



Alberta's Electricity Market: Design, Structure and Key Considerations

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What does the Market Surveillance Administrator do?

- Investigation
- Enforcement
- Compliance with rule and reliability standards
- Market monitoring
- Guidelines
- State of the Market Reports: Assessment of competition



Today's topics

- Very quick guide to participating in the Alberta Electricity Market
- Focus on utility scale participation
- Understanding competitive forces in the market
- How to find out more



Alberta Electricity Market

- “Energy-only”
- Wholesale market participants get paid based on hourly prices for generation or providing operating reserves.
- Hourly prices can be quite volatile reflecting availability of supply and competitive dynamics.
- Forward markets for electric energy exist but trading multiples are low.
- Long term sales of power uncommon.



Finding out more...

Basic information:

Alberta Wholesale Market: A description of basic structural features

<http://albertamsa.ca/uploads/pdf/Archive/2012/SOTM%20Basic%20Structure%2083012.pdf>

Understanding Competition / Price Volatility:

State of the Market Report 2012

<http://albertamsa.ca/uploads/pdf/Archive/2012/SOTM%20Basic%20Structure%2083012.pdf>

Generation Investment:

Investor Perspectives on the Attractiveness of Alberta's Electricity Generation Market

<http://albertamsa.ca/uploads/pdf/Archive/2012/Investor%20Perspectives%20Report%20to%20MSA%20-%202017%20Augus.pdf>

Connecting and Participating in the Market:

See www.aeso.ca



What does hourly pricing mean for solar?

- Market prices tend to be lower when demand is lower. E.g. night
- Market prices tend to be lower when lots of supply is available. E.g. when its windy in southern Alberta.
- If you have an estimated production profile for a solar generator in Alberta it is easy to show they would have received a much higher average price when they are running than some other technologies.
- Recognize large scale solar investment will have consequences for competition.



An example

- Using PVWatts (<http://pvwatts.nrel.gov/>) can generate a production profile for an example solar generator.
- Assumptions:

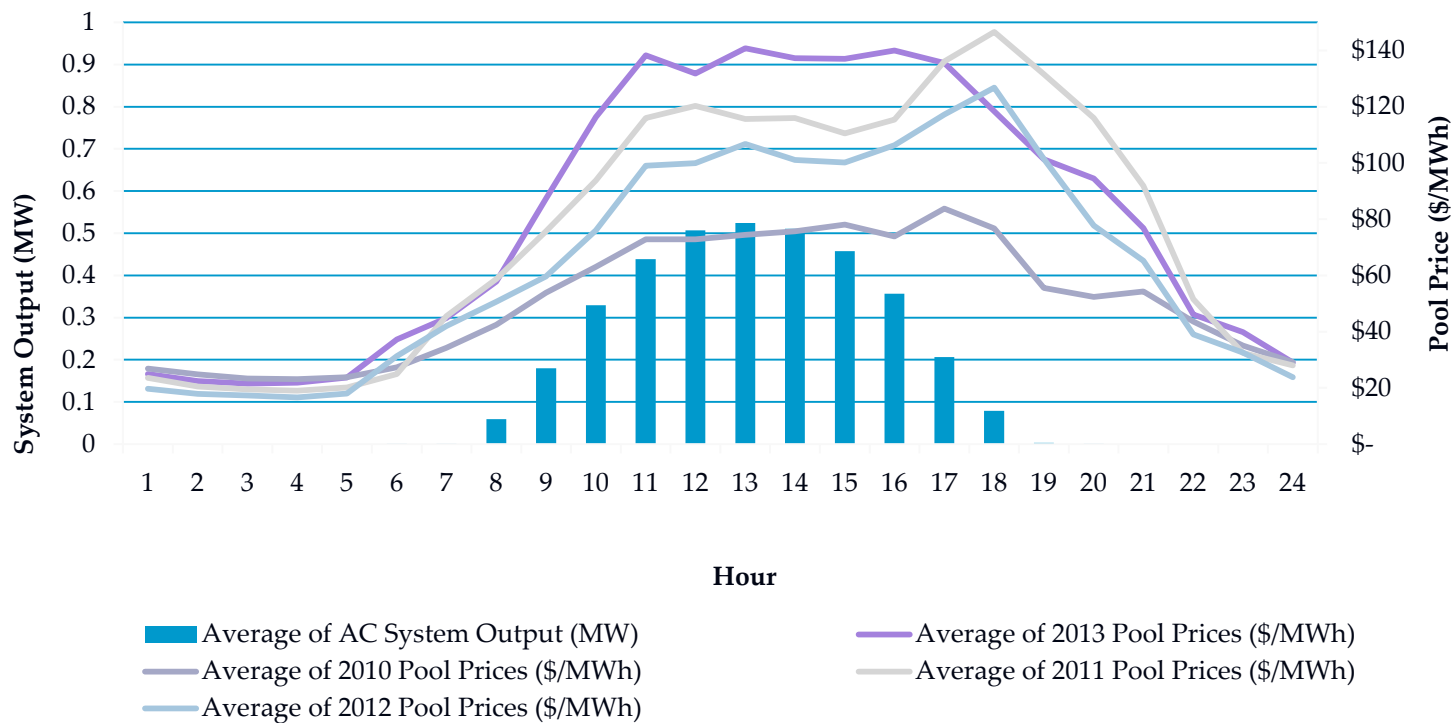
City:	Calgary
Lat (deg N):	51.12
Long (deg W):	114.02
Elev (m):	1077
Array Type:	Fixed (open rack)
Array Tilt (deg):	51.1
Array Azimuth (deg):	180
DC Rating (kW):	1000
DC to AC Derate Factor:	0.77

Note: PVwatts was updated on September 8, 2014 these numbers are from the previous version

- From that we get an hourly production profile we can compare to historical hourly pool prices in Alberta.



Hourly Averages

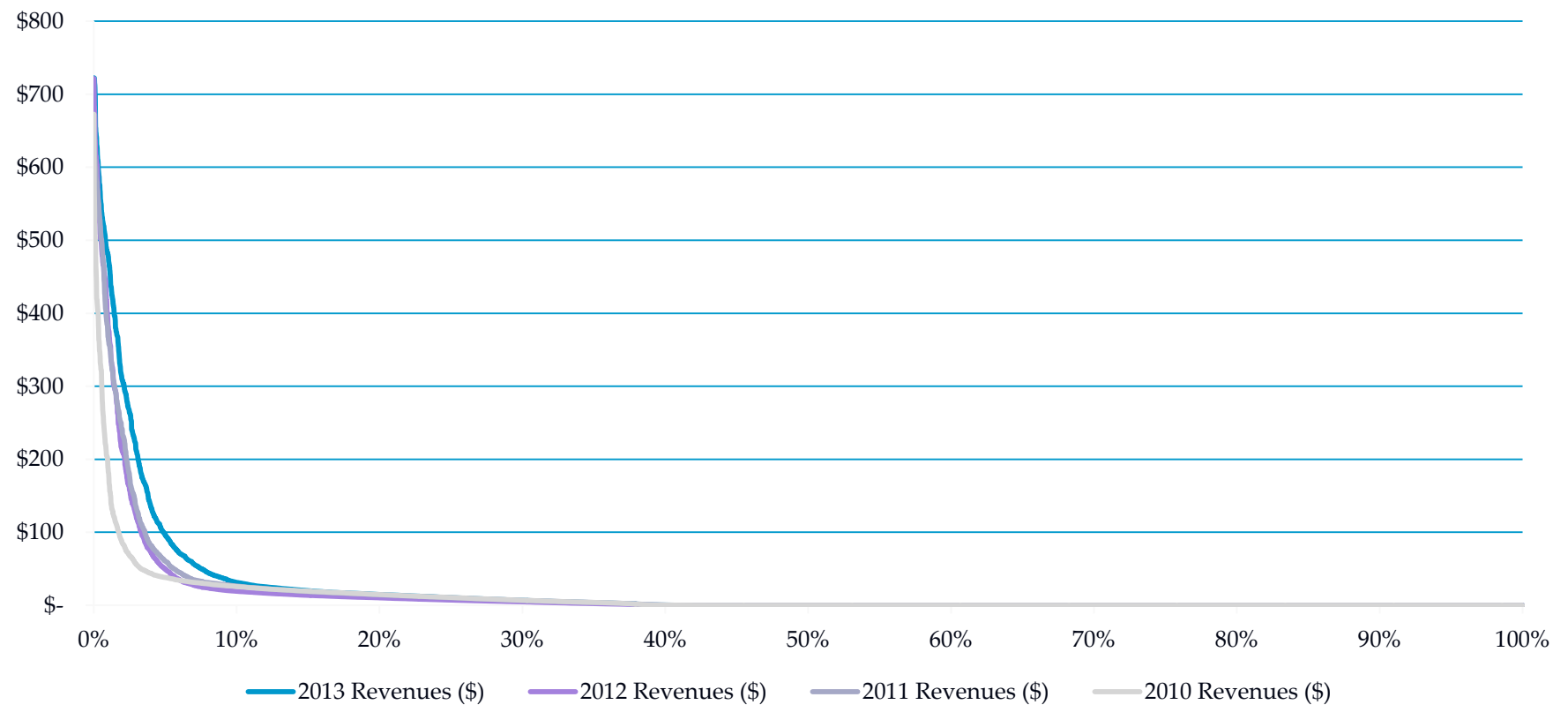


	2010	2011	2012	2013
Average pool price (\$/MWh)	50.89	76.22	64.42	80.19
Total Revenue (\$)	96,970	146,359	131,300	186,167
Average Revenue (\$)	72.77	109.83	98.53	139.70



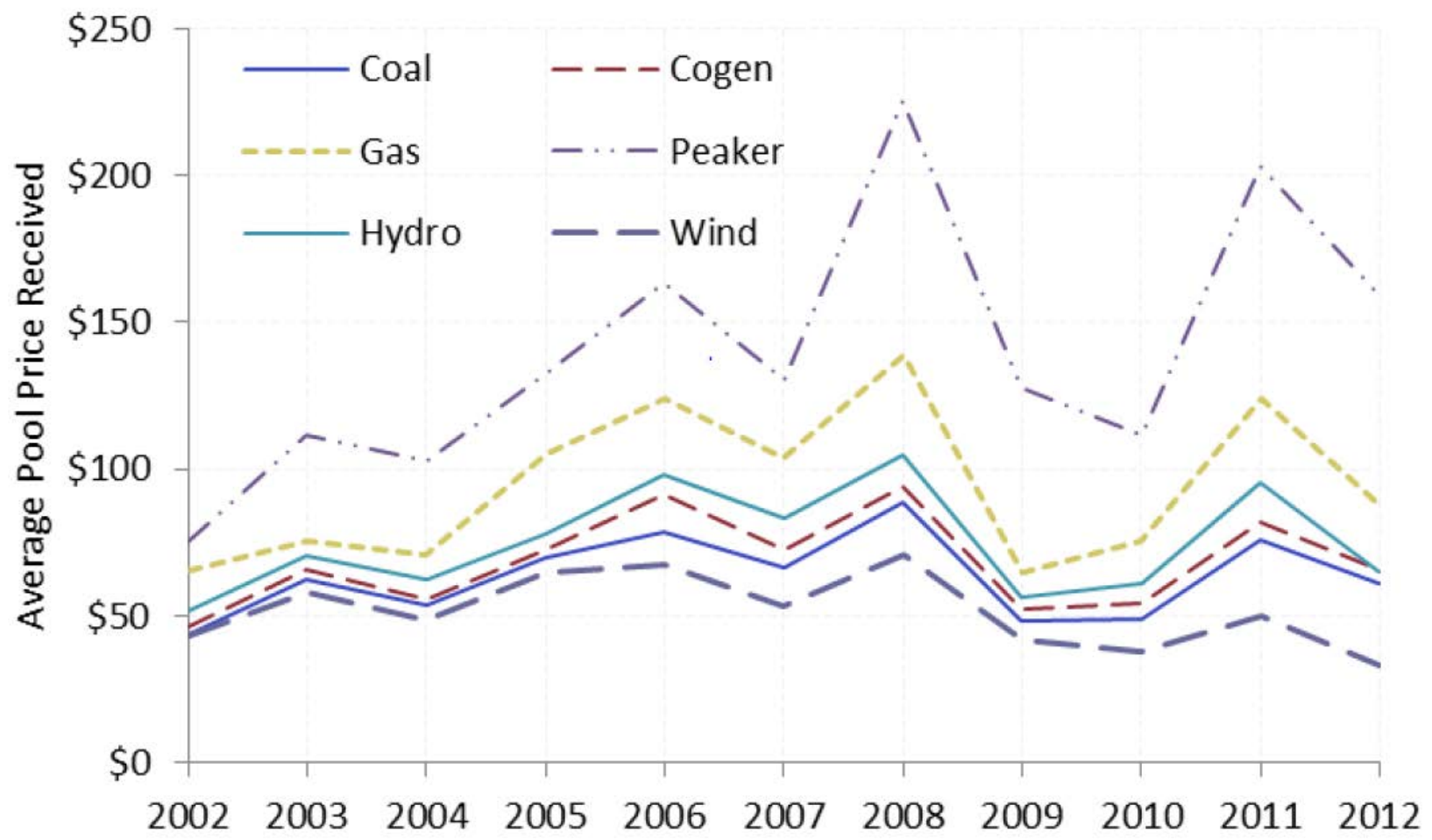
Revenue Curves

Hourly Revenues for a 1MW Solar Farm (\$)





Other technologies



Source: Figure 3.9, *State of the Market Report 2012*



Integrating solar in the Alberta market

- Understanding the framework set out in the legislation
- Does solar generation face any unique barriers?
- Developers v. market participants



Questions?