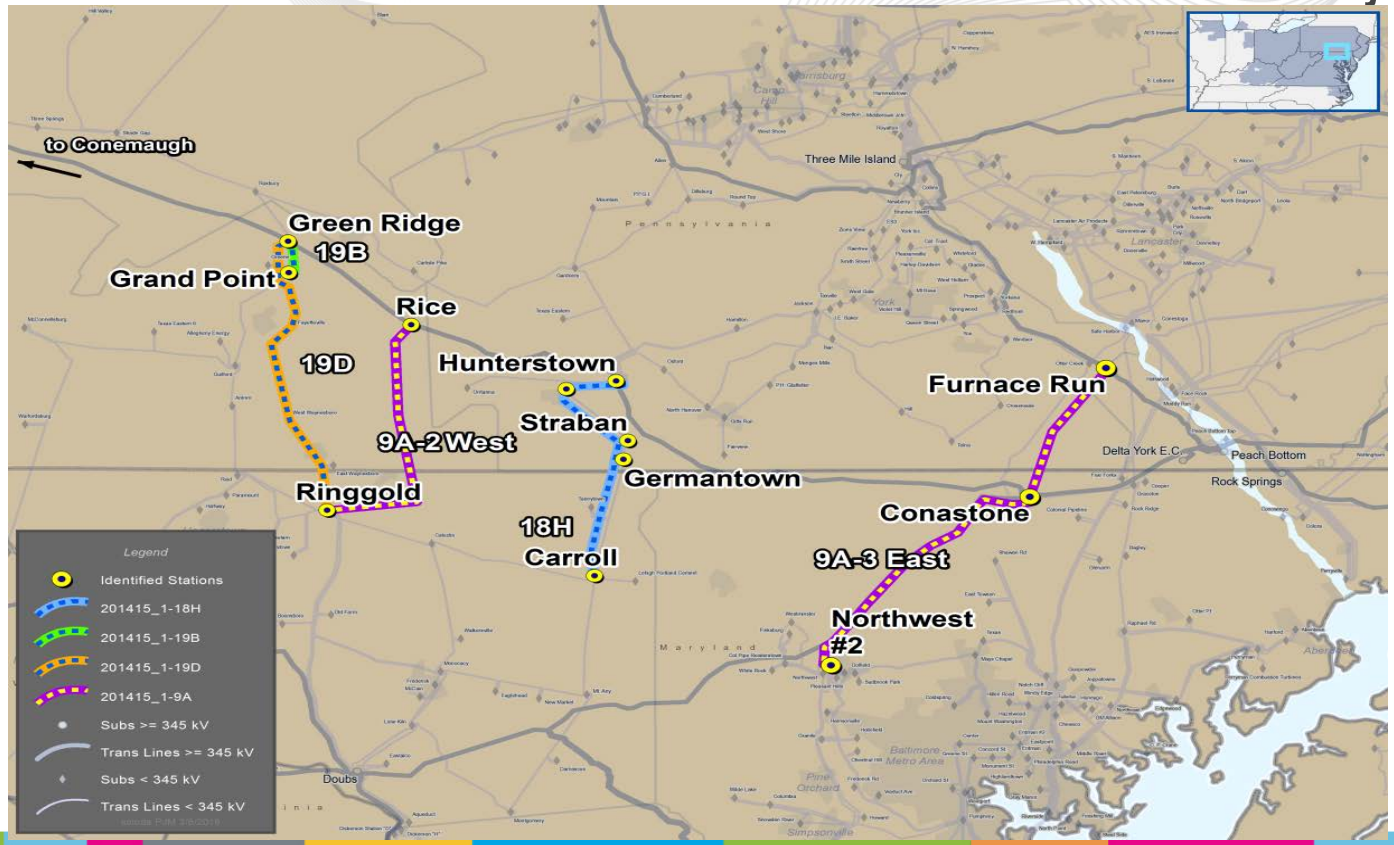
Transmission Expansion Advisory Committee
Market Efficiency Update

May 12, 2016

Market Efficiency 2014/15 Long Term Proposal Window Update

AP-South Combination Projects



AP-South Combination Project Results: Updated Cost

	9A (Without Capacitors)		Combo 18H(Modified)+(9A-3 East)	Combo 19B+(9A-3 East)		Combo 19D+(9A-3 East)	
Project Cost	$281.60		$220.50	$192.16		$252.99	
Reliability Upgrades Description	Ringgold Substation: Expand station to 230kV double breaker/double bus and replace 230/138 kV transformers.	$14.13	Reliability analysis not performed	Grand Point Substation: Expand station to breaker and half.	$5.28	Ringgold Substation: Expand station to 230kV double breaker/double bus and replace 230/138 kV transformers.	$14.13
	Ringgold-Catoctin: Upgrade terminal equipment, rebuild/reconductor	$44.89				Ringgold-Catoctin: Upgrade terminal equipment, rebuild/reconductor	$44.89
Total Reliability Upgrades Cost	$59.03			$5.28		$59.03	
Total Cost (w Upgrd)	$340.63		$220.50	$197.44		$312.02	
ISD	2020		2020	2020		2020	
Delta in AEP-DOM L/O BED-BLA	($4)		($5)	($4)		($7)	
Delta in AP SOUTH L/O BED-BLA	($49)		($19)	($26)		($31)	
Delta in Total Interfaces Cong	($54)		($24)	($31)		($38)	
Delta in Total PJM Cong	($83)		($41)	($44)		($61)	
B/C Ratio	2.48		2.46	2.39		1.97	
Delta in Gross Load Payment	($30)		($9)	($33)		($13)	
Delta in Production Cost	($31)		($16)	($17)		($25)	
Comments			Minor congestion increase on Graceton – Bagley (BGE)	Minor congestion increase on Graceton – Bagley (BGE)		Minor congestion increase on Graceton – Bagley (BGE)	

*Deltas represent totals of 2019 and 2022 study years

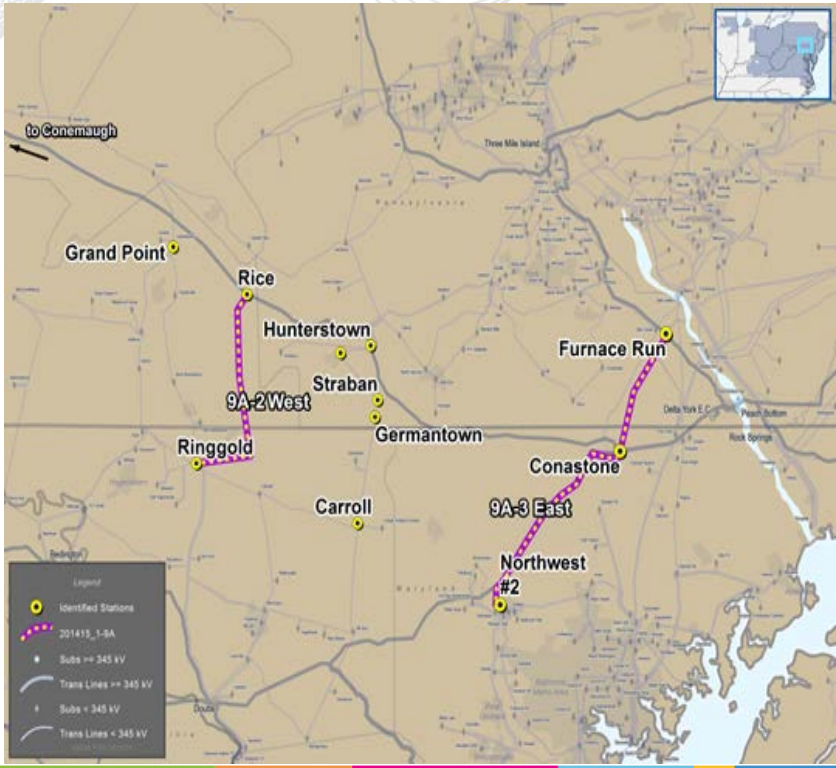
Project 9A (Without Capacitors) provides the most benefits

- Highest B/C ratio
- Most AP-South congestion savings
- Most total PJM congestion savings
- Most production cost savings

Final AP-South Market Efficiency Project Recommendation

Project 9A (Without Capacitors)

- Tap the Conemaugh - Hunterstown 500 kV line and build new 230 kV double circuit line between Rice and Ringgold.
- Build new 230 kV double circuit line between Furnace Run and Conastone.
- Rebuild of the Conastone - Northwest 230 kV line.
- Replace the Ringgold #3 and #4 transformers with 230/138 kV autotransformers
- Ringgold bus reconfiguration
- Reconductor of Ringgold-Catoctin 138 kV.
- Cost ($M): $340.6
- IS Date: 2020
- Recommendation to next PJM Board.



Recommended Project Designated Entities

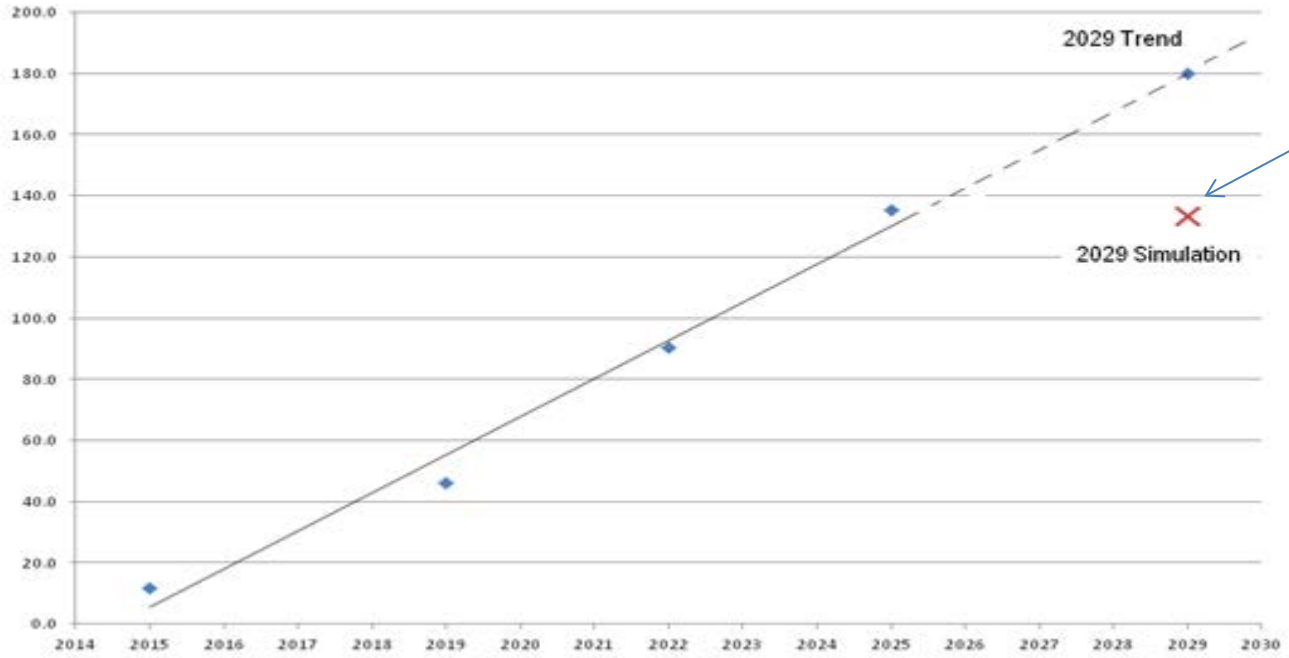
Component Description	Designated Entity
Project 9A (Without Capacitors)	
Tap the Conemaugh - Hunterstown 500 kV line & create new Rice 500 kV & 230 kV stations. Install two 500/230 kV transformers.	Transource Energy, LLC
Build new 230 kV double circuit line between Rice and Ringgold.	Transource Energy, LLC
Tap the Peach Bottom – TMI 500 kV line & create new Furnace Run 500 kV & 230 kV stations. Install two 500/230 kV transformers.	Transource Energy, LLC
Build new 230 kV double circuit line between Furnace Run and Conastone.	Transource Energy, LLC
Rebuild the Conastone - Northwest 230 kV line.	Baltimore Gas & Electric
Additional Reliability Upgrades	
Replace the Ringgold #3 and #4 230/138 kV transformers.	Allegheny Power
Ringgold bus reconfiguration.	Allegheny Power
Rebuild/reconductor the Ringgold-Catoctin 138 kV & replace terminal equipment at both ends of the circuit.	Allegheny Power

Posted Constructability Whitepaper

- The draft 2014/15 Long-term proposal window constructability white paper has been posted
- The white paper summarizes the independent cost review for several projects with costs exceeding $50 million
  - http://www.pjm.com/~/media/committees-groups/committees/teac/20160512/20160512-2014-2015-long-term-proposal-window-independent-cost-review-white-paper.ashx

Trend for Net Load Benefits of Recommended Project 9A (Without Capacitors)

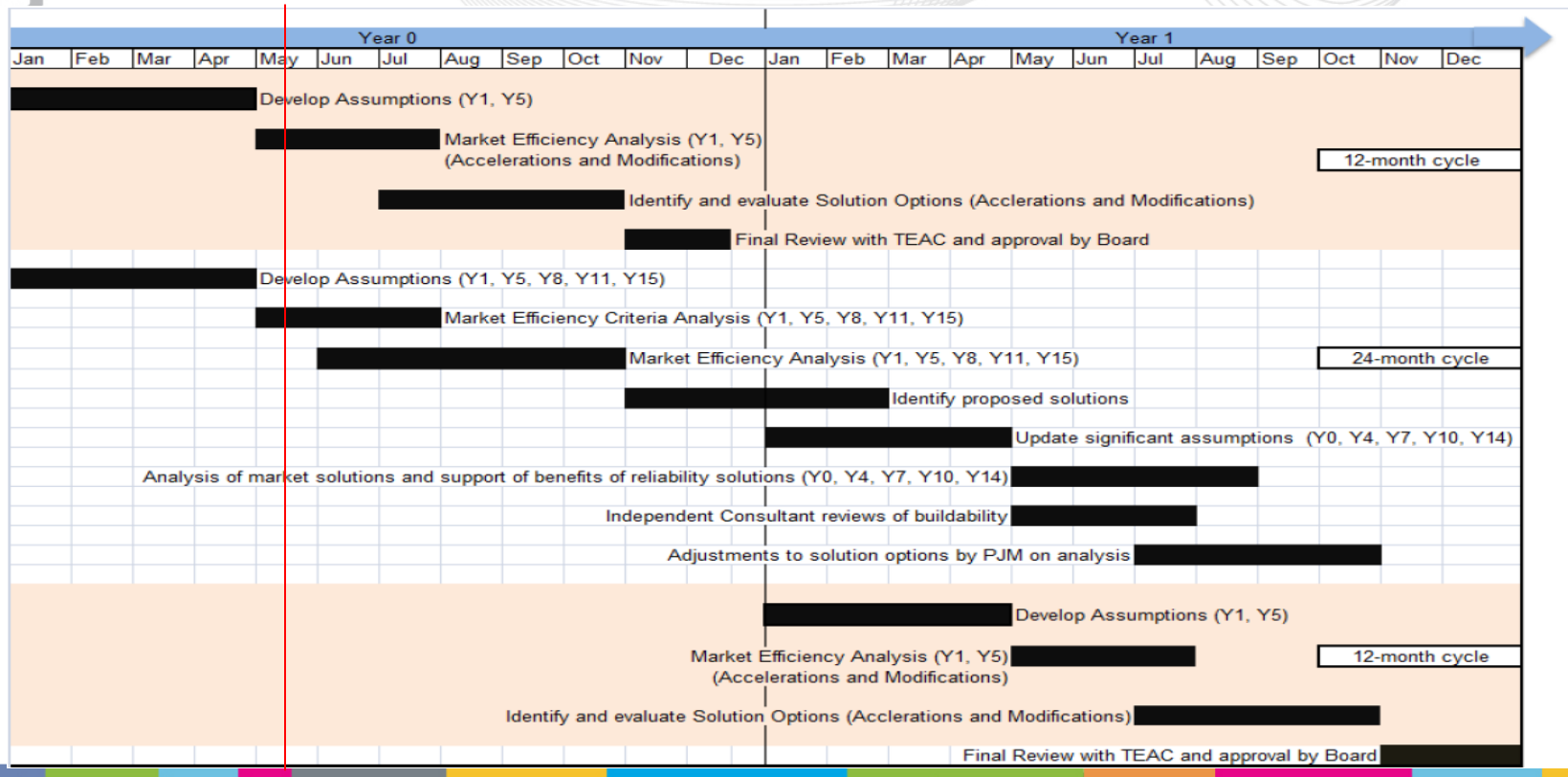
Market Efficiency Project 9A (Without Capacitors)
Trend of Net Load Benefits



Not used in Actual B/C Evaluation

Market Efficiency 2016/17 Long Term Proposal Window Update

Market Efficiency Timeline



2016-2017 24-Month Market Efficiency Cycle Timeline

- Long Term proposal window: November 2016 - February 2017
- Analysis of proposed solutions: March 2017 - November 2017
- Determination of Final projects: December 2017

Next Steps

Finalize Market Efficiency Inputs	June
Board Review of Market Efficiency Input Assumptions	June
Market Efficiency Preliminary Results:	July
Post Market Efficiency Base Scenarios:	July
Stakeholder feedback on model:	August-September
PJM review for acceleration candidates:	August-October
Proposal window opens:	November

Questions?

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