

NYISO 2015/2016 ICAP Demand Curve Reset

ICAPWG
April 25, 2016

- **Provide status update on overall ICAP Demand Curve reset (DCR) process, including methodology and inputs for annual updates**
- **Provide updates on key issues covered during previous ICAPWG meetings for annual updates, including:**
 - Review of candidate subscription services for data inputs
 - Net Energy and Ancillary Services (EAS) revenue model, including the methodology for determining the level of excess adjustment factors
- **Provide for an initial review and discussions on several DCR parameters, including**
 - Principles to develop financial parameters, including weighted average cost of capital (WACC) and including amortization period
 - Property taxes

- **Today's presentation to address follow-up issues on annual updates, and begin discussion of certain DCR parameters**
- **May ICAPWG meeting will provide further details on the DCR parameters**
- **June ICAPWG meeting will discuss the draft report, to be circulated prior to the meeting**

- **Annual Updates Parameters**
 - Review of subscription services and data input recommendations

- **Net EAS Revenue Model**
 - Status of model development
 - Methodology for determining level of excess adjustment factors

- **Financial Parameters**
 - Methodology and principles for determining WACC
 - Amortization period
 - Property tax, Depreciation, and Insurance

- **A subscription data service will be required to provide data for annual updates that are not publicly available**
 - Fuels costs (natural gas)
 - Emission prices (NO_x and SO₂)

- **Criteria for selecting data service provider:**
 - *Proven and Familiar* – used by NYISO and other energy industry participants
 - *Comprehensive* – provides both fuels and emissions data
 - *Frequency* – provides fuels data at a daily frequency
 - *Accuracy* – index based on actual trades (reported or exchange-based)
 - *Historical* – provides sufficient historical time series

- **Several data sources meet these criteria, including:**
 - SNL Financial, ICE, Platts, Ventyx Velocity Suite

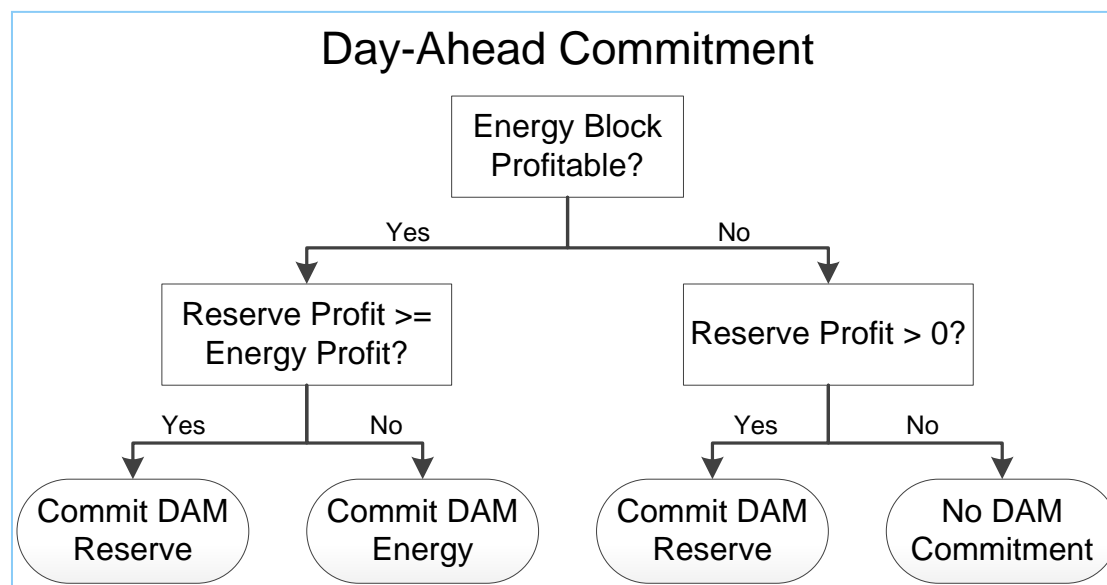
- **Recommendation: Annual updates and initial DCR values will utilize data provided by SNL Financial for natural gas costs, and NO_x and SO₂ emissions prices**
 - SNL Financial provides needed fuels and emissions cost data
 - Satisfies other established screening criteria for frequency, accuracy and historic data availability

- **SNL Financial gas cost and emission price data**
 - **Natural Gas Spot Prices**
 - Indices developed using price and volume data submitted from market participants on next-day and forward transactions
 - Reports volume weighted average price; excludes outliers that are greater than 2 standard deviations from group mean
 - **NO_x and SO₂ Allowance Prices**
 - SNL's emission prices incorporate data from Evolution Markets and TFS Energy and other market sources

Data	Regional Aggregation	Source	Unit of Analysis
<i>Energy and Reserves</i>			
DAM and RTD LBMP (energy)	Zonal	NYISO	Integrated Hourly Average
DAM and RTD reserve prices 10/30 min Non-spin	Zonal (reserve region)	NYISO	Integrated Hourly Average
<i>Fuels</i>			
Natural Gas	Zonal	SNL Financial	Daily Spot Prices
Oil (ULSD)	New York Harbor	EIA	Daily
<i>Emissions</i>			
CO ₂	Regional	RGGI Auction Clearing Price	Quarterly
NO _x	National	SNL Financial	Daily (Annual and Seasonal products)
SO ₂	National	SNL Financial	Daily (CSAPR); Annual (ARP)

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- Details on the initial net EAS revenue model logic were presented at the February 19, 2016 ICAPWG meeting
 - Analysis Group expects to post a draft net EAS revenue model for stakeholder review in May 2016

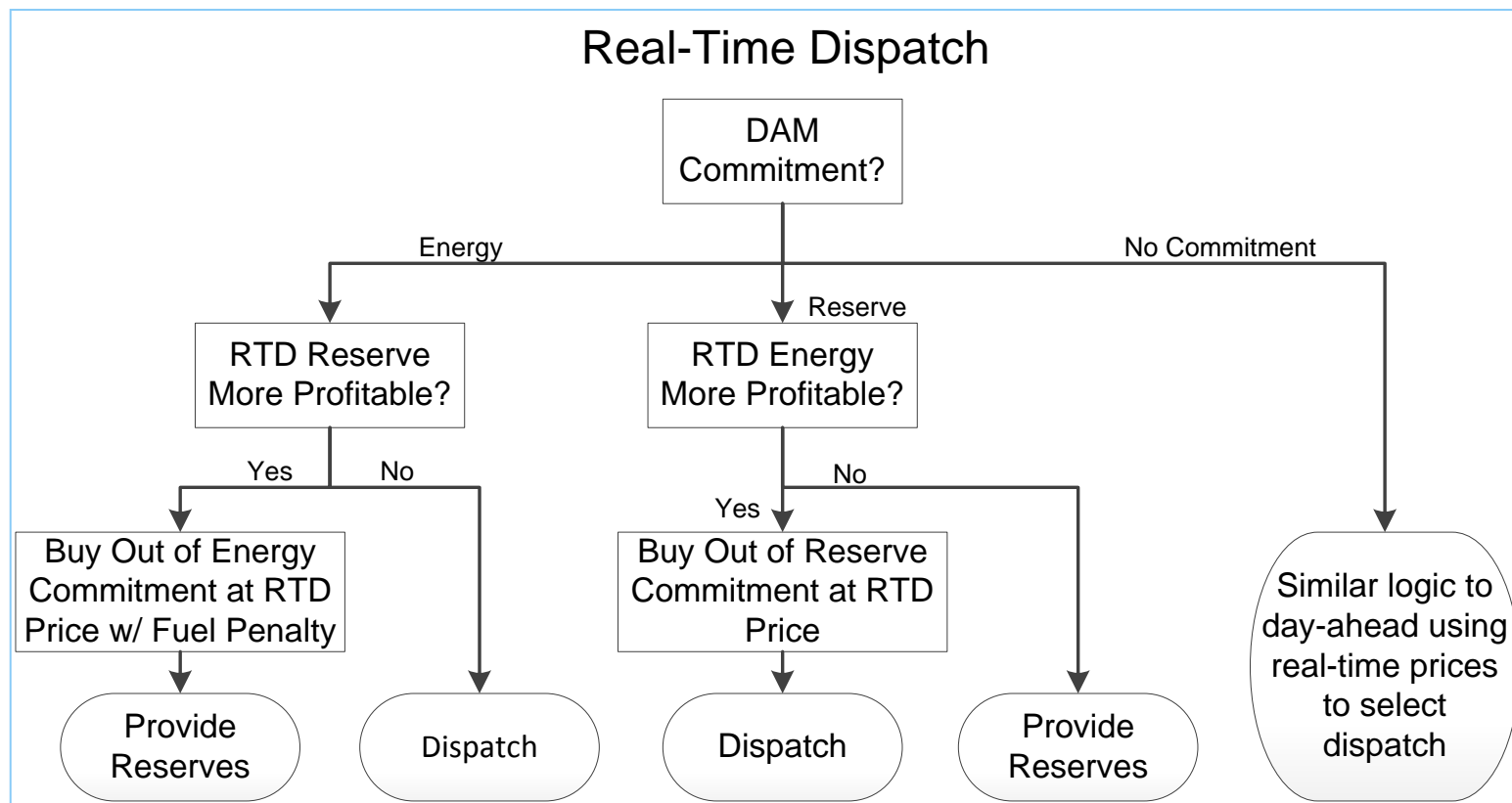


Notes:

[1] "Reserves" refers to 10-minute non-spinning reserves for technologies that can start within 10-minutes (e.g., LMS and Wartsila) and 30-minutes for others (e.g., Frame).

[2] All units are dual fuel capable and select between natural gas or ULSD depending on which leads to greater profits.

[3] Unit run-hours may be limited based on emission standards.



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- [4] RTD commitments include fuel transportation charges and intraday premium/discount included (source: Potomac 2015 State of Market Report, Table A-2)

- **Analysis Group and the NYISO will contract with GE to conduct GE-MAPS modeling runs necessary to estimate the level of excess adjustment factors (“LOE-AF”)**
- **LOE-AF will be developed for preliminary and final reports:**
 - Preliminary report (Phase I) will reflect CARIS I database
 - Final report (Phase II) will reflect CARIS II database (and finalized 2016 Gold Book, if appropriate)
 - At-criterion level of excess will reflect 2016 Gold Book peak load forecast and 2016/17 IRM/LCR values plus 200 MW

- **LOE-AF will be the ratio of (1) LBMP at tariff-prescribed excess conditions and (2) LBMP under currently projected resource conditions based on applicable CARIS database**
 - Final GE-MAPS runs at tariff-prescribed excess conditions modeled assuming increases in load and assuming CARIS II projected supply resources
 - Zonal LOE-AF will be developed using forward looking modeling runs over the DCR period (i.e., the average of values for 2017 to 2021 period)
- **Adjustment Factors will be calculated by zone, by month, and time differentiated based on MAPS analysis**
 - Factors will likely represent on-peak, high on-peak, and off-peak periods, where high on-peak is likely to vary seasonally (summer and winter)

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- **Financial parameters are assumptions about how the project is financed that affect how installed capital costs are spread (“levelized”) across time – the parameters include:**
 - Weighted Average Cost of Capital (“WACC”), which depends on:
 - Cost of debt
 - Return on Equity (“ROE”)
 - Capital structure: Debt-to-Equity Ratio
 - Amortization period

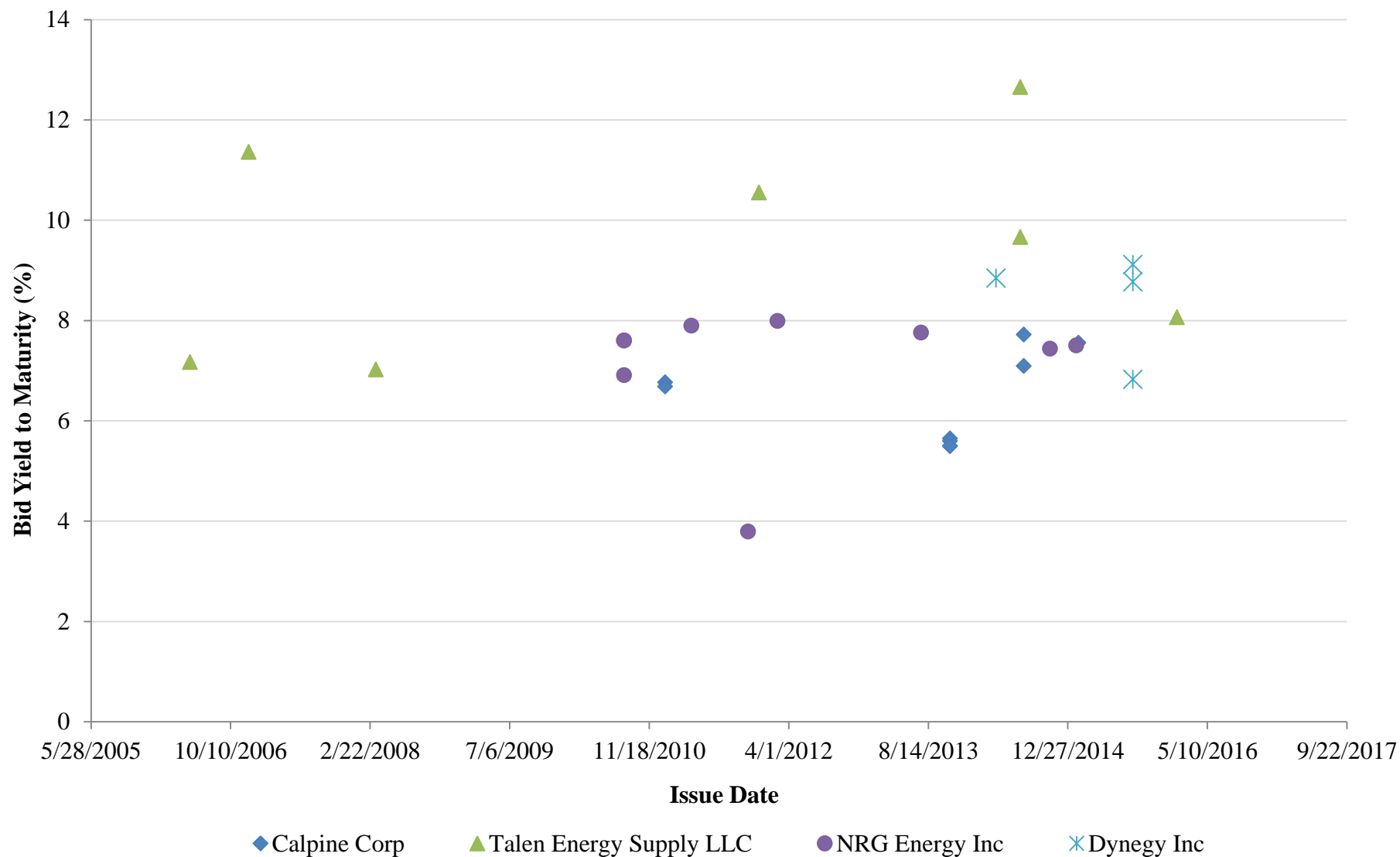


- **Financial parameters should reflect project specific risk for a merchant developer based on investor expectations**
 - Financial parameters are inter-related, requiring internal consistency
- **Financial parameters should be developed in consideration of available relevant market data and information:**
 - Market data on the cost of debt and equity (e.g., for publicly traded independent power producers):
 - Cost of debt (e.g., from recent issuances)
 - Return on equity (as measured, e.g., using the CAPM)
 - Information on cost of debt and equity from others sources (e.g., literature and equity analyst opinions) and for various financing approaches (e.g., project finance)
- **The following slides provide additional detail on individual components of the WACC for certain publicly traded independent power producers (IPP)**
 - Includes detailed review of Calpine, NRG, Dynegy, and Talen
- **Analysis Group is continuing to develop other information, including project finance cost of debt and ROE**

- **The cost of debt reflects lender's willingness to loan funds, given the likelihood of repayment by debtor (i.e., default risk) and other investment options**

- **Current cost of debt ranges from 7% - 9% based recent independent power producer issuances and generic corporate bond yield indexes**
 - Reflects current IPP ratings of BB to B
 - Generic corporate bond yields have increased since 2013, and, in particular, increased within the last year

Cost of Debt for Independent Power Producers



Source: Bloomberg, L.P.

Corporate Bond Yield Indices, 2012-2016



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

- **The return on equity reflects investor's willingness to take on equity stake in ownership**
 - Includes risk-free and risk premium components (e.g., CAPM)
- **Balance multiple considerations in developing appropriate ROE**
 - Available data on ROEs and appropriate interpretation given differences between portfolio of corporate assets and proxy plant project (i.e., merchant plant within NYCA)
 - Other financial parameters, including debt-to-equity ratio and amortization period
 - Financing approach (e.g., balance sheet versus project finance)
 - Other risk factors
- **Data on ROEs**
 - Independent power producers (next slide)
 - ROE for independent power producer *companies* reflects portfolio of assets with varied risks, including long- term contracts; company and project-specific ROE can differ
 - Project finance – sources indicate higher ROEs ranging from 16 to 20 percent (over different past periods)
 - Typically reflects different capital structure (i.e., debt to equity ratio)

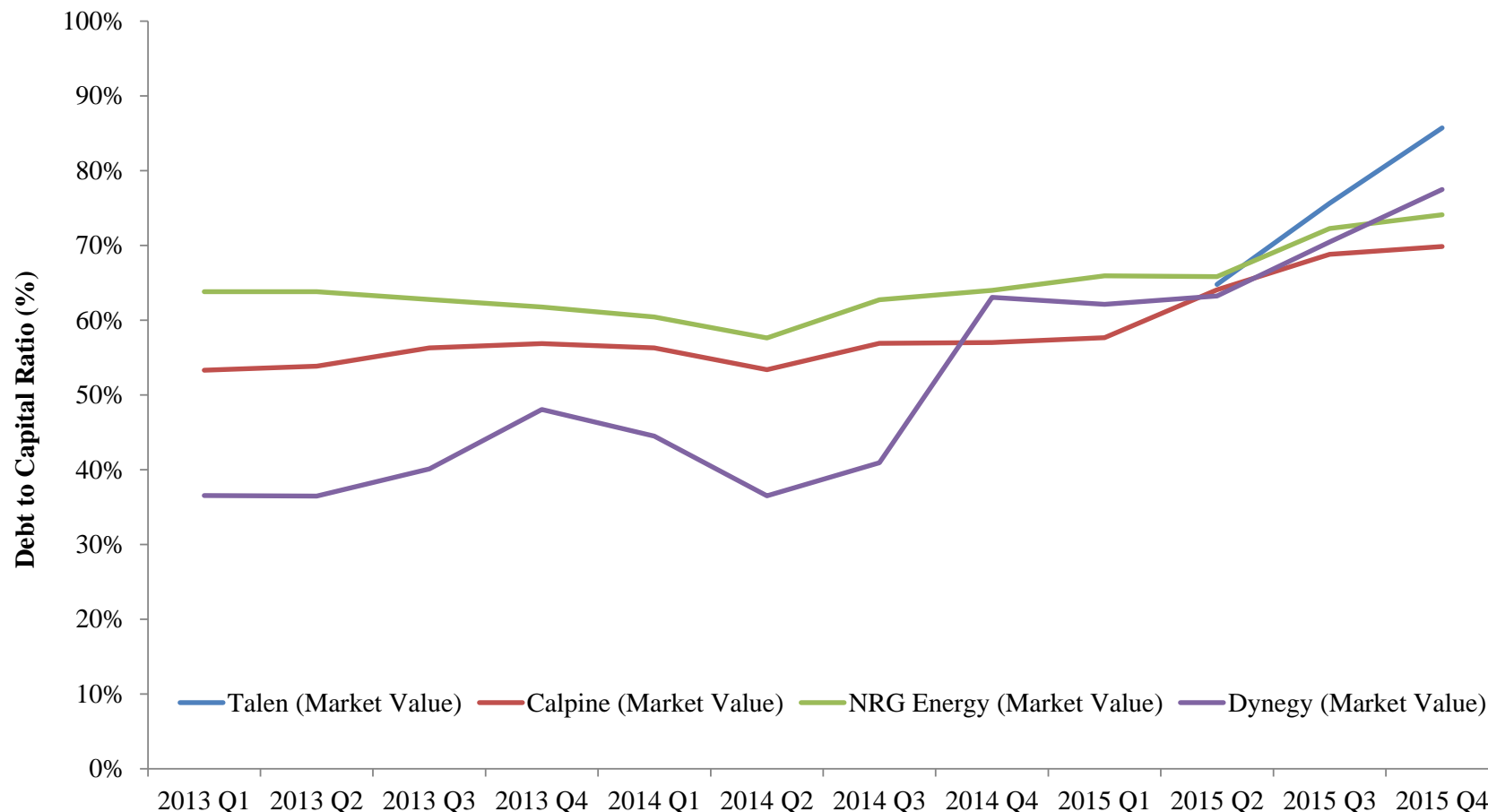
- **Independent Power Producer companies:** Current average ROE for IPPs of about 11% based on CAPM (which differs from a project specific ROE)

Company	Ticker	Debt to Capital	Debt to Equity	Value Line	Cost of Equity
		Ratio (2015)	Ratio (2015)		
		Q4	Q4	Beta	(2)
Generators					
Calpine	CPN US	68.8%	2.21	1.00	10.00%
NRG Energy	NRG US	72.3%	2.61	1.10	10.70%
Dynegy	DYN US	70.5%	2.39	1.35	12.45%
Talen Energy	TLN US	75.6%	3.10	-	-
Group Average				1.15	11.05%
Integrated Utilities/Distribution Utilities					
ConEd	ED US	40.7%	0.69	0.55	6.85%
CH Energy Group	CHG US	-	-	-	-
Northern Utilities Group	0834011D US	-	-	-	-
The Southern Company	SO US	39.2%	0.65	0.60	7.20%
Xcel Energy	XEL US	42.4%	0.74	0.65	7.55%
Group Average				0.60	7.20%

Notes: Assumes a 7% market premium (Ibbotson, 2015) and a 3% risk free rate based on 30 year treasury yield.

- **Capital structure is the mix of financing (debt and equity) used to develop a project (or finance a company)**
- **Current debt to equity ratios are high relative to historical levels**
 - Corporate debt levels may not be indicative of project-level capital structure
- **Merchant developers have indicated a willingness and desire 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)

Debt to Capital Ratio, Independent Power Producers, 2013-2015



Note:

[1] The market value of equity is calculated as enterprise value minus cash and near cash items.

Source:

[1] Bloomberg, L.P.

- **Amortization period is the period of time assumed by investors for recovery of upfront investment costs (i.e., the break-even point)**

- **Appropriate amortization period should be consistent with ROE and capital structure and reflect multiple factors, including:**
 - Potential to earn energy and ancillary service revenues over the physical life of the plant;
 - Risk of differences between actual and forecast net EAS over the long-run, due to changes in load forecast, market entry, or environmental regulations; and
 - Risks not factored into analysis (technology change, technology degradation, environmental regulations, etc.)

■ **New York City**

- Class 4 property tax rate is 10.656% (previously, 10.288%), with 45% assessment Ratio, for effective tax rate of 4.8%
- 15 year tax abatement* remains in effect for the peaking unit

■ **Payment in Lieu of Taxes (PILOT)**

- Generators are able to negotiate site specific, individual tax agreements
- 2013 DCR assumed a 0.75% tax rate based on review of PILOT agreements
 - Industrial Development Authority data is currently under review; initial analysis suggests a similar tax rate
- Recent PILOTs also support assumption that the tax rate may apply for the full amortization period
 - CPV Valley Energy Center negotiated a 20 year PILOT

* Industrial and Commercial Property Tax Abatement is effective through March 1, 2019 (Exemption Administration Manual Part 2, Section 4.06 – RPTL 489)

- **Property Tax:** Preliminary recommendation is to maintain current PILOT rates, including NYC tax abatement measure

	2013 DCR	Current DCR (Proposed)	Notes
New York City	4.63%	4.80%	Includes 15 year exemption
Long Island	0.75%	0.75%	PILOT, assumed effective for full amortization period
Lower Hudson Valley	0.75%	0.75%	
NYCA	0.75%	0.75%	

- **Insurance:** Lummus recommends that a 0.6% insurance ratio remains appropriate, consistent with 2013 DCR and ISO-NE
- **Depreciation:** Peaking units will be depreciated using the 15 year Modified Accelerated Cost Recovery (MACR) schedule, consistent with IRS Publication 946
 - Combined Cycle technology will be depreciated with 20 year MACR

- **Soliciting additional stakeholder feedback**
 - Today, at this meeting
 - Written comments to DEckels@nyiso.com

- **May ICAPWG meeting**
 - Provide further details on the DCR parameters, including recommended financial assumptions
 - Including updated peaking unit technology costs reflecting financial assumptions