A large, white, lattice-structured transmission tower stands prominently in the center of the slide, set against a clear, bright blue sky. Several high-voltage power lines extend from the tower towards the top corners of the frame. The overall image has a clean, professional aesthetic.

Transmission Expansion Advisory Committee Meeting

2011 Market Efficiency Analysis Results

August 4, 2011

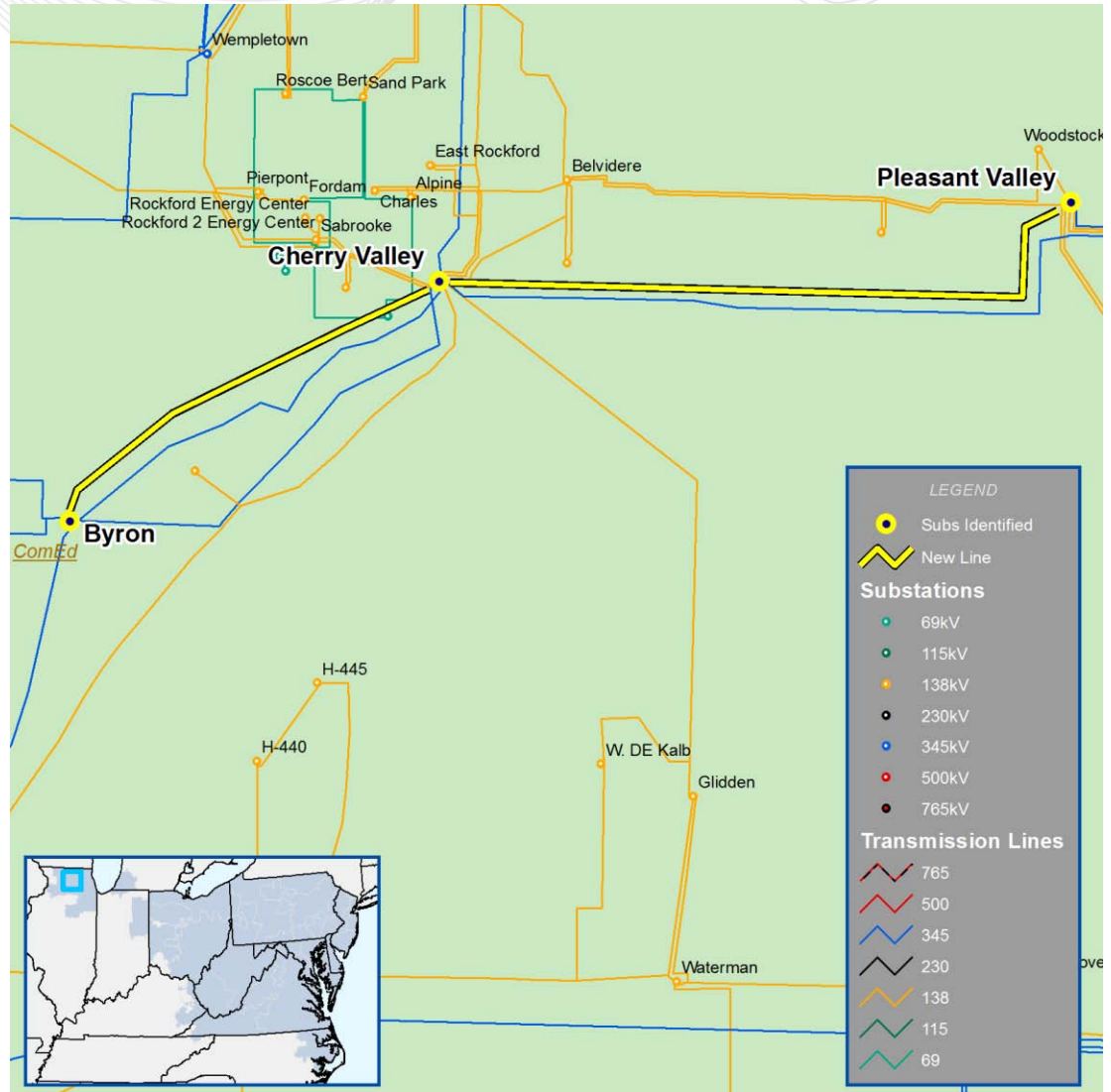
- 2011 Market Efficiency Base Analysis completed
 - Updated congestion results in Appendix A

- 2010 project reviews completed
 - COMED Area
 - PPL, METED, and PENELEC Area
 - Dominion and AEP Areas

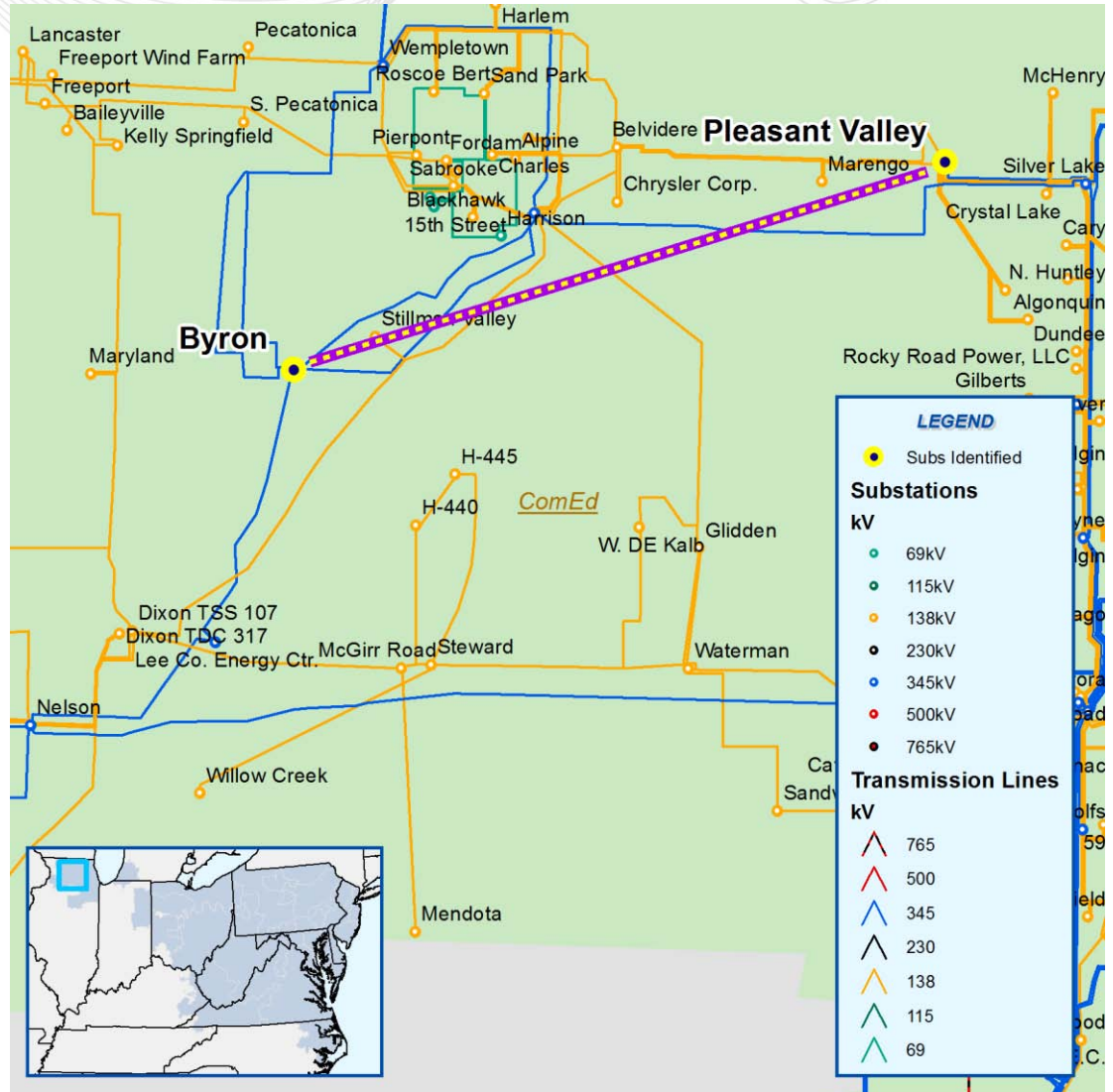
Market Efficiency Projects

COMED AREA

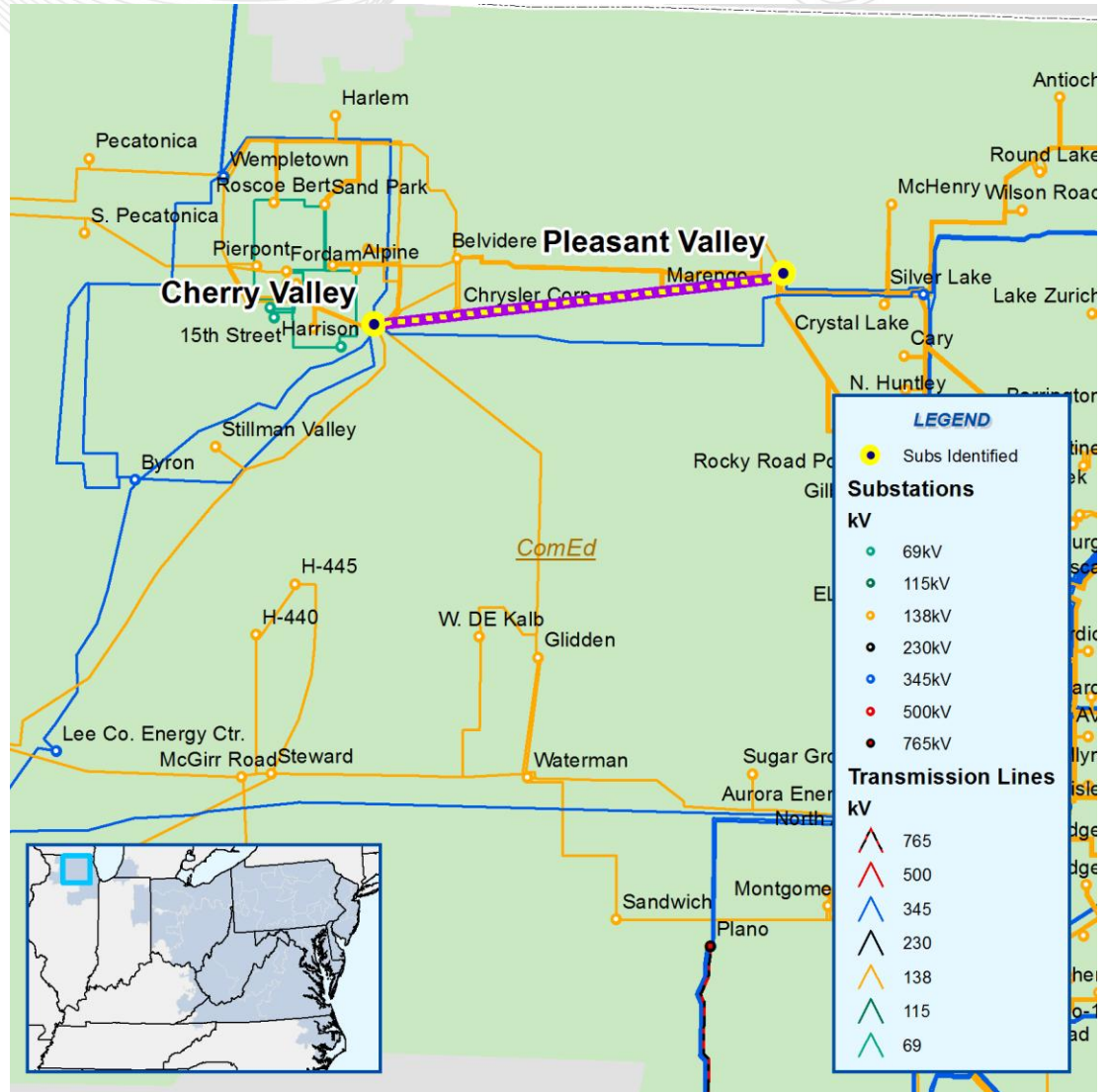
- BCP Transmission Project submitted by LS Power for new single 345 kV line from Byron to Cherry Valley to Pleasant Valley.
- Expected ISD: 6/1/2016
- LS Power estimated project Costs: \$112.5 million
- 2011 Analysis Results:
 - Benefit/Cost ratio= .75
 - $.75 < 1.25$ - Fail



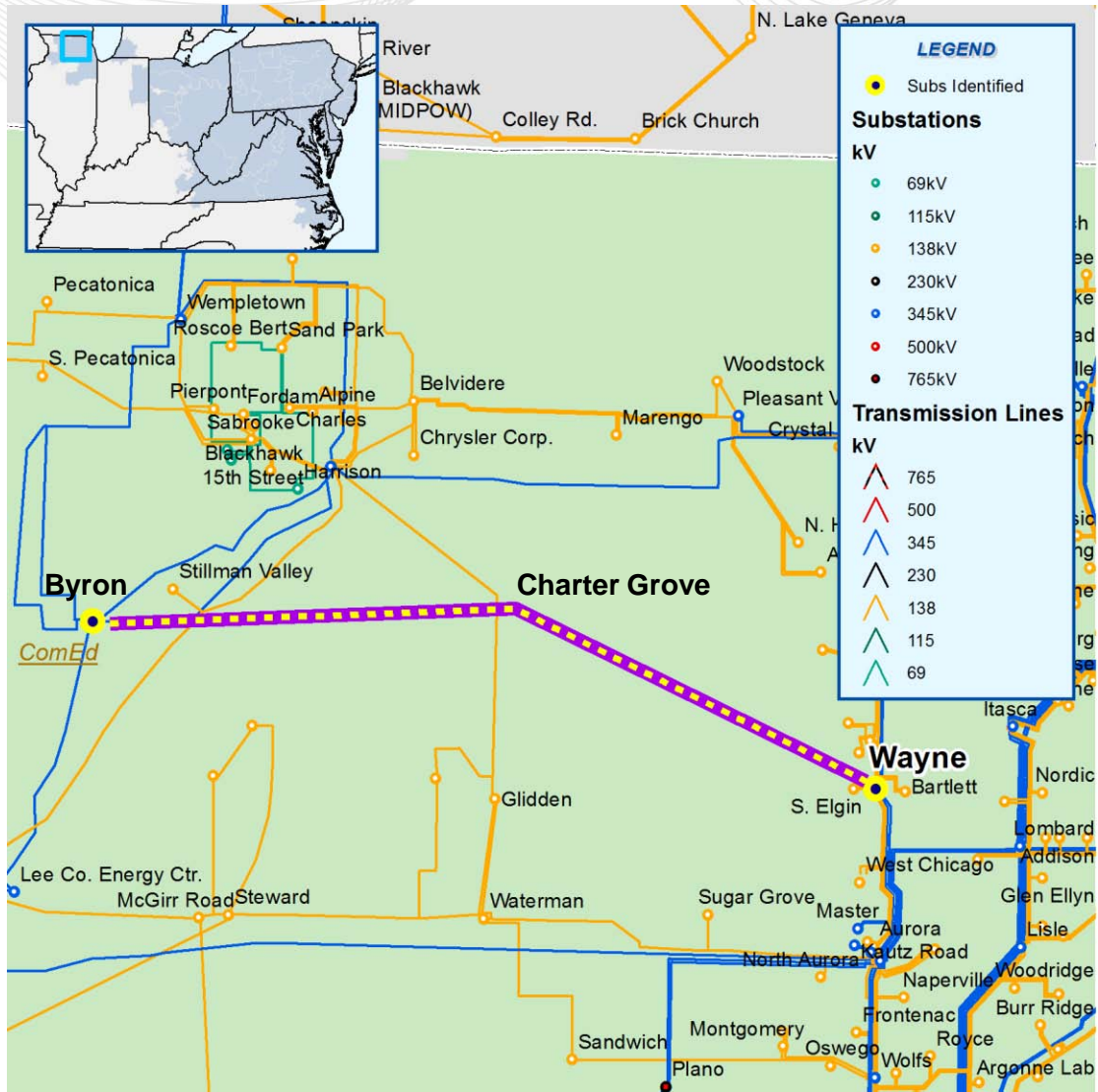
- Variation of BCP Transmission Project submitted by LS Power for new single 345 kV line from Byron to Pleasant Valley.
- Expected ISD: 6/1/2016
- LS Power estimated project Costs: \$115.4 million
- 2011 Analysis Results:
 - Benefit/Cost ratio= .96
 - $.96 < 1.25$ - Fail



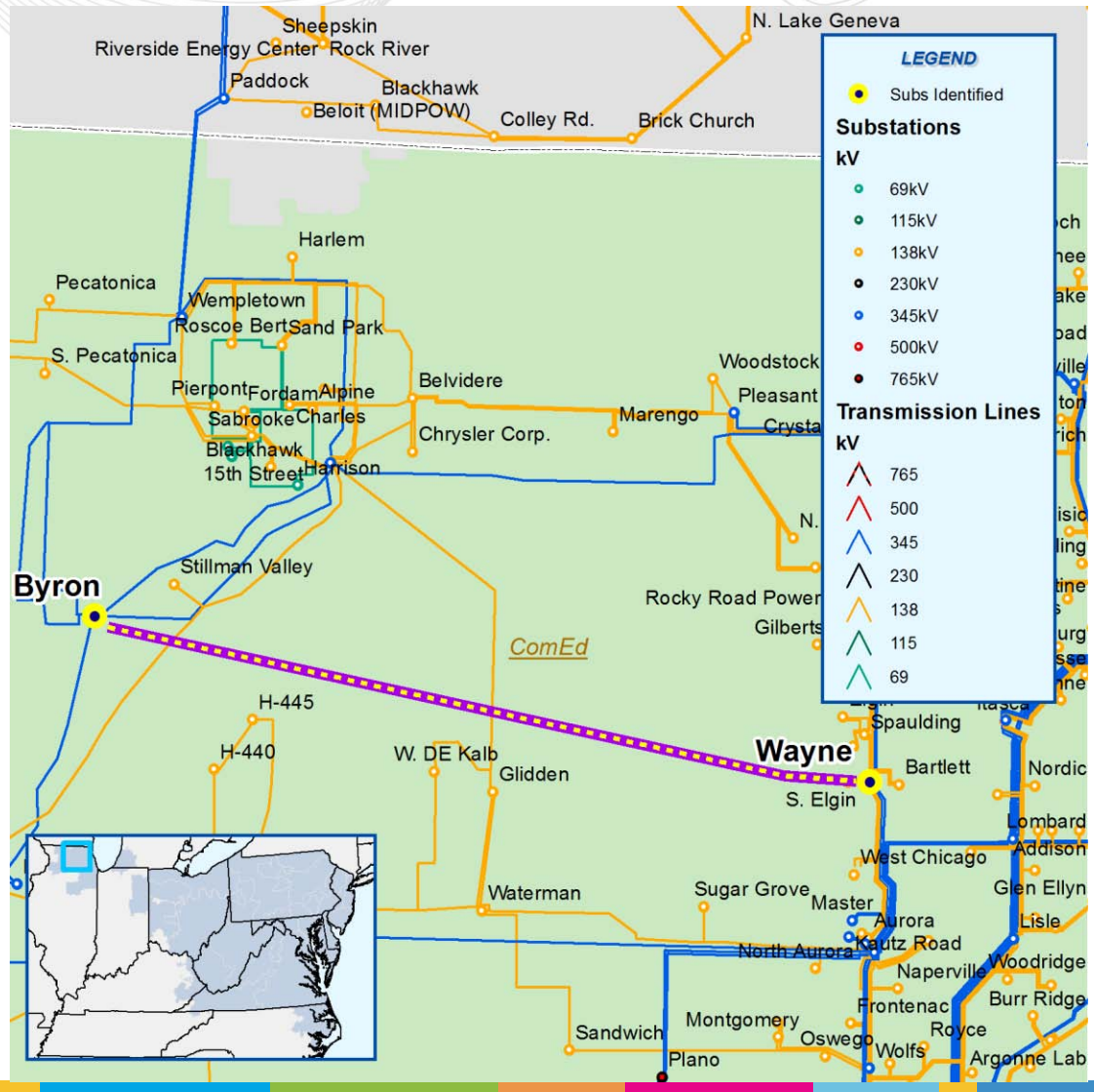
- Variation of BCP Transmission Project submitted by LS Power for new single 345 kV line from Cherry Valley to Pleasant Valley.
- Expected ISD: 6/1/2016
- LS Power estimated project Costs: \$67.5 million
- 2011 Analysis Results:
 - Benefit/Cost ratio= 2.74
 - **2.74 > 1.25 - Pass**
 - Creates congestion on Byron-Cherry Valley 345 KV ckt.



- Variation of BCP Project Submitted by COMED for new single 345 KV line from Byron–Charter Grove–Wayne with 345/138 KV transformer at new Charter Grove station that ties into the W. De Kalb-Cherry Valley 138 KV ckt.
- Expected ISD: 6/1/2016
- Estimated Costs: \$275 million
- 2011 Analysis Results:
 - Benefit/Cost ratio= .24
 - .24<1.25 - Fail



- Variation of COMED and BCP Transmission Project submitted by LS Power for new single 345 kV line from Byron - Wayne.
- Expected IS date: 6/1/2016
- LS Power estimated project Costs: \$175 million
- 2011 Analysis Results:
 - Benefit/Cost ratio= .41
 - $.41 < 1.25$ - Fail



COMED Area Proposed Projects

COMED Area Proposed Projects	Company Proposing Project	Expected ISD*	Estimated Cost* (\$ millions)	Benefit/Cost Ratio
Byron-Cherry Valley-Pleasant Valley 345 kV	LS Power	6/1/2016	112.5	0.75
Byron-Pleasant Valley 345 kV	LS Power	6/1/2016	115.4	0.96
Cherry Valley - Pleasant Valley 345 kV	LS Power	6/1/2016	67.5	2.74
Byron - Charter Grove - Wayne 345 kV, Charter Grove 345/138 kV Tx	COMED	6/1/2016	275.0	0.24
Byron - Wayne 345 kV	LS Power	6/1/2016	175.0	0.41

*Expected ISD and Estimated Costs developed by company proposing project.

- COMED Area proposed projects show less benefit in 2011 Market Efficiency Analysis
 - Lower overall congestion in 2011 vs. 2010 analysis
 - Decreased Load
 - Updated Base topology
 - Updated Fuel and Emission prices
- Next Steps
 - Independent Cost Review currently being conducted
 - Coordination with Light Load study
 - Coordination with Regional Planning Process Task Force (RPPTF) developments

Market Efficiency Projects

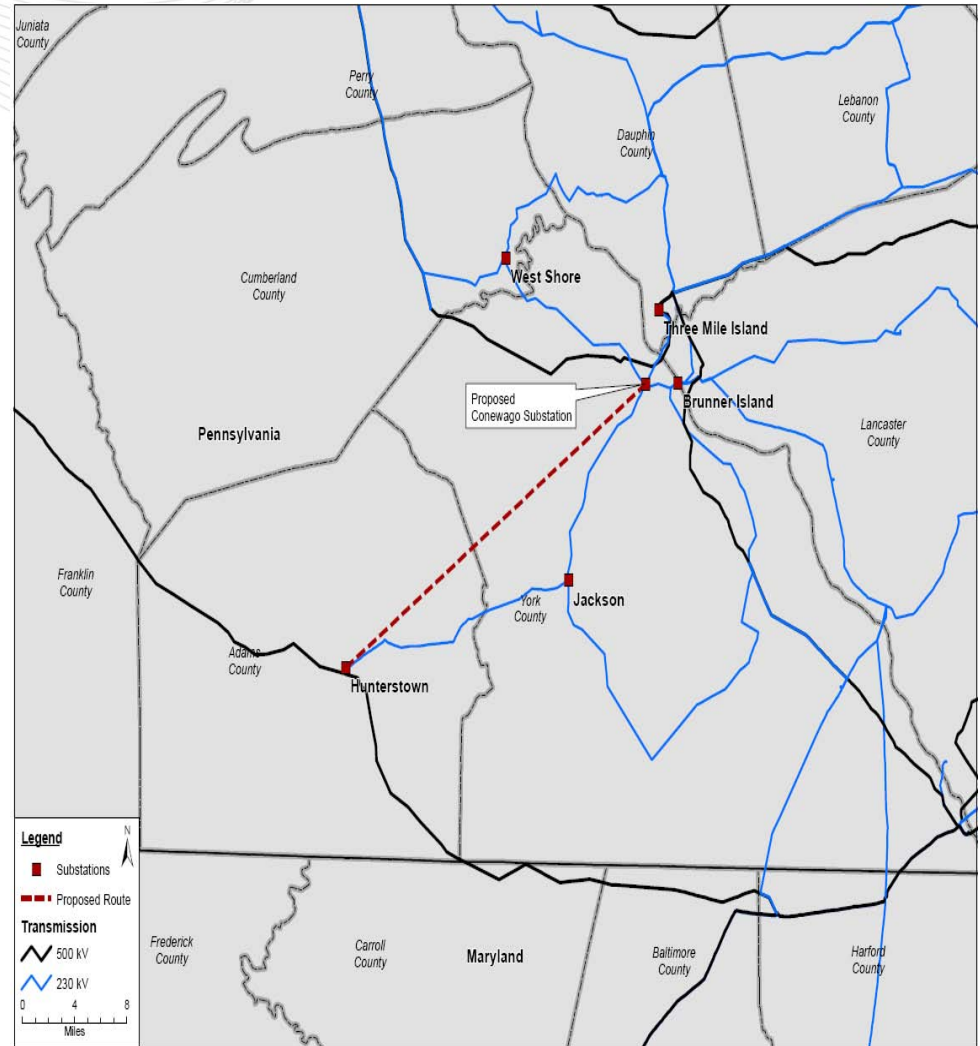
METED, PPL, PENELEC Area

- Liberty East Transmission Project submitted by LS Power:
 - New 500/230 KV TX at Hunterstown.
 - New Conewago 230 KV substation connecting Jackson-Three Mile Island 230 KV and West Shore-Brunner Island 230 KV in York County.
 - New Single or Double 230 KV circuit from Hunterstown-Conewago

- Expected ISD: 6/1/2016

- LS Power estimated project Costs.
 - \$99.4 million single circuit
 - \$134.1 million double circuit

- Results:
 - Single :
 - Benefit/Cost ratio= 1.09
 - 1.09 < 1.25 - Fail
 - Double :
 - Benefit/Cost ratio= .74
 - .74 < 1.25 - Fail



Map and route developed by LS Power for illustrative purposes only.

- Keystone-Shawville Project submitted by LS Power:
 - New 230 KV transmission line from Keystone to Shawville.
- Expected ISD: 6/1/2016
- LS Power estimated project Costs.
 - \$137.5 million
- Results:
 - Benefit/Cost ratio= .34
 - .34 < 1.25 - Fail



METED, PPL, PENELEC Area Proposed Projects

METED,PPL,PENELEC Area Proposed Projects	Company Proposing Project	Expected ISD*	Estimated Cost* (\$ millions)	Benefit/Cost Ratio
Liberty East Project Single - New Hunterstown 500 kV Tx, New single circuit Hunterstown-Conewago 230 kV line, New Conewago 230 kV substation connecting the Jackson - Three Mile Island 230 kV and West Shore - Brunner Island 230 kV transmission lines near their intersection in York County	LS Power	6/1/2016	99.4	1.09
Liberty East Project Double - Two new Hunterstown 500 kV Tx, New Double circuit Hunterstown-Conewago 230 kV line, New Conewago 230 kV substation connecting the Jackson - Three Mile Island 230 kV and West Shore - Brunner Island 230 kV transmission lines near their intersection in York County	LS Power	6/1/2016	134.1	0.74
Keystone - Shawville 230 kV	LS Power	6/1/2016	137.5	0.34

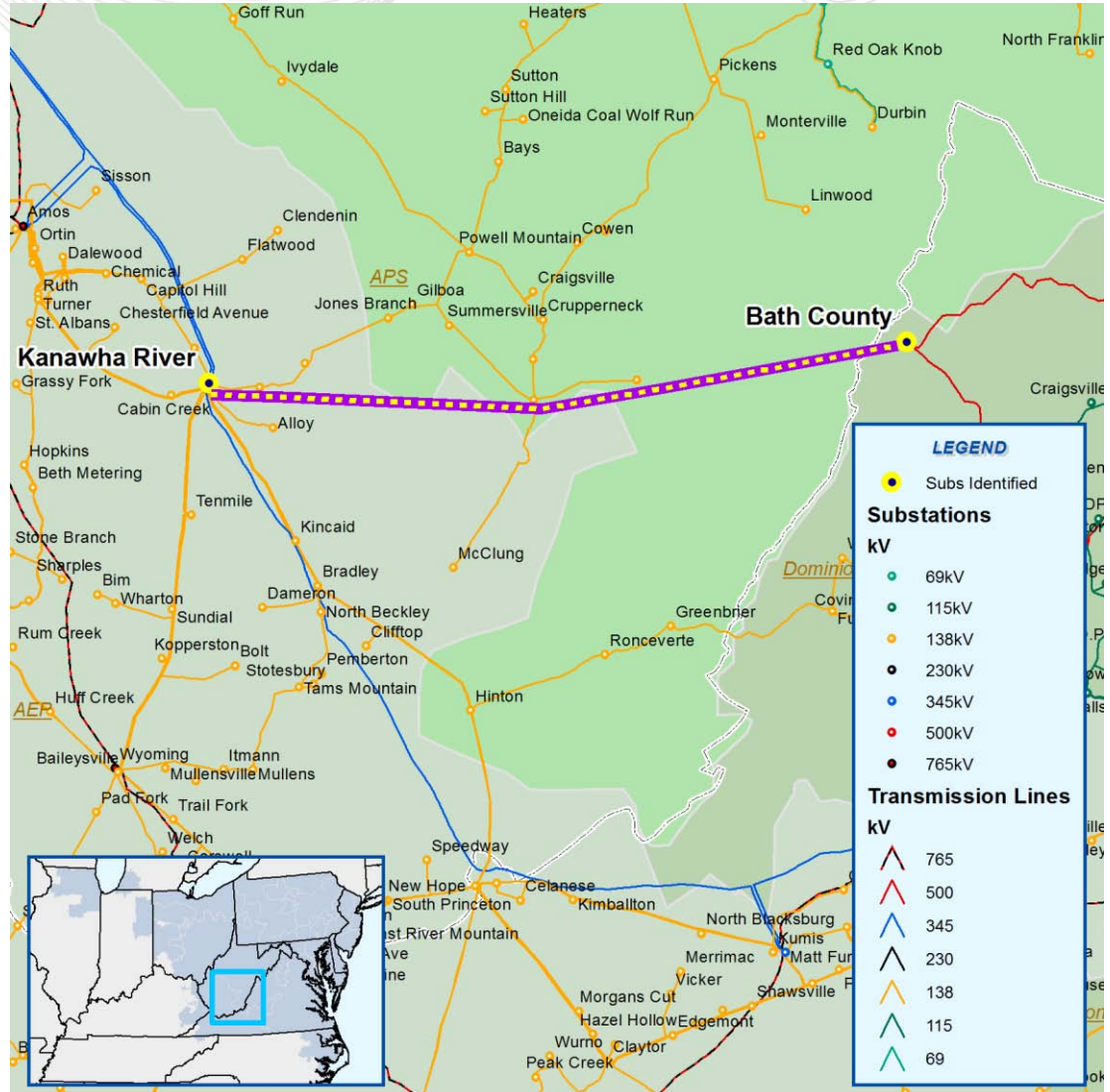
*Expected ISD and Estimated Costs developed by company proposing project.

- Liberty East single and double configurations do not pass 1.25 Benefit/Cost threshold with 2011 Analysis
 - Lower overall congestion in 2011 vs. 2010 analysis
 - Decreased Load
 - Updated Base topology
 - Updated Fuel and Emission prices
 - Future new generation reduces benefit
- Next Steps
 - Independent Cost Review currently being conducted
 - Variations to be considered

Market Efficiency Projects

Dominion and AEP Area

- Kanawha River to Bath County project submitted by LS Power:
 - New Single or Double 345 KV circuit from Kanawha River to Bath County
 - New 500/345 KV TX at Bath County (Two transformers for double circuit configuration)
- Expected ISD: 6/1/2017
- LS Power estimated project Costs.
 - \$260.46 million single circuit
 - \$387.17 million double circuit
- Results:
 - Single :
 - Benefit/Cost ratio= 3.38
 - **3.38 > 1.25 - Pass**
 - Double :
 - Benefit/Cost ratio= 2.29
 - **2.29 > 1.25 - Pass**



Dominion and AEP Area Proposed Upgrades

Dominion and AEP Area Proposed Projects	Company Proposing Project	Expected ISD*	Estimated Cost* (\$ millions)	Benefit/Cost Ratio
New single circuit Kanawha River-Bath County 345 kV line, One new Bath County 500/345 kV Tx	LS Power	6/1/2017	260.46	3.38
New double circuit Kanawha River-Bath County 345 kV line, Two new Bath County 500/345 kV Tx	LS Power	6/1/2017	387.17	2.29

*Expected ISD and Estimated Costs developed by company proposing project.

- Kanawha River to Bath County single and double circuit configurations continue to pass 1.25 Benefit/Cost Market Efficiency threshold
 - Single Circuit configuration shows highest benefit/cost ratio with current cost estimates.

- Next Steps
 - Independent Cost Review currently being conducted.
 - Sensitivity Analysis to be performed
 - Bath County operation
 - Sensitivity on key input assumptions
 - Reliability Review
 - Variations to be considered

- Review results of independent cost reviews
- Sensitivity Analysis for Kanawha River – Bath County project
- Analysis on new proposed projects and variations of existing projects.

Appendix A

2011 Market Efficiency Base Congestion Results



Appendix A - Market Simulation Base Congestion Results 2011, 2014, 2017, and 2020 Load and Generation Scenarios

CONGESTION RESULTS DATA (> \$5 Million For Any Study Year)

Constraint Name	Area	Type	2011 As-Is System Topology		2015 System Topology without MAPP, PATH, Susquehanna - Roseland & Mt. Storm - Doubs Reconductor		2015 System Topology without MAPP & PATH			
			2011		2014		2017		2020	
			Frequency (Hours)	Market Congestion (\$Millions)	Frequency (Hours)	Market Congestion (\$Millions)	Frequency (Hours)	Market Congestion (\$Millions)	Frequency (Hours)	Market Congestion (\$Millions)
AP SOUTH	PJM	INTERFACE	3211	\$279.7	3118	\$358.2	2465	\$313.5	2058	\$277.9
Cloverdale 500kV to Lexington 500kV	AEP to DVP	500 kV	1045	\$125.2	1151	\$184.1	1214	\$261.5	1147	\$234.2
5004/5005	PJM	INTERFACE	2434	\$131.5	705	\$43.8	2080	\$303.1	2009	\$319.9
Black Oak - Bedington Interface	PJM	INTERFACE	148	\$24.9	811	\$163.7	988	\$274.3	735	\$186.5
EASTERN	PJM	INTERFACE	713	\$61.2	1921	\$250.5	54	\$6.8	41	\$9.9
WESTERN	PJM	INTERFACE	56	\$3.8	183	\$15.1	270	\$102.5	437	\$142.2
Krendale 138kV to Seneca 138kV	AP to FE	LINE	73	\$0.5	1915	\$25.6	2031	\$39.3	2516	\$59.4
COOPER 230kV to Peach Bottom 230kV	PECO	LINE			1006	\$15.1	984	\$27.0	1486	\$43.0
Altoona 230kV to Bear Rock 230kV	PENELEC	LINE	732	\$22.5	1	\$0.0	97	\$19.2	152	\$24.6
Lexington 500kV to Dooms 500kV	DVP	500 kV	146	\$21.0	76	\$11.5	81	\$22.0	39	\$10.1
CENTRAL	PJM	INTERFACE	146	\$2.4	182	\$6.6	153	\$10.5	451	\$43.6
Mitchell 138kV to Elrama 138kV	AP to DLCO	LINE	1917	\$10.9	1212	\$12.7	1298	\$26.5	711	\$6.4
Streator Cayuga Ridge Wind Farm 345kV to Wilton CTR 345 345kV	CE	LINE			130	\$7.9	132	\$13.0	247	\$32.6
N Meshoppen 230kV to N Meshoppen 115kV	PENELEC	Transformer	177	\$0.2	2081	\$7.5	2513	\$19.9	2241	\$19.9
Clover 230kV to Clover 500kV	DVP	Transformer	148	\$3.2	245	\$9.1	343	\$19.0	85	\$4.7
Halifax (VA) 115kV to Mt Laurel 115kV	DVP	LINE			4	\$0.0	32	\$15.2	48	\$12.9
Juniata 230kV to Dauphin 230kV	PPL	LINE	158	\$20.7	34	\$4.3	5	\$0.5		
Fredericksburg 230kV to Cranes Corner 230kV	DVP	LINE	12	\$2.3	25	\$4.4	39	\$10.0	40	\$6.9
Streator Cayuga Ridge Wind Farm 345kV to Pontiac Midpoint 345kV	CE	LINE			58	\$5.3	57	\$7.1	73	\$7.3
Bristers 500kV to Ox 500kV	DVP	500 kV							37	\$18.2
Tiltonsville 138kV to Windsor 138kV	AEP to AP	LINE	454	\$10.8	30	\$4.0	37	\$0.9	26	\$0.8
Homer City Station 345kV to Homer City Station 230kV	PENELEC	Transformer	659	\$2.7	1269	\$5.0	742	\$4.7	773	\$3.8
Dune Acres - Michigan City	PJM	INTERFACE	176	\$0.8	779	\$10.6	332	\$2.7	231	\$1.8
Bayonne 138kV to Passaic Valley Sewerage Commission 138kV	PSEG	LINE	600	\$0.4	1066	\$4.1	1847	\$5.8	1910	\$5.5
Bedington 138kV to Harmony Junction Tap 138kV	AP	LINE	27	\$12.6						
Altoona 230kV to Raystown 230kV	PENELEC	LINE	1414	\$11.8						
Meadow Brook 500kV to Meadow Brook 138kV	AP	Transformer							5	\$11.1
Pleasant View 500kV to Pleasant View 230kV	DVP	Transformer							5	\$10.4
Homer City Station 230kV to Shelocta 230kV	PENELEC	LINE	2149	\$8.4						
Grand Total				\$767.1		\$1,152.4		\$1,514.7		\$1,502.2