Overview of Power Generation Investment Considerations

August 24, 2020

PSEG

Initial considerations

- Strategic considerations
  - Market – one of our core markets (PJM, New England, New York)?
  - What are underlying market fundamentals at this location?
  - Fuel type and technology
  - Supply situation/pending new builds and retirements
  - Dispatch flexibility and portfolio value
  - Current and anticipated regulatory environment
  - Any additional value PSEG can bring?
  - Synergies with any additional facilities?

- Opportunity specifics/dynamics
  - Anticipated competition to win the transaction
  - Process/timing
  - Size of capital commitment relative to alternative uses

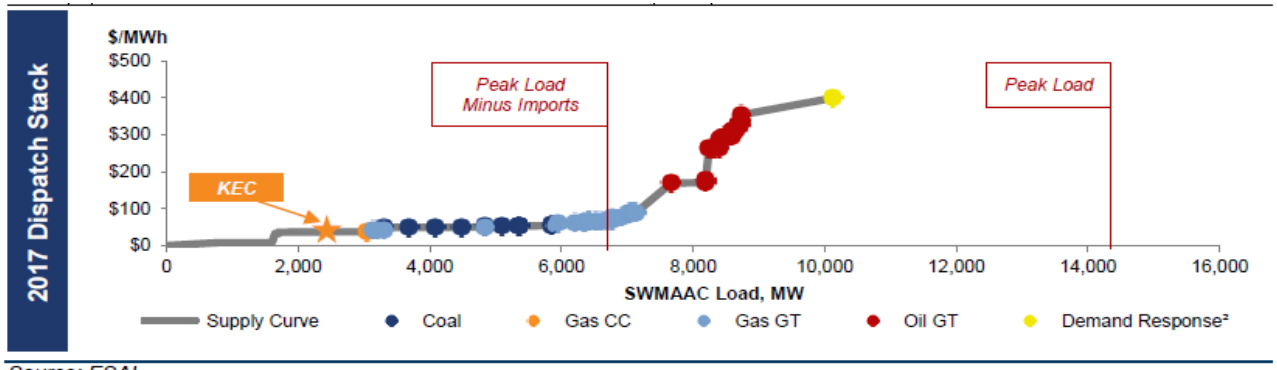
Key valuation inputs

- **Revenues**
  - Energy
    - Forward market pricing assumptions
    - Long-term fundamental analysis
    - Future carbon pricing
    - Potential transmission congestion
  - Capacity
    - Market by market outlook
  - Ancillaries
    - Typically minor component of total revenue

- **Costs**
  - Fuel prices
  - Emission costs
  - O&M
  - Major maintenance
  - Capital expenditures

A real life example

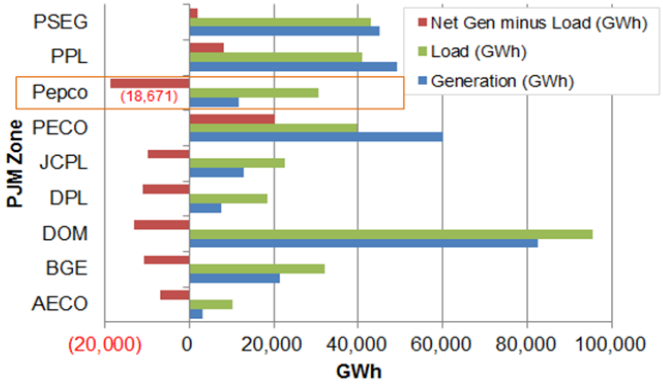
Keys will sit favorably near the bottom of the projected 2017 SWMAAC dispatch stack



Source: ESAI
Note: Dispatch curve excludes 8.0 GW of transmission capacity into the SWMAAC LDA.

- The dispatch stack ranks generating units based on marginal cost of production; being lower on the stack translates into higher runtimes and higher margins for a given sale price of electricity

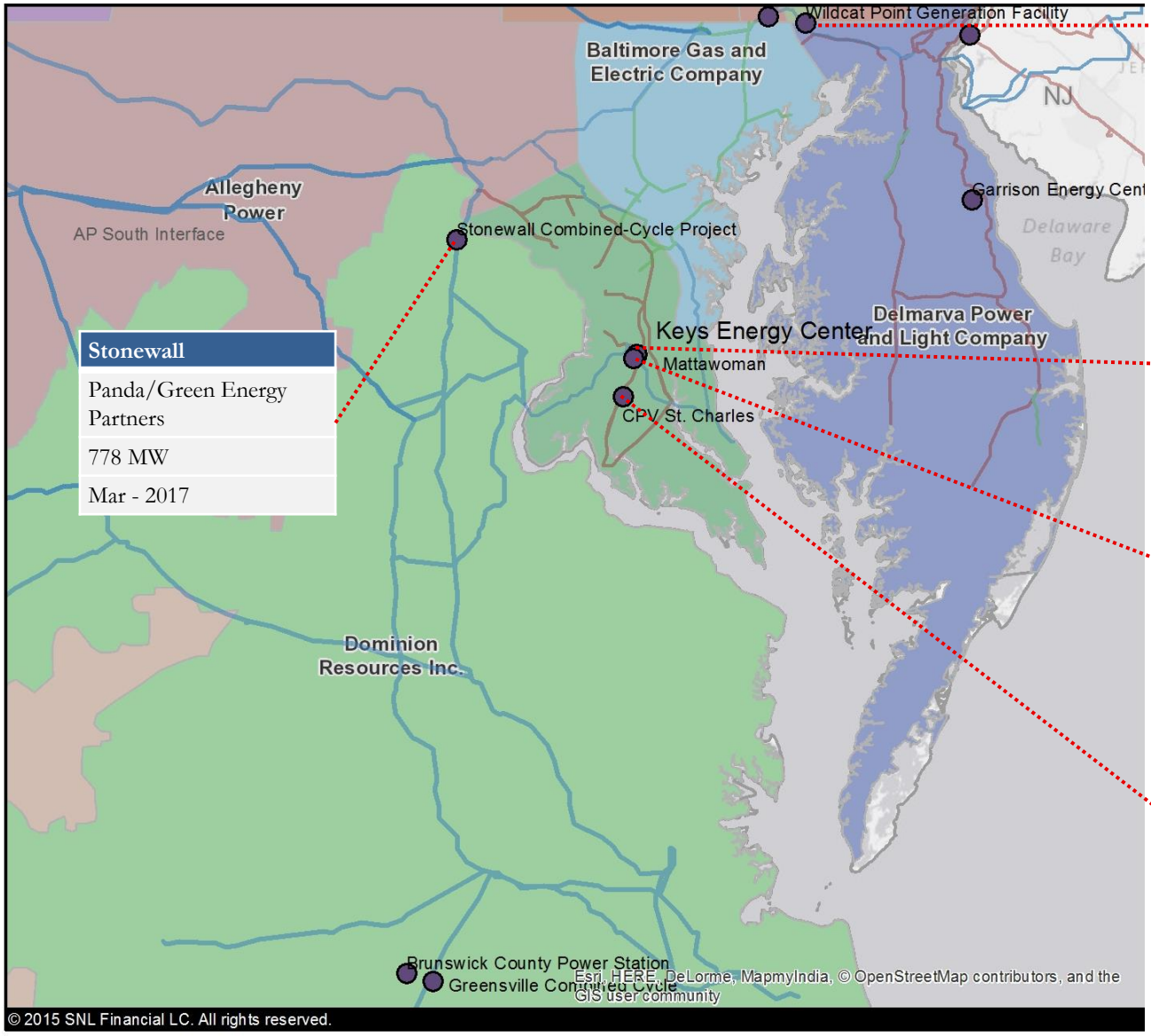
2014 Generation & Load by Zone
(for selected Eastern Zones)



- PEPCO currently has the largest generation/load imbalance of any PJM zone
- It is surounded by zones that are short generation and which are expected to remain dependent on imports for the foreseeable future
- Also dependent on older steam generation, with 1,204 MW of planned coal retirements[2]
- Borders Dominion, which has the highest forecasted load growth in PJM[1]

[1] PJM's 2014 RTEP load forecast report anticipates a 1.8% compound annual growth rate for load in Dominion Zone for 2014-2024
[2] Data sourced from the PJM 2014 State of the Market Report

Other new-builds in the area



Stonewall
Panda/Green Energy Partners
778 MW
Mar - 2017

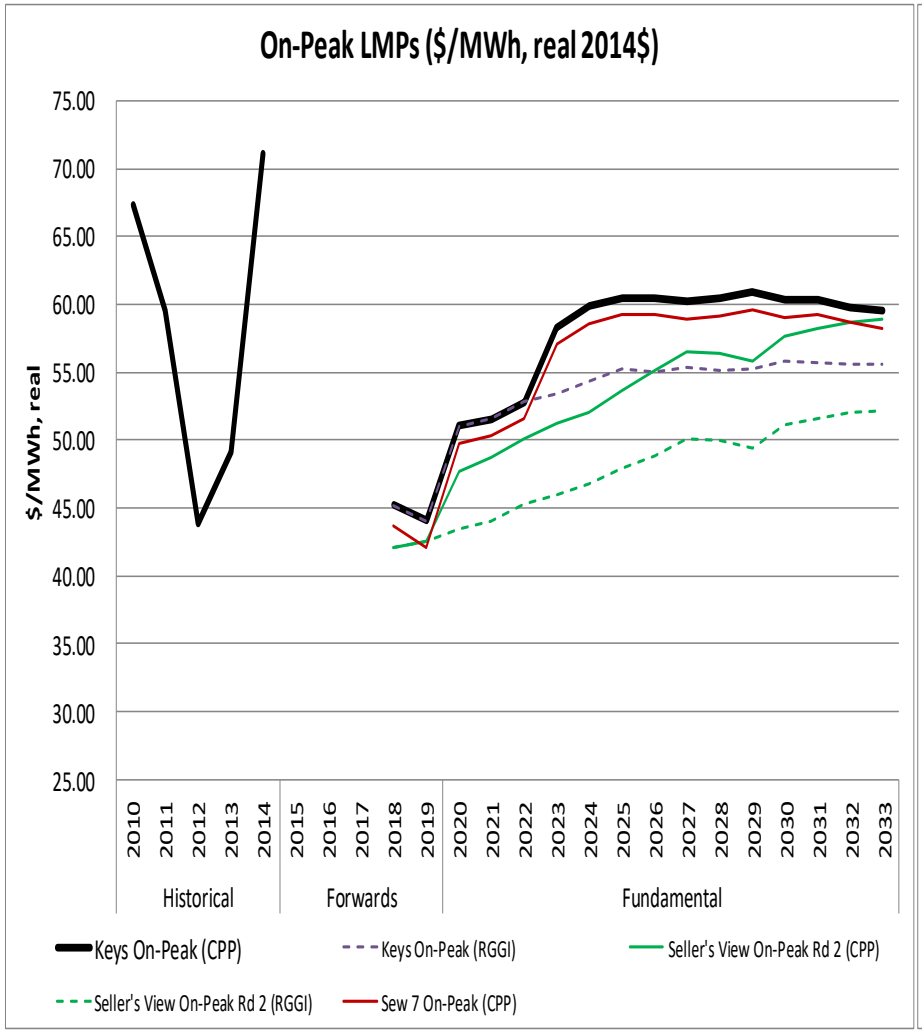
Wildcat Point
ODEC/Essential Power
1,000 MW
Jun - 2017

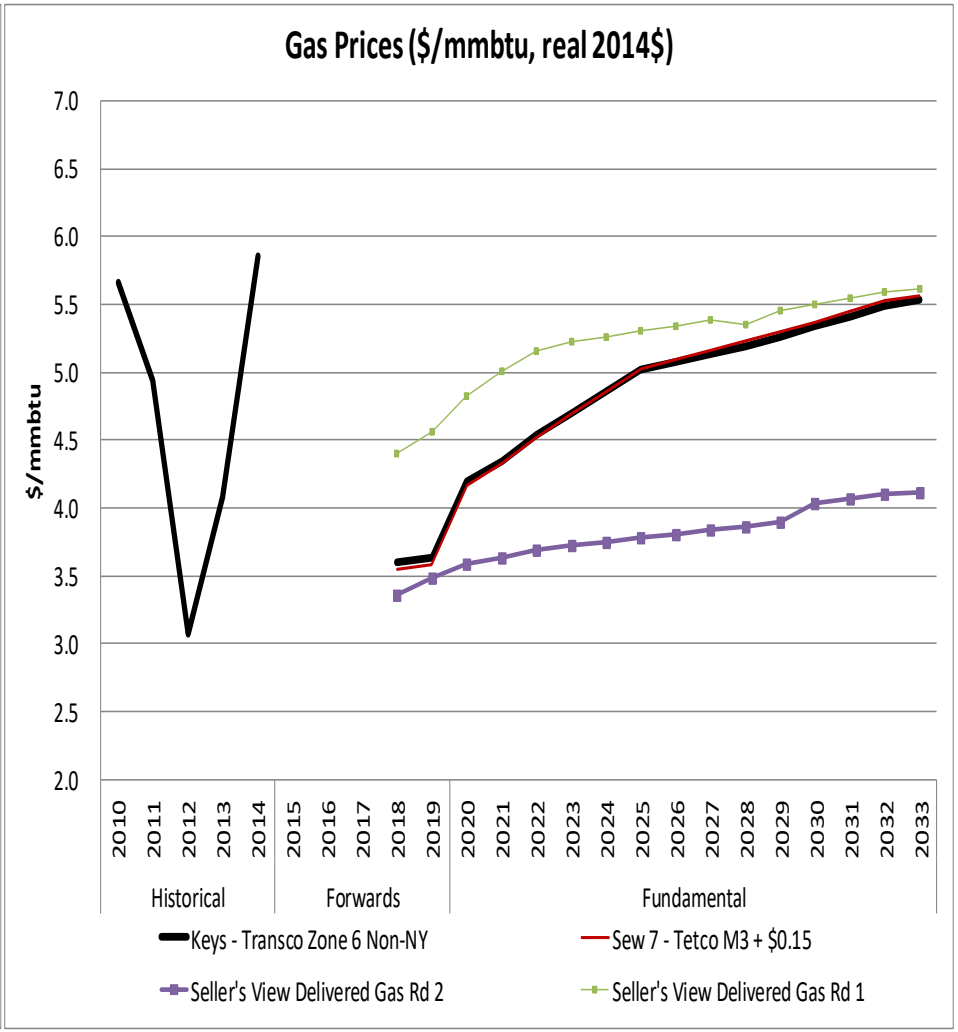
Keys Energy Center
Genesis Power
761 MW
Apr - 2018

Mattawoman
Panda
1,008 MW
May - 2018

CPV St. Charles Combined Cycle
CPV / Marubeni / Toyota Tsusho
725 MW
Jun - 2016

Energy market assumptions – electric and gas prices





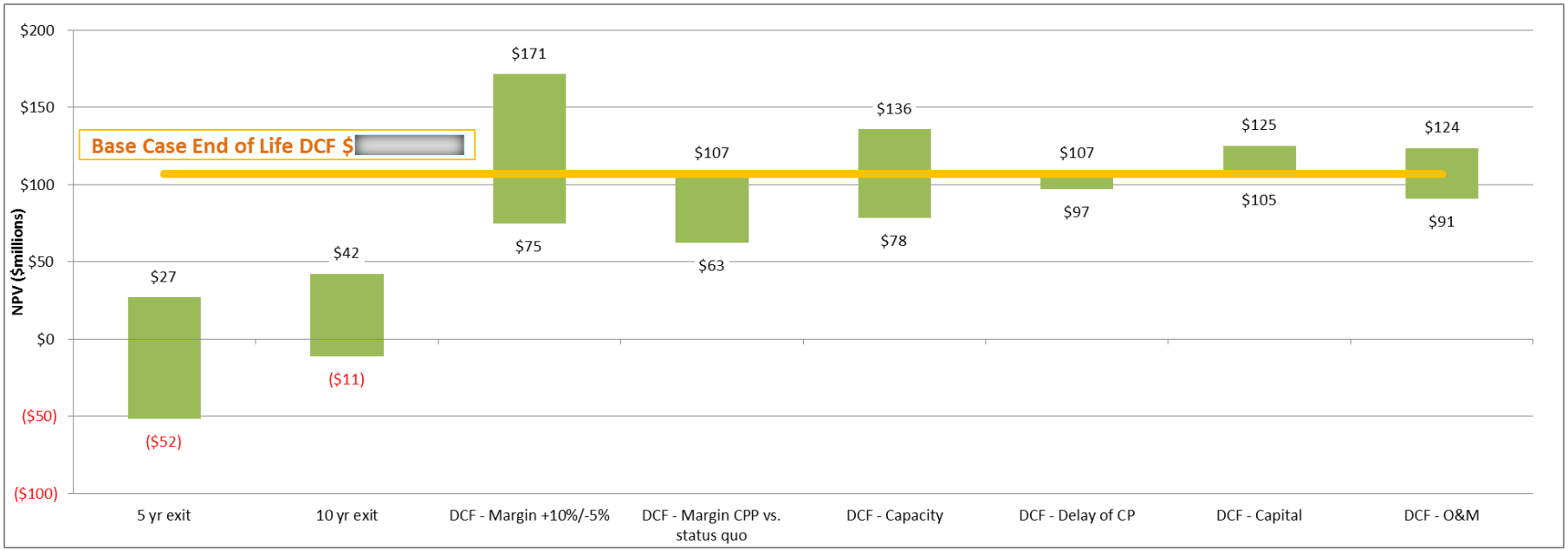
General due diligence and risk assessment

- Permits
- Real property
- Employee matters
  - Pensions
  - Unions
- Commercial agreements
  - Grid interconnection
  - Gas supply
  - Water
  - Parts and services
- Environmental conditions, liabilities
- Equipment
  - Condition, warranties, required maintenance and/or repairs

Valuation metrics introduction

Method	Calculation	Relative Comparison	Relevance
Discounted Cash Flow (DCF) Analysis – Full Life	Unlevered discounting of free cash flows throughout the life of the project at Power's weighted average cost of capital (WACC)	Resulting net present value (NPV) relative to (a) zero and (b) alternative uses of capital	• Most widely accepted method for assessing long-term value • Accuracy of projections varies increasingly with time • Not typically used for near term sell side valuation
Profitability Index (PI)	Present value of a project's future cash flows divided by the initial investment	PI >1 connotes positive NPV PI <1 connotes negative NPV	• Highlights the magnitude of NPV return per $1 invested • Useful for ranking projects in capital allocation decision making
DCF Analysis – Selected Exit Prior to End of Life	Discounted sum of (a) unlevered free cash flows throughout the assumed operating period; and (b) estimated terminal value at an assumed year of exit – all discounted at Power's WACC	Resulting NPV relative to (a) zero and (b) alternative uses of capital	• Method most relied upon by financial investors given its alignment with their investment time horizons • Significant subjectivity in terminal value estimate
Implied EBITDA multiple	Total purchase price or aggregate development capital costs divided by project adjusted EBITDA in a given year. EBITDA is adjusted to exclude major maintenance.	• Power's implied EBITDA trading multiple and EBITDA multiples of precedent transactions observed in the market • When multiple is lower than typical market range of 7x-9x, project is considered efficient generator of EBITDA	• Widely employed metric to compare current or short-term cash-flow generating ability • Relative to existing trading multiple, provides straightforward measure of accretion/dilution • Point-in-time snapshot, does not inform ability of total project to earn cost of capital
Implied Free Cash Flow Yield	For a given year, project unlevered free cash flow divided by total purchase price/aggregate development capital costs	• Resulting yield relative to (a) Power's WACC and (b) the yield of alternative projects • Favorable when higher than WACC in any given year, but does not directly account for return of investment	• IPPs and yieldcos use this metric, or a levered variant, in public equity markets • Proxy for all-in cash return in a given year • Point-in-time snapshot, does not inform ability of total project to earn cost of capital

Valuation summary including sensitivities



Exit at end of year 5 (2023) at 7.0x to 9.0x year 6 EBITDA	Exit at end of year 10 at 7.0x to 9.0x year 11 EBITDA	High (+10%) and low (-5%) margin estimates	Base case with CPP vs. status quo w/o CPP	High (+10%) and Low (-10%) capacity estimates	2 year delay of Capacity Performance	50% and 95% view on capital vs. 90% confidence level	High (+10%) and Low (-10%) O&M estimates

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Adjusted EBITDA (excludes Major Maintenance)	**($0.3)**	**($0.5)**	**($10.9)**	**$76.7**	**$101.2**						
Adjusted EBITDA multiple					**8.2x**						
Free Cash Flow - unlevered	**($295.1)**	**($312.7)**	**($198.4)**	**$28.9**	**$86.6**						
Yield (% of project cost)					**10.4%**						
EPS			**($0.01)**	**$0.03**	**$0.04**						

Increased capital and drives the need for meaningful subsidies – a simplified example

Year Number / Year		1 2020	2 2021	3 2022	4 2023	5 2024	6 2025	7 2026	8 2027	9 2028	10 2029	Terminal Value Est.
Project A - Combined Cycle, Natural Gas (1 GW @ $1,000/kw)												
Total Revenue (net energy & capacity)		$0	$0	$0	$150	$154	$158	$162	$166	$170	$174	
Total O&M		0	0	0	(40)	(41)	(42)	(43)	(44)	(45)	(46)	
EBITDA		0	0	0	110	113	116	118	121	124	128	$ 1,021
Less:Capital Expenditures		(200)	(400)	(400)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unlevered Free Cash Flow		(200)	(400)	(400)	110	113	116	118	121	124	128	1,021
Discount Factor		0.96	0.88	0.81	0.74	0.68	0.62	0.57	0.52	0.48	0.44	0.40
Present Value Cash Flow		(192)	(351)	(322)	81	77	72	68	64	60	56	413
Present Value of Project	**$25**											
Project B - Fusion (1 GW @ $6,000/kw)												
Total Revenue (net energy & capacity)		$0	$0	$0	$150	$154	$158	$162	$166	$170	$174	
Total O&M		0	0	0	(40)	(41)	(42)	(43)	(44)	(45)	(46)	
EBITDA		0	0	0	110	113	116	118	121	124	128	$ 1,021
Less: Capital Expenditures (6x higher)		(1,200)	(2,400)	(2,400)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unlevered Free Cash Flow		(1,200)	(2,400)	(2,400)	110	113	116	118	121	124	128	1,021
Discount Factor		0.96	0.88	0.81	0.74	0.68	0.62	0.57	0.52	0.48	0.44	0.40
Present Value Cash Flow		(1,149)	(2,109)	(1,935)	81	77	72	68	64	60	56	413
Present Value of Project	**($4,303)**											
Project C - Project B with Subsidy												
Total Revenue (more than 4x required)		$0	$0	$0	$685	$702	$720	$738	$756	$775	$794	
Total O&M		0	0	0	(40)	(41)	(42)	(43)	(44)	(45)	(46)	
EBITDA		0	0	0	645	661	678	694	712	730	748	$ 5,983
Less: Capital Expenditures (6x higher)		(1,200)	(2,400)	(2,400)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unlevered Free Cash Flow		(1,200)	(2,400)	(2,400)	645	661	678	694	712	730	748	5,983
Discount Factor		0.96	0.88	0.81	0.74	0.68	0.62	0.57	0.52	0.48	0.44	0.4046
Present Value Cash Flow		(1,149)	(2,109)	(1,935)	477	449	422	397	373	351	330	2,421
Present Value of Project	**$25**											

Assumptions:

Pre-tax analysis	
Inflation	2.50%
Discount Rate	9.00%
Terminal Value EBITDA multiple (x year 10)	8.0x

- Project A - $1 bn investment over 3 years, $25 mm NPV
- Project B – 6x the capital costs for similar MWs and generation output results in a large negative NPV
- Project C – to achieve the same returns as Project A, Project B would require a long-term subsidy of over 300% of the revenue provided by the market

Glossary of key terms

- **Ancillaries –** energy related activities supplied by generation unit owners to the wholesale market that are required by the ISO to ensure the safe and reliable operation of the bulk power system. Owners of generation units may bid units into the ancillary services market in return for compensatory payments. Costs to pay generators for ancillary services are recovered through charges collected from market participants.

- **Dispatch –** when an RTO, PJM for example, calls on a generation source to generate electricity that is "dispatched" to the electrical grid

- **DCF –** discounted cash flow; a valuation-related acronym for a project's free cash flows, discounted typically by a risk adjusted discount rate or hurdle rate

- **EBITDA –** Earnings before interest, depreciation, taxes and amortization; a financial measurement of a project's ability to generate cash from operations and widely used in the power generation industry

- **IPPs –** Independent Power Producer, or non-utility generator, is an entity which is not a public utility but which owns facilities to generate electric power

- **Load –** consumer demand for electricity on a given electrical system

Glossary of key terms - continued

- **LMP -** Locational Marginal Price is the marginal price for energy at the location where the energy is delivered or received, expressed in dollars per megawatt-hour ($/MWh)
- **Load –** the overall usage or consumption of electricity on a power supply, generally expressed in kilowatt-hours (KWh) or megawatt-hours (MWh)
- **O&M –** operations and maintenance; typically the sum of a projects non-fuel related operating costs
- **On-peak -** a period of time when consumers typically use more electricity -- normally on weekdays, when many businesses are operating.
- **PJM -** PJM Interconnection is a regional transmission organization (RTO) that coordinates the movement of electricity through all or parts of DE, IL, IN, KY, MD, MI, NJ, NC, OH, PA, TN, VA, WV and DC. The majority of our generating stations operate in PJM.
- **SWMAAC –** one of various sub-regions or "locational deliverability areas" (LDAs) within PJM used in evaluating locational transmission constraints. LDAs include transmission zones, sub-zones and combination of zones.
- **Unlevered –** a financial term typically used to describe consideration of a project free of any debt or "leverage"
- **Zone –** a transmission owner's area within the PJM Region

Fusion opportunities and challenges

- What is the levelized cost of energy (LCOE)?
- The public overwhelmingly supports (90%) renewable energy, especially solar and wind
- Seasonal storage is discussed, but often ignored as an additional cost
- Externalities: carbon, yes; waste, yes; habitat, maybe; other?
- Complexity versus simplicity
- Solutions are needed before 2050