



PPL companies

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# 2012 Transmission Expansion Plan (TEP) – Preliminary Results

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# Agenda

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- Why Do We Need A TEP?
- TEP Methodology
- Key Assumptions
- Types of Violations Observed/Potential Solutions
- TEP Preliminary Results
  - *345 kV*
  - *161 kV*
  - *138 kV*
  - *69 kV*

# Why Do We Need a Transmission Expansion Plan?

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- Identify construction projects that are required to meet firm customer commitments for the next ten years
- Demonstrate compliance with Reliability Standards (TPL-001, TPL-002, TPL-003, and TPL-004)

# 2012 TEP Methodology

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- Models representing 2013, 2017, and 2022 summer/winter peak seasons were used in the analysis
- Modeling data drawn from external and internal sources:
  - *NERC/SERC industry models*
  - *Merit order dispatch of generation from customers*
  - *Delivery point load forecasts from customers*
  - *Other data (Impedance, Ratings, Projects, etc.)*
- Planning criteria dictates how issues are identified

# 2012 TEP Methodology (continued)

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- High level process used
  - *Power Flow software (PSS/E, MUST) automation tools perform exhaustive contingency simulations and tabulate results*
  - *Violations identified as specified by Planning Criteria, including thermal and voltage performance requirements*
  - *Solutions and mitigations identified using engineering and economic analysis to achieve robust and cost-effective resolution of potential performance violations*

# 2012 TEP Key Assumptions

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- Cane Run combined cycle unit and retirement of Cane Run units 4, 5, and 6 in Spring 2015
- 2 Duke Gallagher units retired
- Green River units 3 & 4 to be retired by 2016
- Tyrone unit 3 to be retired by 2016

# 2012 TEP Key Assumptions (continued)

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- Bluegrass generation not dispatched
- Based on delivery point load forecasts submitted by customers in December 2011
- Long term, firm transmission service sold for the next ten years is included

# Types of Violations & Potential Solutions

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- Thermal
  - *Reconductoring*
  - *Increased Maximum Operating Temperature of conductor*
  - *New lines*
  - *New substations*
- Voltage
  - *Capacitor*
  - *Reactors*
  - *New lines*
  - *New substations*



# 2012 Project Overview

Projects in 2011 TEP (1/ 1/ 12 – 12/ 31/ 21)	120
Projects Completed (or expected to be complete by EOY 2012)	35
Projects Delayed Beyond 2022 or Eliminated	73
Projects Delayed One or More Years Within 10-Year Planning Horizon	19
Projects Accelerated One or More Years Within 10-Year Planning Horizon	22
Projects Added	47
Projects in 2012 TEP (1/ 1/ 13 – 12/ 31/ 22)	98

# Major Projects Completed in 2012

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- Add 161/69 transformer at River Queen
- Replace Hardin Co-Elizabethtown 138 kV breakers and terminal equipment which increased the rating
- Increase the rating of Middletown-Trimble Co. 345 kV
- Added DOE-Grahamville (W1) 161 kV

# Major Construction

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- New Substation, New Albany 345 kV switching station
- New Substation, Matanzas 161/ 138 kV transformer required for Green River retirement
- Middletown fourth 345/ 138 kV transformer addition
- Cane Run 345/ 138 kV transformer and 345 kV tap from Paddy's West – Mill Creek

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# Questions ??