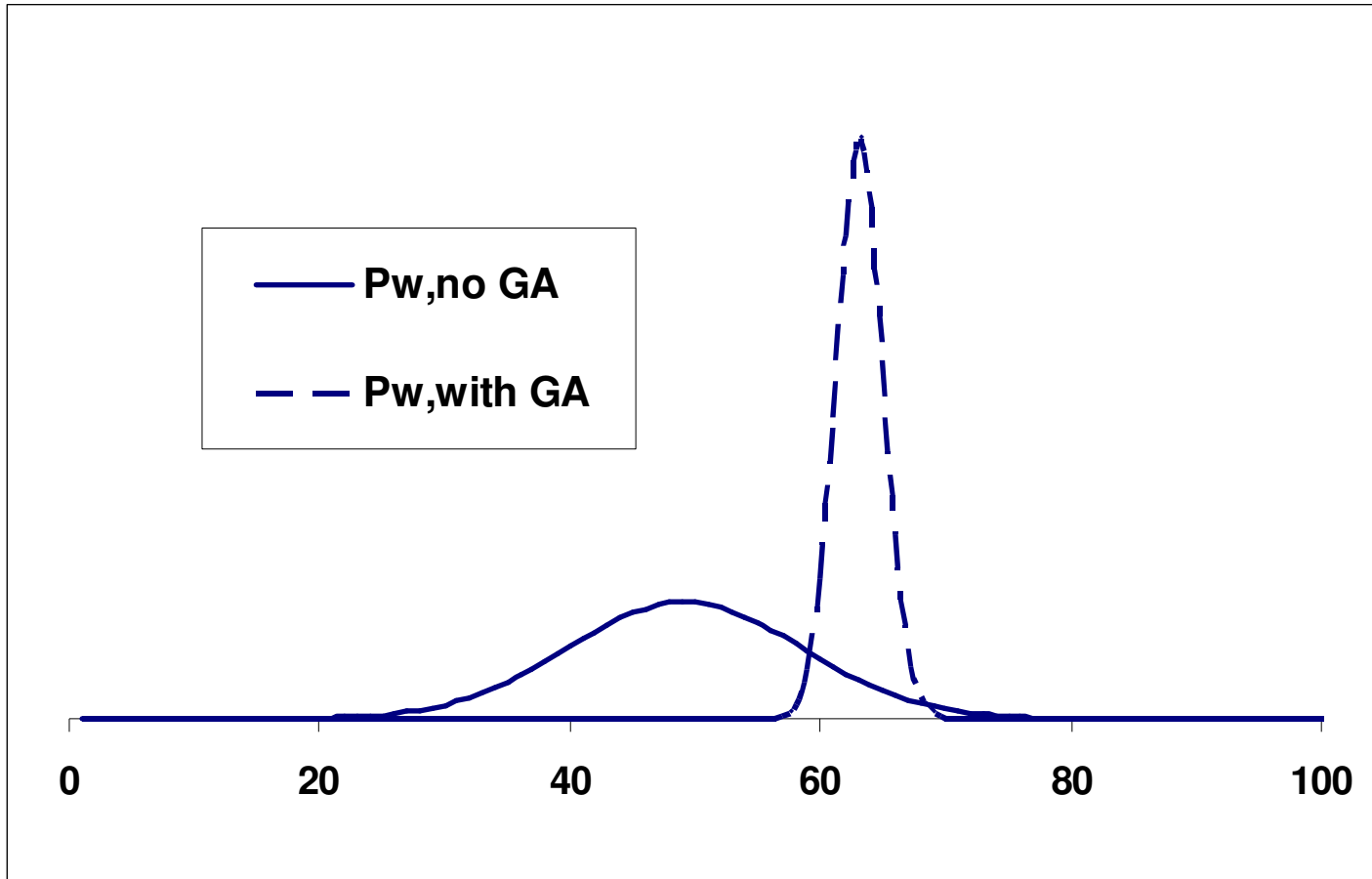
# Risk Management - Hedging



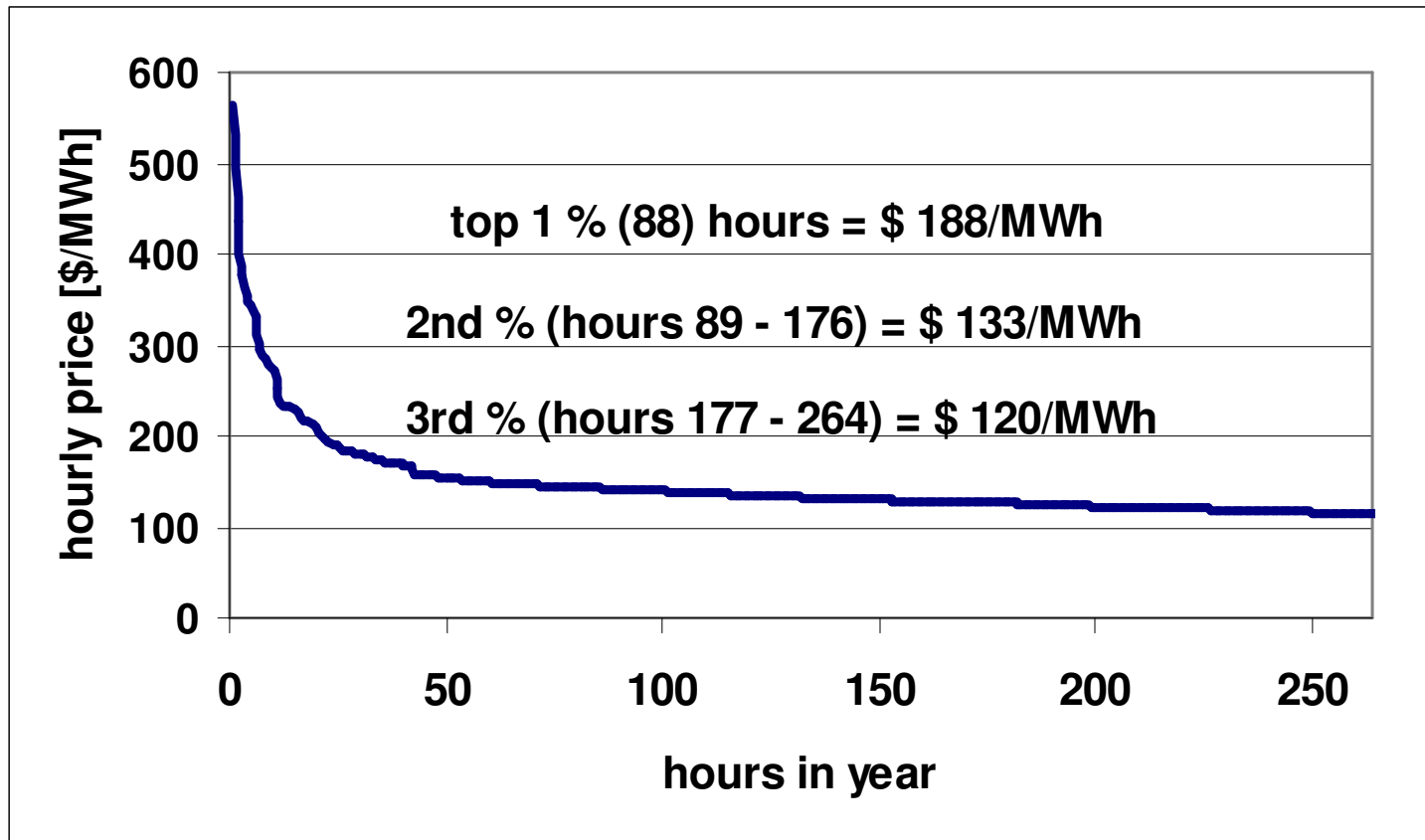
# Risk Management - Spot Market Exposure

- Contracts falling under Global Adjustment:
  - End of 2009 ~ 20,000 MW providing 16,000 MW of potential coverage
  - End of 2010 ~ 24,000 MW providing 19,000 MW of potential coverage
- Exposure relative to HOEP(based on modeling of GA as a function of Png,Phoep,Pon-peak):
  - Nov08-Apr09 ~ 14%
  - By end of 2009 ~ 13%
  - By end of 2010 ~ 6%
- Industrial customer risk management policy: “We’re done.”

# Risk Management - GA Impact



# Price Volatility - 2008 Price-Duration Curve



Phoep = \$ 48.83/MWh; price for lowest 97 % = \$ 45.78/MWh

# FIT and Retail Green Power

- Previous, modest RESOP goal of 1,000 MW met in 18 months vs. 10-year plan
- Feed-in-Tariff prices attractive
- How can electricity retailers selling green power compete with FIT prices and 20-year contracts ?

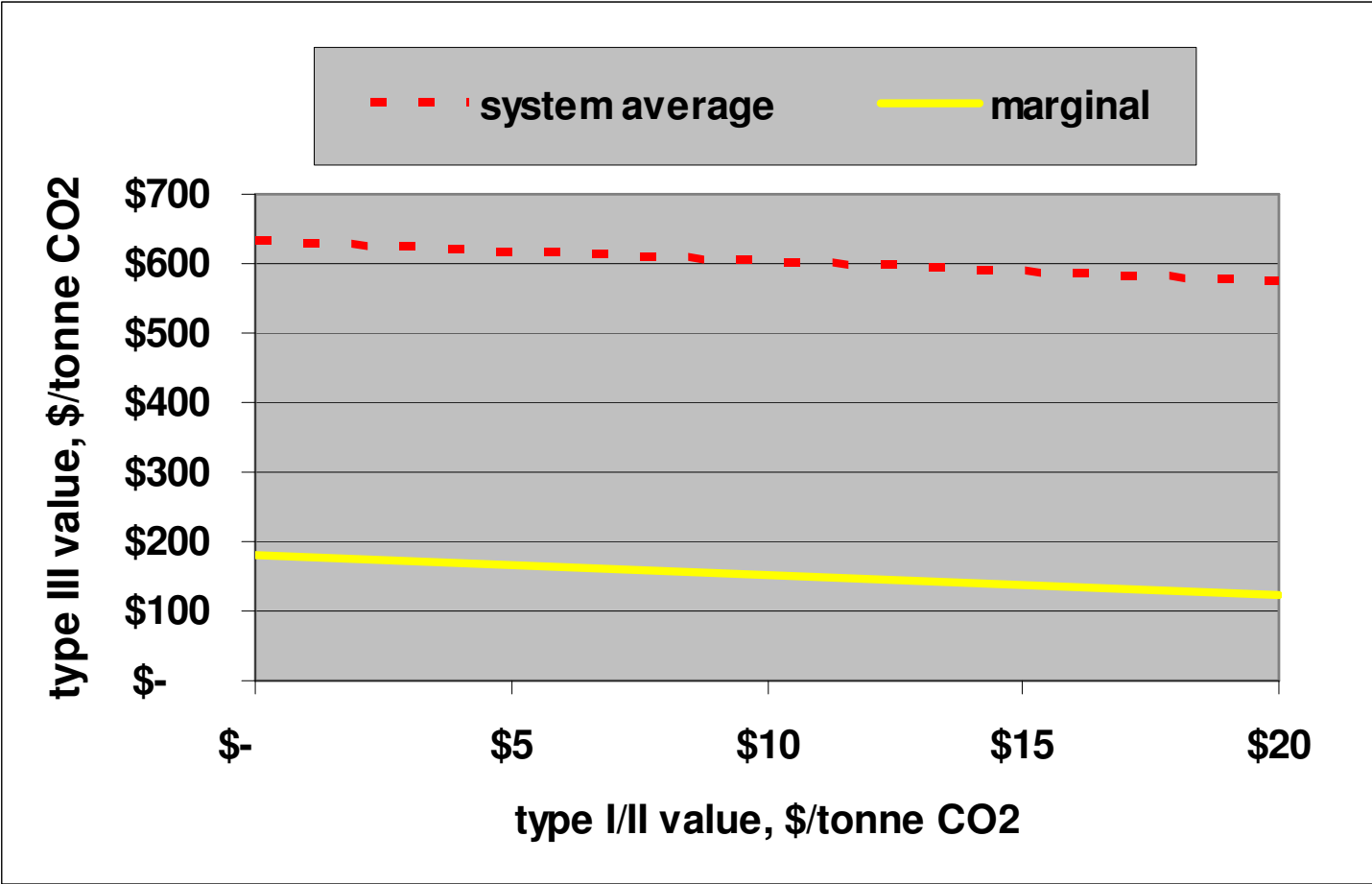
# Retail Green Power - Competing With FIT

premium paid	\$ 30	
profit	\$ 15	
available to pay generator	\$ 15	
FIT (wind, on-shore)	\$ 135	
underlying HOEP	\$ 60	
FIT premium	\$ 75	
type I/II premium	\$ 5	88%
premium to new generator	\$ 90	12%
total	\$ 15	100%

# Retail Green Power - Implied Carbon Cost

- Assumptions:
  - Purchase product comprised of:
    - Type I (before 1991) or Type II (Jan91 - Mar01) = 80%
    - Type III (Apr01 and later) = 20%
  - Pay total premium of \$30/MWh
  - From carbon value perspective, Type I/II is worth \$0 - \$20 / tonne
  - Emissions factors (2008, tonnes CO<sub>2</sub>/MWh):
    - Average = 0.19
    - Marginal (coal + oil/natural gas) = 0.66

# Retail Green Power - Implied Carbon Cost



# Final Comments

- Green Energy Act - it's all good, until the bill arrives
- Coal phase-out - costly ideology
- Global Adjustment - dumping ground for expensive deals
- Spot price exposure and risk management - you are not in control; higher price, less risk
- Price volatility - a big yawn; future shelf will be well-stocked
- Retail Green Power - paying a lot for plonk

# Discuss Among Yourselves

- Ontario residential retail electricity market  
- why ?
- CDM - will you “kill or be killed” ?
- Smart Meters / Grid - real or hoax ?
- OPA - do they have a credible exit strategy ?
- Climate change - carrots and/or sticks ?



## SHINING A LIGHT ON ONTARIO ELECTRICITY ISSUES

Power Management in Ontario  
May 12, 2009

Bruce Sharp, P. Eng.  
Senior Consultant

Aagent Energy Advisors Inc.

[bsharp@aagent.ca](mailto:bsharp@aagent.ca) / 416.622.9449.112

  
**Aagent**  
ENERGY ADVISORS INC.