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NYISO 2015/2016 ICAP Demand Curve Reset

Financial Parameters

ICAPWG
June 2, 2016

Today's Presentation

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- **Provide additional information and preliminary recommendation for financial parameters**
  - Weighted Average Cost of Capital (WACC), including:
    - Debt to Equity Ratio (D/E Ratio)
    - Cost of Debt (COD)
    - Return on Equity (ROE)
  - Amortization period
- **Financial parameters are utilized in conjunction with the cost estimates for the candidate peaking unit technologies developed by Lummus Consultants International (Lummus) to determine the localized levelized embedded cost for each candidate technology**
  - Translation of levelized cost and net Energy and Ancillary Services (EAS) revenues into reference point prices is covered in an additional presentation

Conceptual Framework

- **Financial parameters should reflect project specific risk to future cash flows for a merchant developer based on investor expectations over the life of the project**

- **Appropriate WACC for a new merchant project in the NYCA is bounded by the WACCs for publicly traded independent power producers (IPPs) and "project finance" developments**
  - The WACC for a new merchant project is generally greater than the WACC for publicly traded IPPs, since IPPs include various hedges, long-term contracts and a diverse asset portfolio (varied geographies with different load profiles, vintages and technologies)

$$WACC_{IPP} < WACC_{Project}$$

  - The WACC for a new project financed through balance sheet financing will generally be less than one financed through "project finance"

$$WACC_{Project} < WACC_{Project\ Finance}$$

- **Financial parameters are inter-related, require internal consistency, and should be evaluated holistically**
  - For example, COD, ROE, and D/E Ratio are strongly interdependent

- **Market factors can affect risk and the determination of financial parameters:**
  - Developer must assess potential to earn expected net EAS revenues over the physical life of the plant given a host of market changes:
    - price and load growth uncertainty,
    - new technologies (esp. distributed generation),
    - transmission development, and
    - environmental regulations and other public policies
  - Risks inherent to the development of new resources (e.g., development period risks, NIMBY)

Approach

- **Assessing financial parameters requires application of reasoned judgment considering interrelationship of underlying elements, market analytics, and practical considerations tied to the specific context**

- **Financial parameters are developed through review of market data and information from a wide range of sources, including:**
  - Market data for certain publicly traded IPPs (Calpine, NRG, Dynegy and Talen)
    - D/E Ratios
    - COD (e.g., from recent issuances)
    - ROE (as measured, e.g., using the capital asset pricing model [CAPM])
  - Other sources of information on WACC for publicly traded companies (analyst assessments and fairness opinions)
  - Information on cost of debt and equity for non-public financing, including project finance

- **The following slides provide additional detail on the data considered in order to develop the preliminary recommendation set forth on Slide 5**

Preliminary Recommendation (WACC)

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- **<u>Recommendation</u>: After-Tax Weighted Average Cost of Capital (ATWACC) = 8.6%, reflecting D/E Ratio, COD and ROE, to be discussed in the following slides**

Inputs	ISO-NE and PJM (2014)	NYISO (2013)	Preliminary Recommendation
Return on Equity	13.8%	12.5%	13.4%
Cost of Debt	7%	7.0%	7.75%
Debt to Equity Ratio	60/40	50/50	55/45
WACC	9.7%	9.75%	10.3%
ATWACC	**8.0%**	**8.4%**	**8.6%**
Amortization Period (years)	**20**	**20**	**20**

Capital Structure (D/E Ratio)

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- **Considerations**
  - In principle, projects can be developed under a wide range of capital structures
  - Particular structure pursued by a developer may reflect many factors, including company finances and the risk profile of development (including availability of long term contracts)

- **Recommendation: Capital structure reflecting a 55/45 D/E Ratio**
  - Reflects, on balance, the observed increase in debt within IPP balance sheets since the last ICAP Demand Curve reset (DCR)
  - Observed increase in debt is due to several factors, including relatively low cost of debt

Capital Structure (D/E Ratio)

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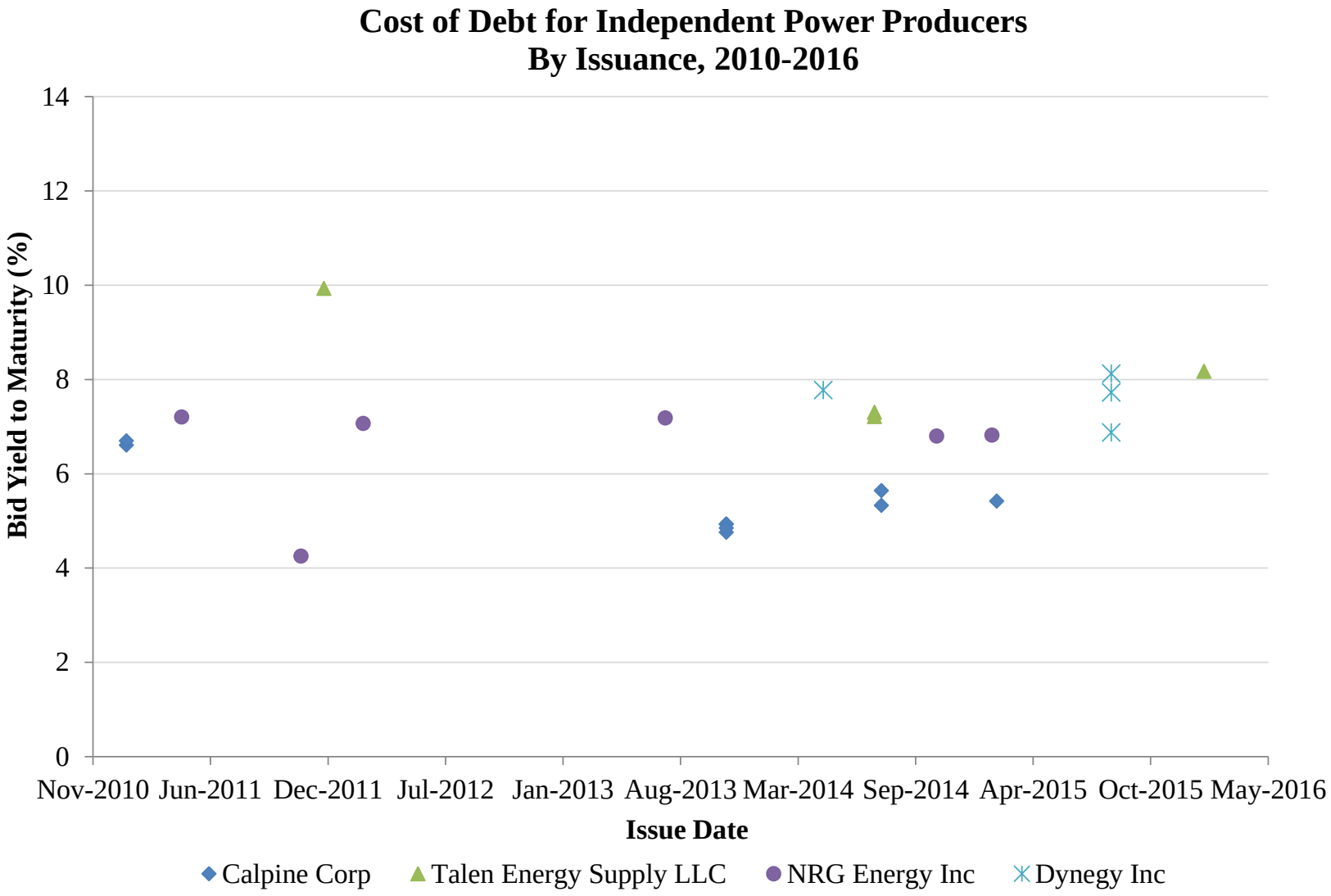
- **D/E Ratios have averaged 51% (Dynegy), 58% (Calpine) and 65% (NRG) over the past three years for the IPPs analyzed**
  - Corporate debt levels may not be indicative of appropriate project-level capital structure
  - Talen Energy was founded in 2015; therefore, three years of historical data does not exist

- **Current debt to equity ratios are higher than the past few years, but merchant developers are indicating an intent to buy back debt and deleverage capital structure**
  - UBS Financial: "We believe all IPPS will accelerate their debt paydown efforts…" (How to Value Power? December 8, 2015)
  - NRG: "Strengthen the Balance Sheet: Reducing Debt, replenishing capital and streamlining costs to provide flexibility to take advantage of opportunities through all market cycles" (Full Year 2015 Results Presentation, February 29, 2016)
  - Calpine: "We definitely want to make sure we have a strong balance sheet, and that is very important to us. As you can see there's debt pay down occurring this year." (Earnings Conference Call, February 12, 2016)

- **Considerations**
  - Current IPP issuances range from 5.4% to 8.2% since January 2015
    - Median yield over this period is 7.3%
  - Current generic corporate bond yields over the past year have ranged from:4.6% to 7.1% (BB) and 6.25% to 10.2% (B)
    - Rates have risen somewhat in past 6 months
    - Median Yield for B rated bonds is 7.75%
  - Rate appropriate to particular risks of NYISO market, especially in comparison to other markets with long-term contracts
    - E.g., ~100 basis points differential between NYISO and CAISO rates

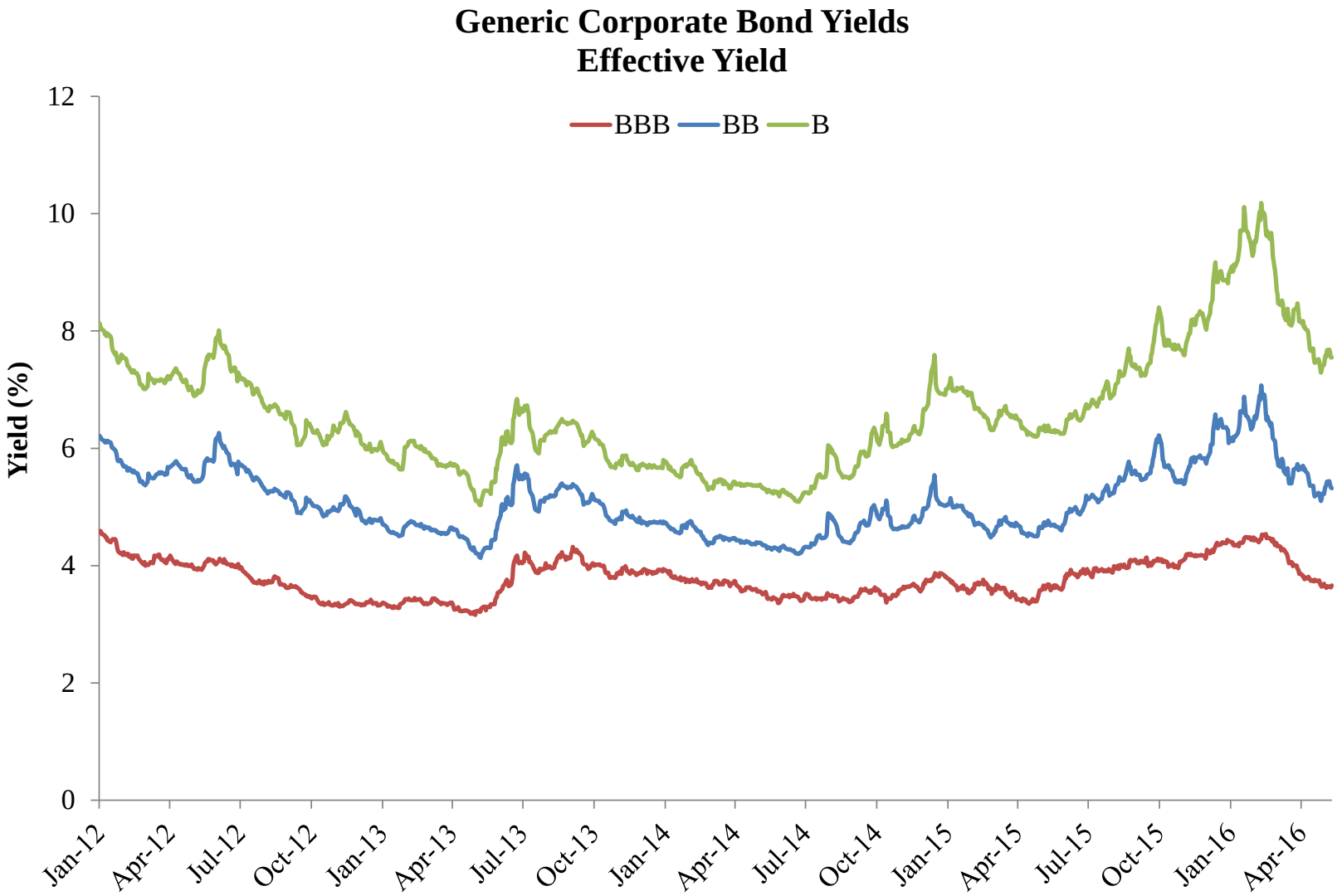
- **Recommendation: COD = 7.75%**

Cost of Debt for IPPs



Source: Bloomberg, L.P.

Generic Corporate Bond Yields



Source: Bank of America Merrill Lynch US Index Yields, available through St. Louis Fed.

Return on Equity

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- **<u>Considerations:</u> The ROE recommendation reflects consideration of several data points (described in the following slides):**
  - Regulated market ROEs (9-10%)
  - IPP balance sheet ROEs (10-11%)
  - Project Finance ROEs (16-20%)

- **Note that current FERC approved ROEs underlying demand curves for neighboring capacity markets (ISO-NE, NYISO, PJM) range from 12.5% (NYISO from last DCR) to 13.8% (PJM and ISO-NE periodic reviews, conducted after last NYISO DCR)**

- **<u>Recommendation</u>: ROE = 13.4%**

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Return on Equity for IPPs, as estimated using the CAPM

Company	Ticker	Debt Share (2015 Q4)	Value Line Beta	Value Line Cost of Equity	Bloomberg Beta	Bloomberg Cost of Equity
Merchant Generators						
Calpine	CPN US	68.8%	1.00	10.00%	0.89	9.22%
NRG Energy	NRG US	72.3%	1.10	10.70%	1.04	10.27%
Dynegy	DYN US	70.5%	1.35	12.45%	1.02	10.11%
Talen Energy	TLN US	75.6%	-	-	1.33	12.30%
Group Average			1.15	11.05%	1.07	10.47%
Other						
AES	AES US	67.3%	1.15	11.05%	1.11	10.78%

Return on Equity

- **ROEs for project finance developments of merchant power generation provide an upper bound to the range of reasonable ROE values**
  - EPA Integrated Planning Model (2013): 16.1% ROE at a 55/45 D/E ratio and 3.8% risk free rate
  - DOE National Energy Technology Laboratory (2008): 15-20% ROE is common for low and high risk power projects, at D/E ratios of 70/30 to 50/50
  - Etsy (2003): Calpine sought 18-22% ROE, as a project finance developer circa 2002, with a D/E ratio greater than 65/35

Sources:
[1] EPA Integrated Planning Model, Chapter 8 Financial Assumptions, available: https://www.epa.gov/airmarkets/power-sector-modeling-platform-v513
[2] DOE-NETL, "Recommended Project Finance Structures for the Economic Analysis of Fossil-Based Energy Projects", September 2008.
[3] Etsy, B. and Kane, M. "Calpine Corporate: The Evolution from Project to Corporate Finance." Harvard Business School, Case Study 9-201-098.

Return on Equity

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- **Stakeholders have noted ROEs approved for various regulated entities represent varying level of financial risk (e.g., distribution and transmission)**
  - As regulated companies, these entities typically bear less financial risk and correspondingly lower ROEs; as such they may provide a lower bound assessment for risk associated with merchant power generation
    - NY PSC approved ROEs for electric distribution companies is currently ~9%
    - FERC approved ROE for NY Transco transmission projects is currently 10% (9.5% base ROE with 0.5% adder)
- **Other data points**
  - NY PSC assumed ROEs for Wind and Solar projects in the 2016 Clean Energy Standard Study that range from ~10% to 16%, assuming varying levels of project risk and long term contracts

Sources:
[1] SNL Financial reports authorized ROEs for current rate cases.
[2] New York Department of Public Service, Staff White Paper on Clean Energy Standard, Case 15-E-0302, January 25, 2016 and Cost Study (April 8, 2016), pages 225-246.
[3] New York Transco, LLC, Offer of Partial Settlement, Docket No. ER15-572-000, filed November 5, 2015

Amortization Period

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- **Choice of amortization period reflects a balance of considerations**
  - Project physical life (before major overhauls) expected to be 30 years or more
  - Many factors that create risks to cash flows, particularly over long time horizons, including policy, market, technology and economic factors

- **Current recommendation reflects balance of risks, consistent with last DCR and assumptions used in other RTOs**
  - NYISO (last DCR): 20 year amortization for F-Class machines, all zones
  - ISO-NE: assumed 20 year amortization for both combined cycle and combustion turbine machines
  - PJM: 20 year amortization its reference resource

- **<u>Recommendation</u>: Amortization period = 20 years, for all technologies and zones**