

# **APEX Power Services Corporation**

**Presentation**

to

**Landfill Methane Outreach Program**

**Baltimore, Maryland**

**January 30<sup>th</sup>, 2013**

# About APEX

- An independent energy consultant and advisor
- Experienced in all phases of fossil & renewable energy
- Experts in leading-edge energy purchase/supply options
- Knowledgeable in energy regulatory policies/procedures
- Represents large energy consumers/producers in North/Central America
- Works closely with financial institutions and funding sources
- Leaders in identifying “economic” enhancement opportunities
- Providers of expert testimony at both the state & federal levels

Provides *“Complete Energy Solutions”*

# Current Electric Energy Industry Market Conditions

- Very low natural gas prices (implications for coal?)
- Recent bankruptcy filing of Midwest Gen 12/17/12
- Recent sale: Exelon sold three coal plants to Riverstone Holdings
  - ◆ \$400 mm or \$151/kW (2,648 MW)
- Extremely low electric prices (fossil fuel marginal cost?)
- Natural gas supplies continue to outpace domestic demand
- NYMEX NG Futures 18 Mth Strip @ \$3.85/mmBtu
- Majority of all new generation is NGCC, Solar, wind, & LFG
- Fewer market participants – ongoing consolidation
- Electric generating capacity glut in some areas
- Stagnant demand for green/renewable energy
- Little interest in long term exposure to merchant capacity

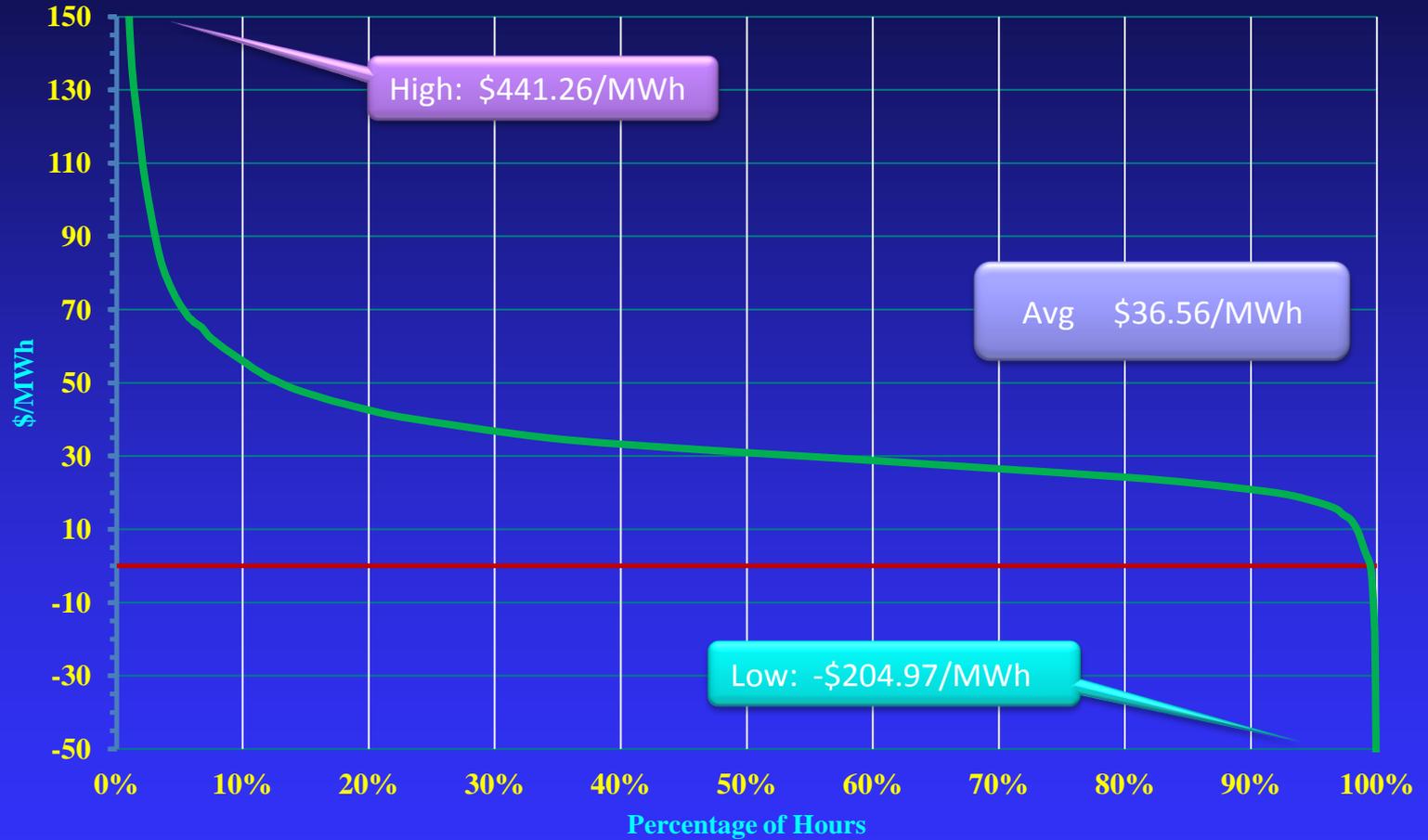
# Market Issues & Opportunities

- Large coal plants struggling to maintain profitability
- Off-peak power pricing - Will pricing improve?
- Coal plant retirements/Low NG prices – Transmission relief??
- Distributed Generation – Value of voltage support
- Fuel diversity and security of supply concerns
- Environmental obstacles forcing fuel choices
- “Renewable” energy portfolio standards (RPS)
- Consumer Demand – Decreasing??
  - Residential vs. Commercial vs. Industrial [load factor impact]
- Value of firm versus non-firm capacity

# Excess Generating Capacity

- Some large markets over-built with 20-30% excess
- Projected electric growth rates reduced ( $< 1.0\%$  annually)
  - ◆ Marginal price increases short term
  - ◆ Energy efficiency pressuring consumer demand
  - ◆ RTP shifting consumer behavior
- Transmission constraints contribute to market inefficiency
- Long term market outlook of soft prices and thin margins
- How long can corporate entities sustain losses
- What is the real story.....

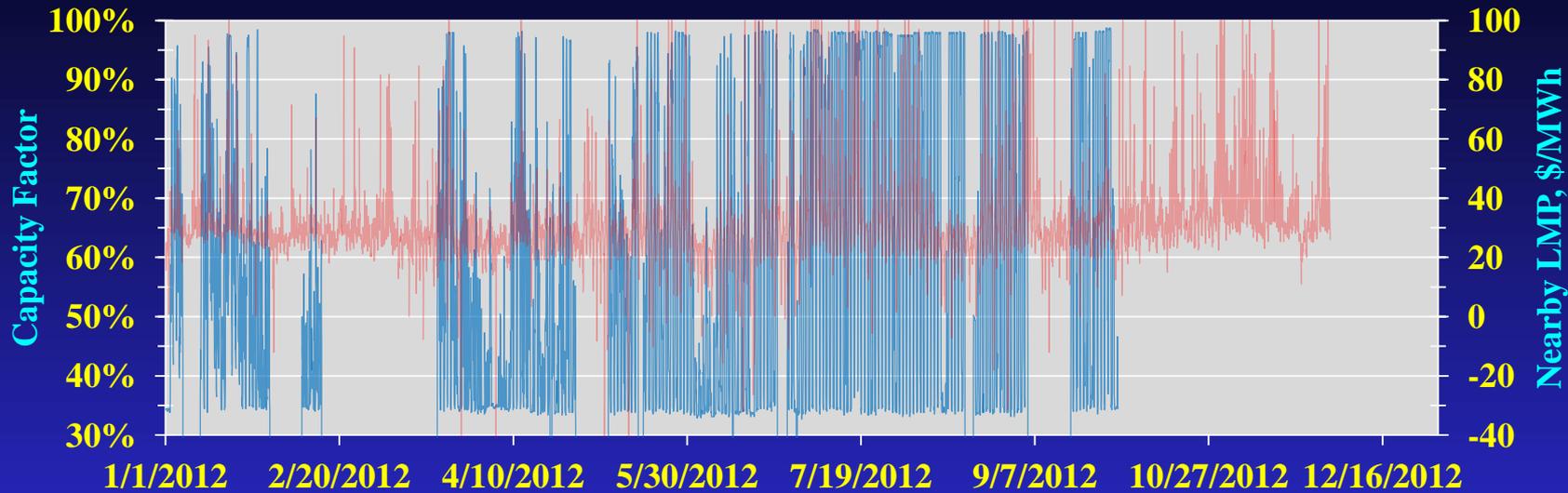
# PJM PNode EASTERN HUB RT LMP Price 2012



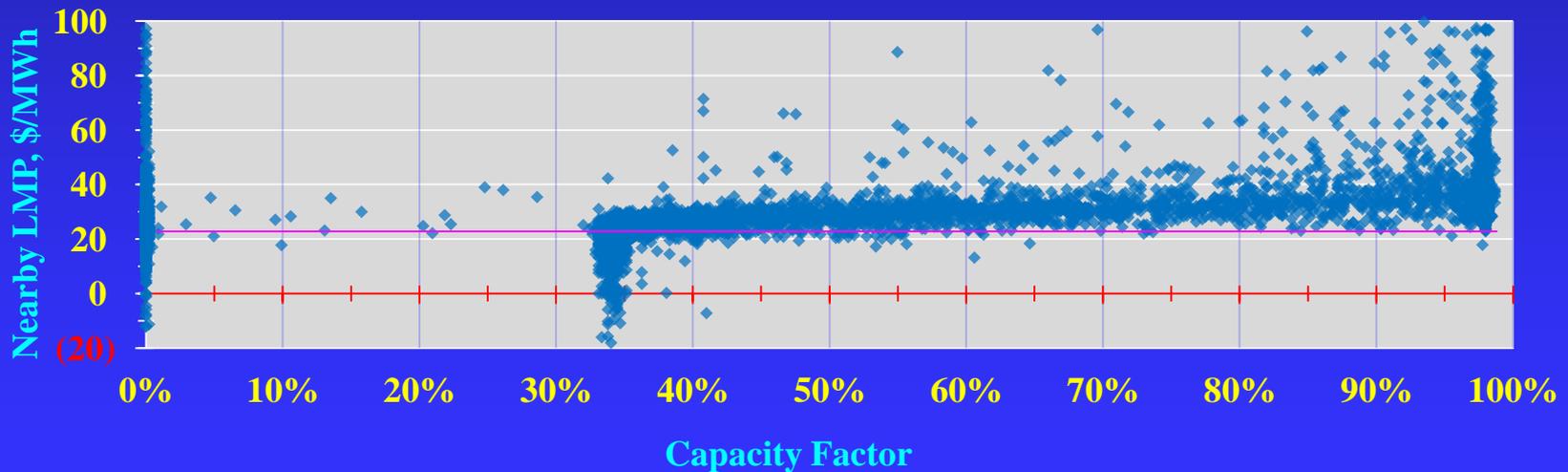
# Ohio Coal Unit

## Hourly Capacity Factor vs. LMP Time Series

Blue - Hourly CF  
Red - Hourly LMP

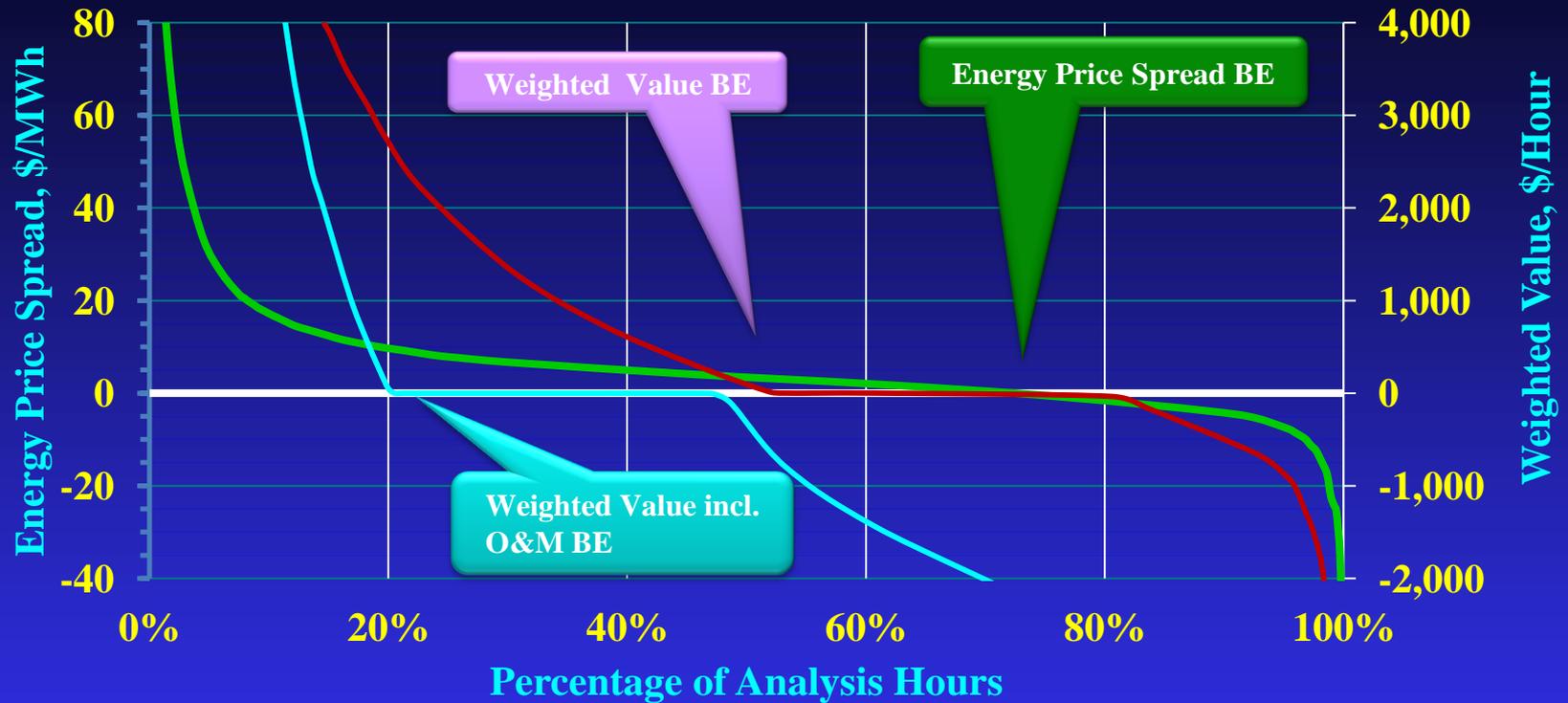


## Hourly Capacity Factor vs. LMP Scatter Plot



# Ohio Coal Unit

## Price Spread & Value Duration Curves - 2012 Sep

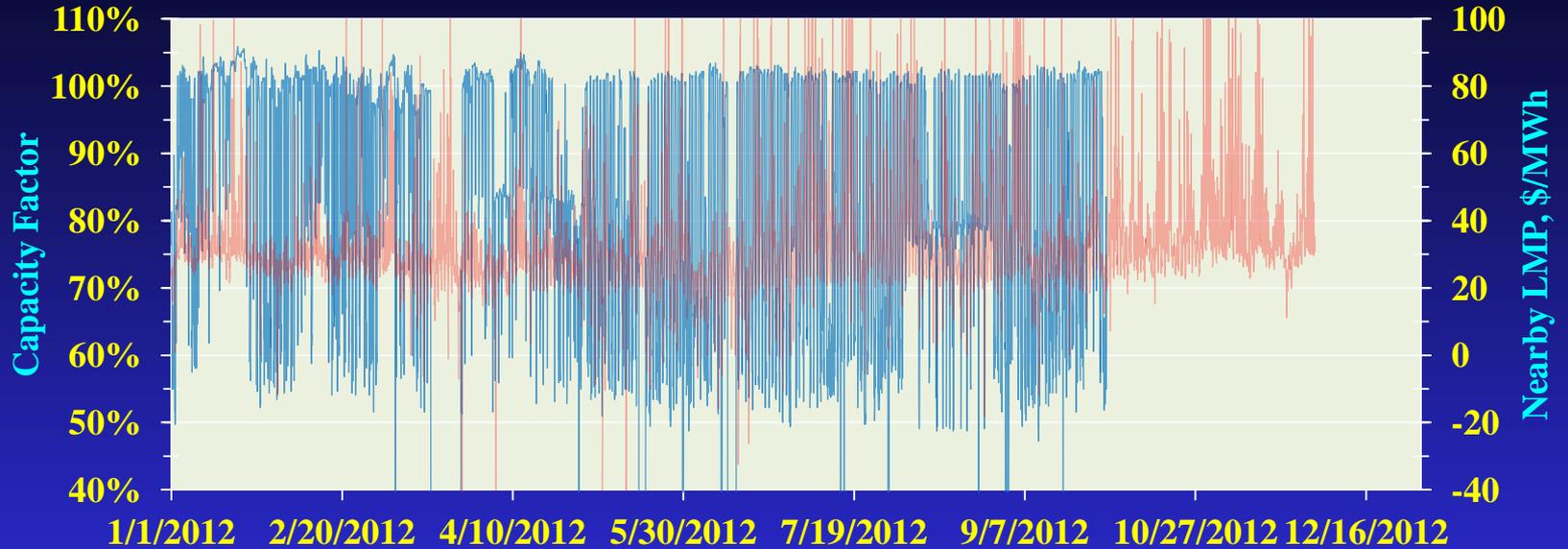


LMP to Marginal Cost Price Spread	
72%	% of Hours above Break Even
11.64	\$/MWh Average above Break Even
(5.10)	\$/MWh Average at or below Break Even

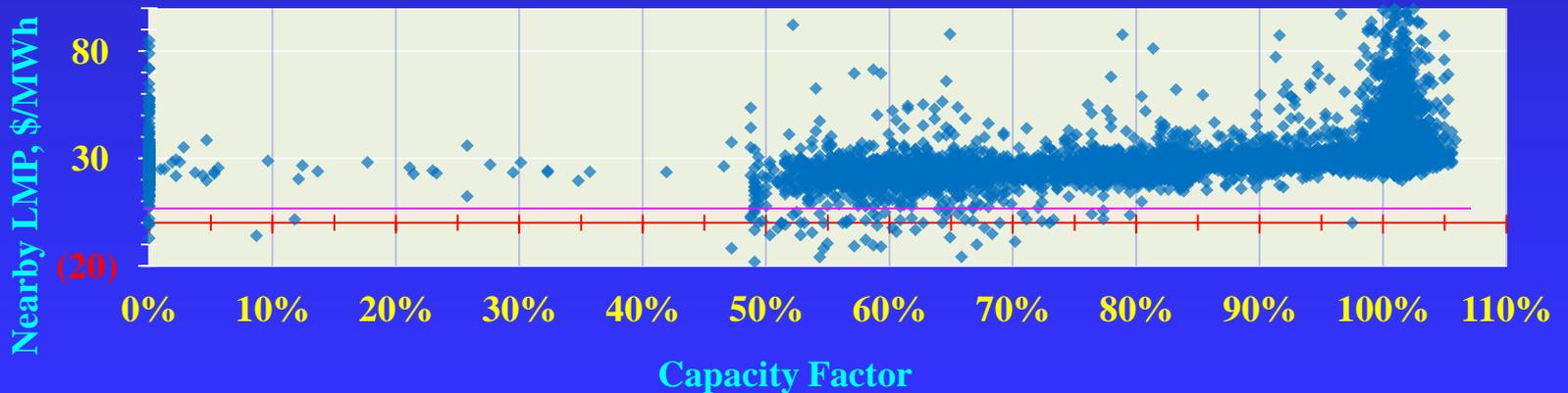
Weighted Value of Price Spread	
53%	% of Hours above Break Even
17,406,414	\$ above Break Even
(1,090,352)	\$ at or below Break Even
20%	% of Hours above Break Even (w/O&M)
21,180,650	\$ above Break Even (w/O&M)
(8,898,728)	\$ at or below Break Even (w/O&M)

# Ohio NGCC Unit Hourly Capacity Factor vs. LMP Time Series

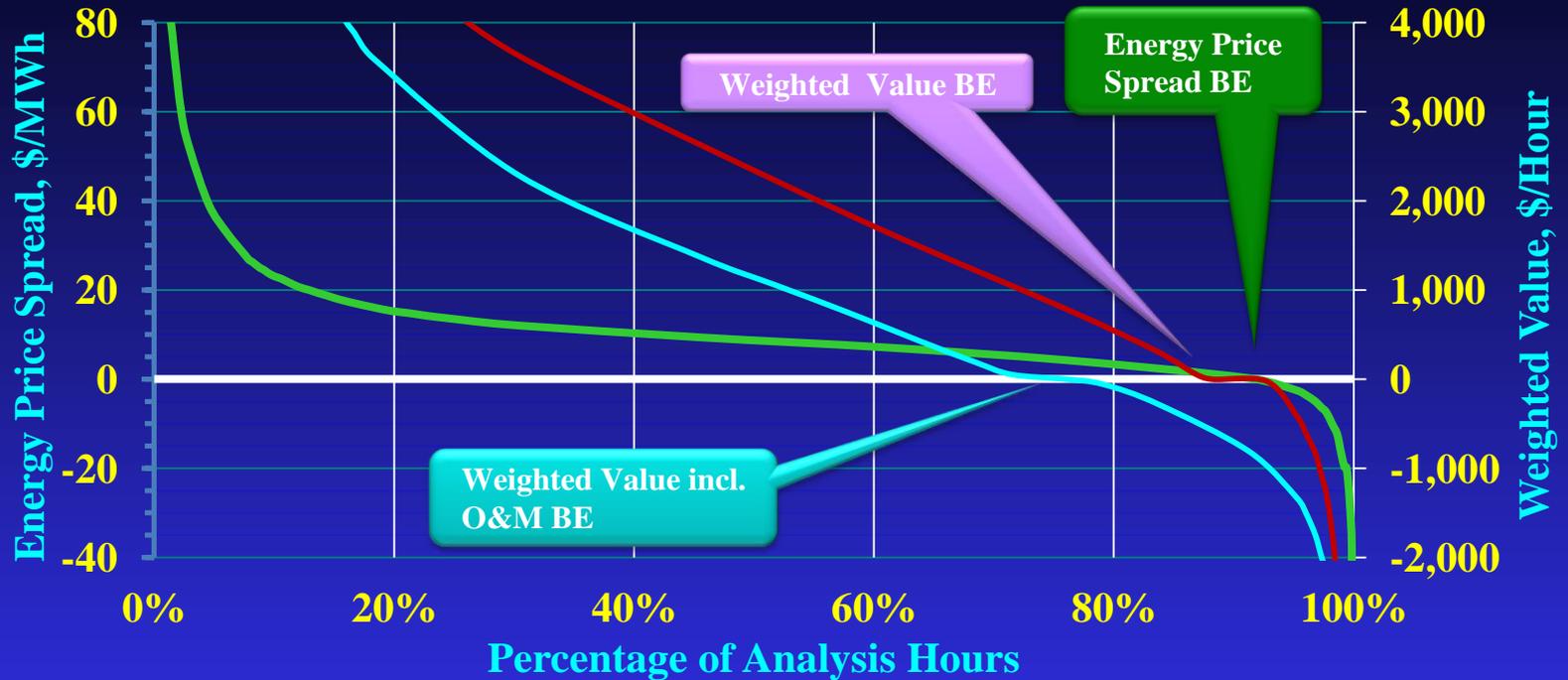
Blue - Hourly CF  
Red - Hourly LMP



## Hourly Capacity Factor vs. LMP Scatter Plot



## Ohio NGCC Unit Price Spread & Value Duration Curves - 2012 Sep

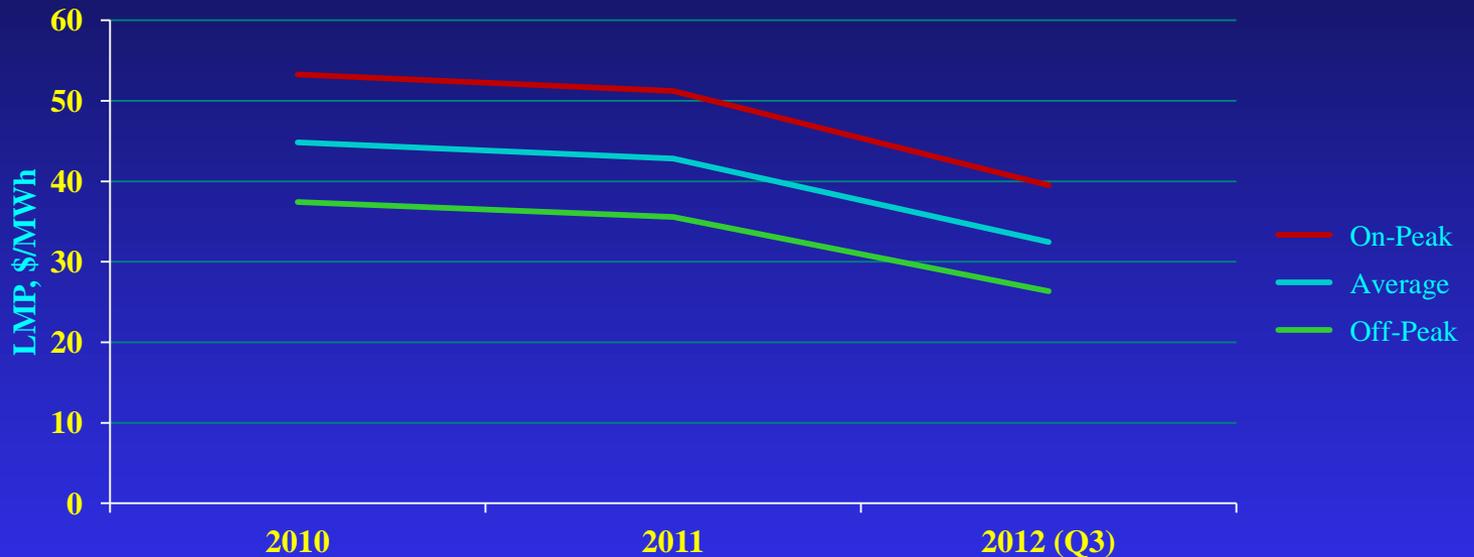


LMP to Marginal Cost Price Spread	
92%	% of Hours above Break Even
13.77	\$/MWh Average above Break Even
(7.29)	\$/MWh Average at or below Break Even

Weighted Value of Price Spread	
88%	% of Hours above Break Even
24,211,653	\$ above Break Even
(720,514)	\$ at or below Break Even
73%	% of Hours above Break Even (w/O&M)
17,693,457	\$ above Break Even (w/O&M)
(1,550,222)	\$ at or below Break Even (w/O&M)

# PJM Historical Prices

## System-wide Real Time LMP



Market Heat Rates		2010	2011	2012 (Q3)
Nat Gas, \$/mmBtu	Average	4.40	4.05	3.00
	Heat Rate, mmBtu/MWh	10.2	10.6	10.8
	On-Peak	12.1	12.6	13.2
	Off-Peak	8.5	8.8	8.8

# Forward Prices - PJM West

	On Peak	Off Peak
■ 2012	38.09	28.02
■ 2013	43.68	32.01
■ 2014	46.40	34.37
■ 2015	48.96	36.31
■ 2016	51.14	38.02
■ 2017	53.84	41.35
■ 2018	56.56	43.43

# Electric Sale Options

- Direct sale may be an option - but regulatory and commercial issues can be very cumbersome
- Credit issues and deliverability obligations can make direct sale very difficult
- Sophisticated lease/ownership structures may be a minimum requirement for direct sales in regulated states
- Aggregate multiple facilities
- Firm sale of power (maximize revenue/minimize risk)

# Electric Sale Options (cont)

- Synthetic commercial structures may be applicable to some LFG electrical generation projects
  - ◆ Heat rate & fixed price agreements with base price minimums available
  - ◆ Products offered by financial institutions & energy trading companies
  - ◆ Fixed for floating SWAP
  - ◆ Floor/cap products to sustain off peak power losses
  - ◆ Allows LFG owners to hedge revenue streams against volatile electric prices

# Electric Sale Options (cont)

- ◆ Renewable energy resource such as LFG can be used to hedge against rising energy prices
- ◆ Multiple of products based on variables such as individual risk profiles and market characteristics
- ◆ Many options to maximize LFG value

## FORCED OUTAGE INSURANCE EXAMPLE

Landfill Gas Operator evaluating 10 MW Firm Power versus Unit Contingent sale for on-peak (5x16 period) 2013 period

Operator evaluates cost/benefit of purchasing forced outage coverage for 10 Mw facility and selling firm, instead of selling Unit Contingent (at lower market prices)

Forced Outage coverage for 5x16 period based on current ERCOT North Zone 5x16 prices (\$45.76/MWh average for 2013)

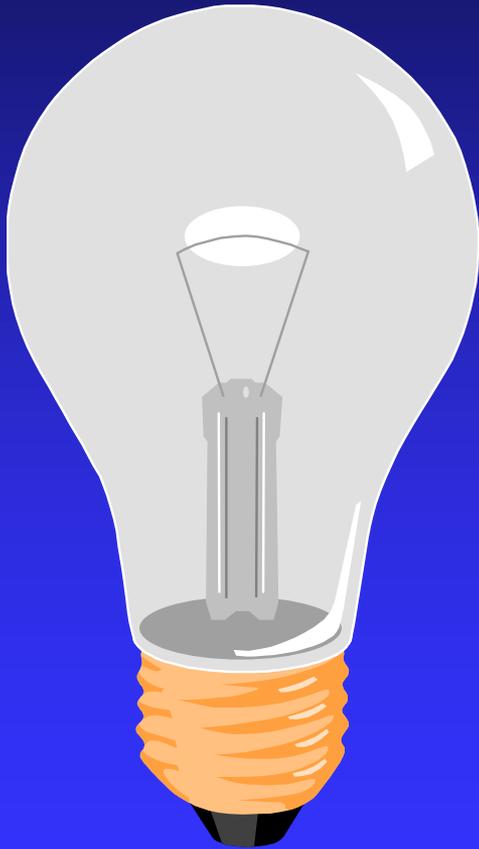
Forced Outage coverage would have 0 deductible, with a \$5,000,000 Maximum Payout

2013	NYMEX Natural Gas (\$/mmBtu) as of 11/27/12	ERCOT North Zone 5x16 OnPeak (\$/MWhr)	Implied On-peak Heat Rate (mmBtu/MWh)	Landfill Gas Plant (MW)	On-peak MWh for 10 MW	Revenue (assuming 10 MW on-peak sold at market)	Unit Contingent Revenue (assume 90% of market for 10 months, 80% July-Aug)	Lost Revenue of Unit Contingent vs. Firm Sale	Lost Revenue of Unit Contingent vs. Firm Sale (\$/MWh on-peak)	Swiss Re: Forced Outage \$ Expense (10 MW)	Swiss Re: Forced Outage Expense (\$/MWh)	Effective OnPeak Revenue (Firm Market Sales Revenue- Forced Outage Expense)
Jan	3.868	34.09	8.81	10	3,520	\$ 119,997	\$ 107,997	\$ 12,000	\$ 3.41	\$9,000	\$ 2.56	\$ 110,997
Feb	3.883	37.07	9.55	10	3,200	\$ 118,624	\$ 106,762	\$ 11,862	\$ 3.71	\$9,000	\$ 2.81	\$ 109,624
Mar	3.862	34.38	8.90	10	3,360	\$ 115,517	\$ 103,965	\$ 11,552	\$ 3.44	\$9,000	\$ 2.68	\$ 106,517
Apr	3.838	34.87	9.09	10	3,520	\$ 122,742	\$ 110,468	\$ 12,274	\$ 3.49	\$9,000	\$ 2.56	\$ 113,742
May	3.869	39.05	10.09	10	3,520	\$ 137,456	\$ 123,710	\$ 13,746	\$ 3.91	\$12,000	\$ 3.41	\$ 125,456
Jun	3.905	51.21	13.11	10	3,200	\$ 163,872	\$ 147,485	\$ 16,387	\$ 5.12	\$16,000	\$ 5.00	\$ 147,872
Jul	3.945	74.56	18.90	10	3,520	\$ 262,451	\$ 209,961	\$ 52,490	\$ 14.91	\$20,000	\$ 5.68	\$ 242,451
Aug	3.965	88.86	22.41	10	3,520	\$ 312,787	\$ 250,230	\$ 62,557	\$ 17.77	\$20,000	\$ 5.68	\$ 292,787
Sep	3.969	45.67	11.51	10	3,200	\$ 146,144	\$ 131,530	\$ 14,614	\$ 4.57	\$12,000	\$ 3.75	\$ 134,144
Oct	4.006	38.42	9.59	10	3,680	\$ 141,386	\$ 127,247	\$ 14,139	\$ 3.84	\$9,000	\$ 2.45	\$ 132,386
Nov	4.105	34.82	8.48	10	3,200	\$ 111,424	\$ 100,282	\$ 11,142	\$ 3.48	\$9,000	\$ 2.81	\$ 102,424
Dec	4.288	36.09	8.42	10	3,360	\$ 121,262	\$ 109,136	\$ 12,126	\$ 3.61	\$9,000	\$ 2.68	\$ 112,262
Average	3.959	45.76	11.56		40,800	\$ 1,873,662	\$ 1,628,772	\$ 244,890		\$143,000		\$1,730,662

# Overall – Opportunities Do Exist

- The sky's the limit – many attractive arrangements may be possible in today's energy marketplace
- Thoroughly understand available options and risks
  - ◆ technical feasibility
  - ◆ financial impacts and viability
  - ◆ long/short term risk-reward
  - ◆ Be open to change – Standard PPA may not be available
- Fully research long term energy and green tag markets prior to closing any deal (e.g. be informed and cautious)
- Seek “independent” advice tailored to your situation
- Challenge your energy partners to provide competitive, “market priced” products and services

# APEX Power Services Corporation



*Complete Energy Solutions*