

*Meeting the Need in Southwest Connecticut:
Reliable Solutions Before the Siting Council*

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*FERC Technical Session – Hartford, Connecticut
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**Northeast
Utilities System**

Recap of October 13, 2004 Session

- At the October 13, 2004 session, we heard about:
 - The Transmission Infrastructure in Southwest Connecticut
 - Costs and Cost-Allocation Issues
 - EMF Issues
 - Technology Options
 - Reliability Issues

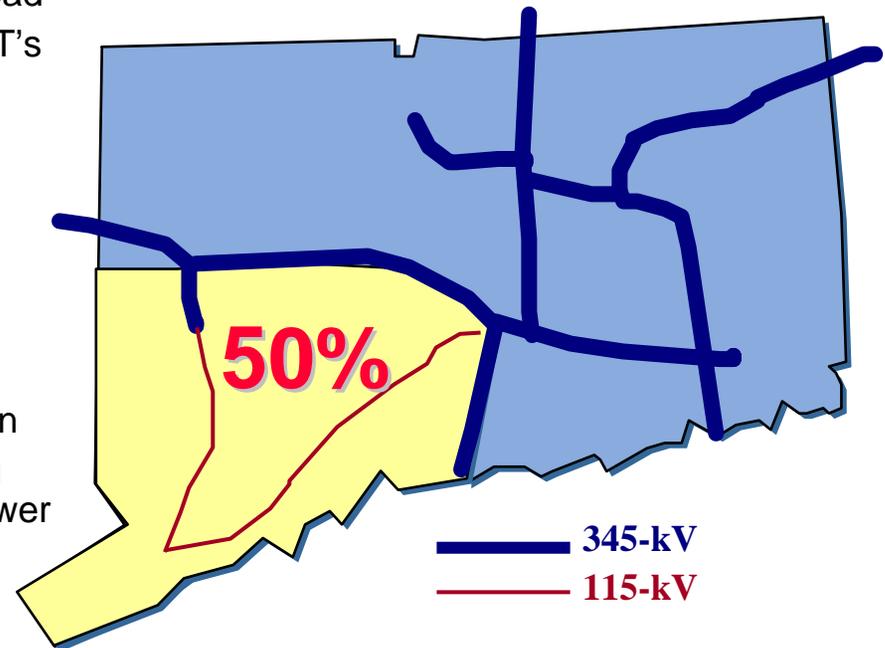
The Need: An Inadequate Transmission System

Reliability Concerns

- An inadequate system serves 50% of CT's load
- New England's 345kV system stops at SWCT's border
- Does not meet national reliability standards
- SWCT noted as a major reliability concern at federal, regional and local levels

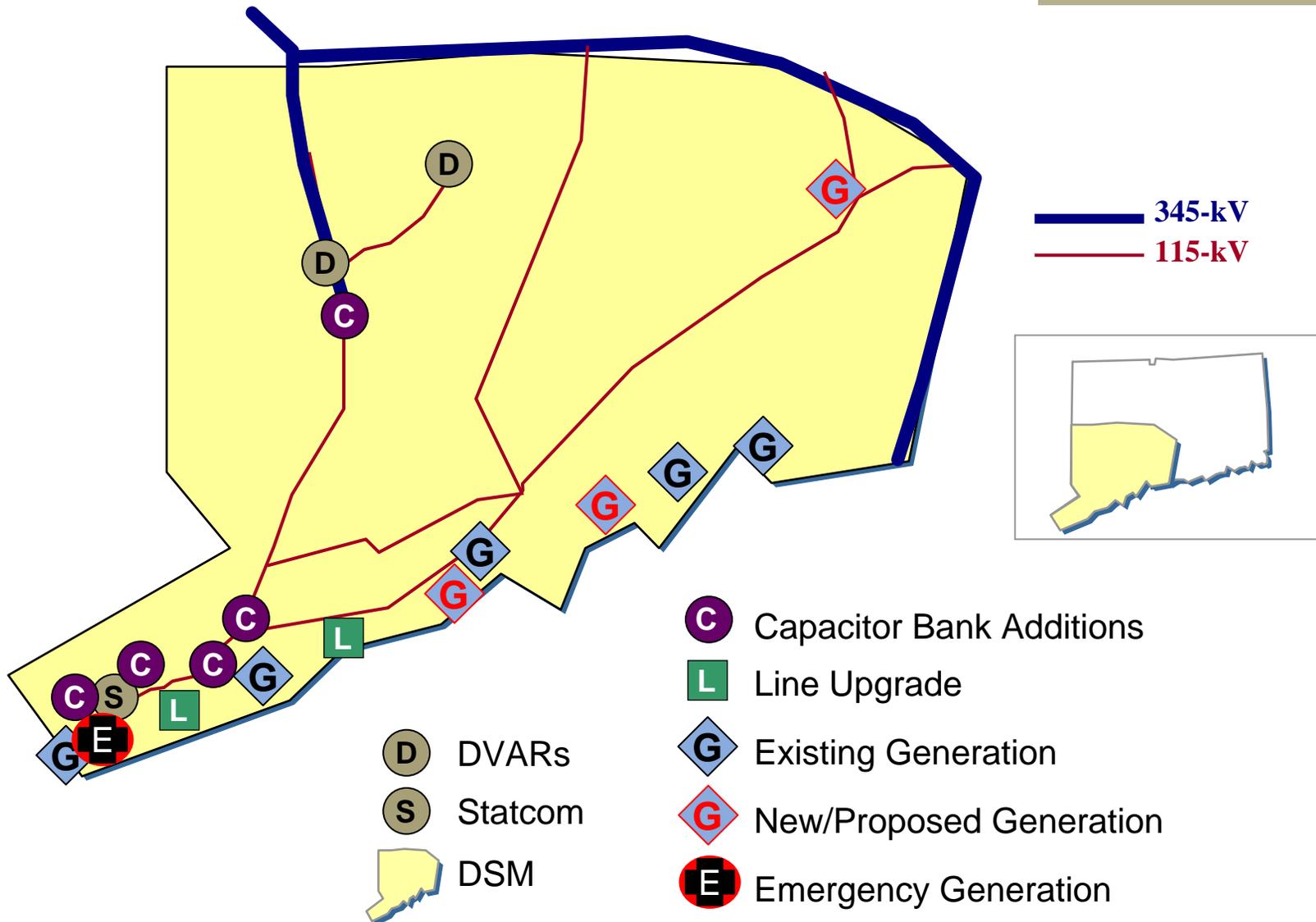
Economic Impacts

- Rising potential for wide area blackouts
- Relies on old, costly and inefficient generation
- Threat to the area's economy with increasing congestion costs and potential for market power
- Limits the potential of New England's competitive wholesale markets



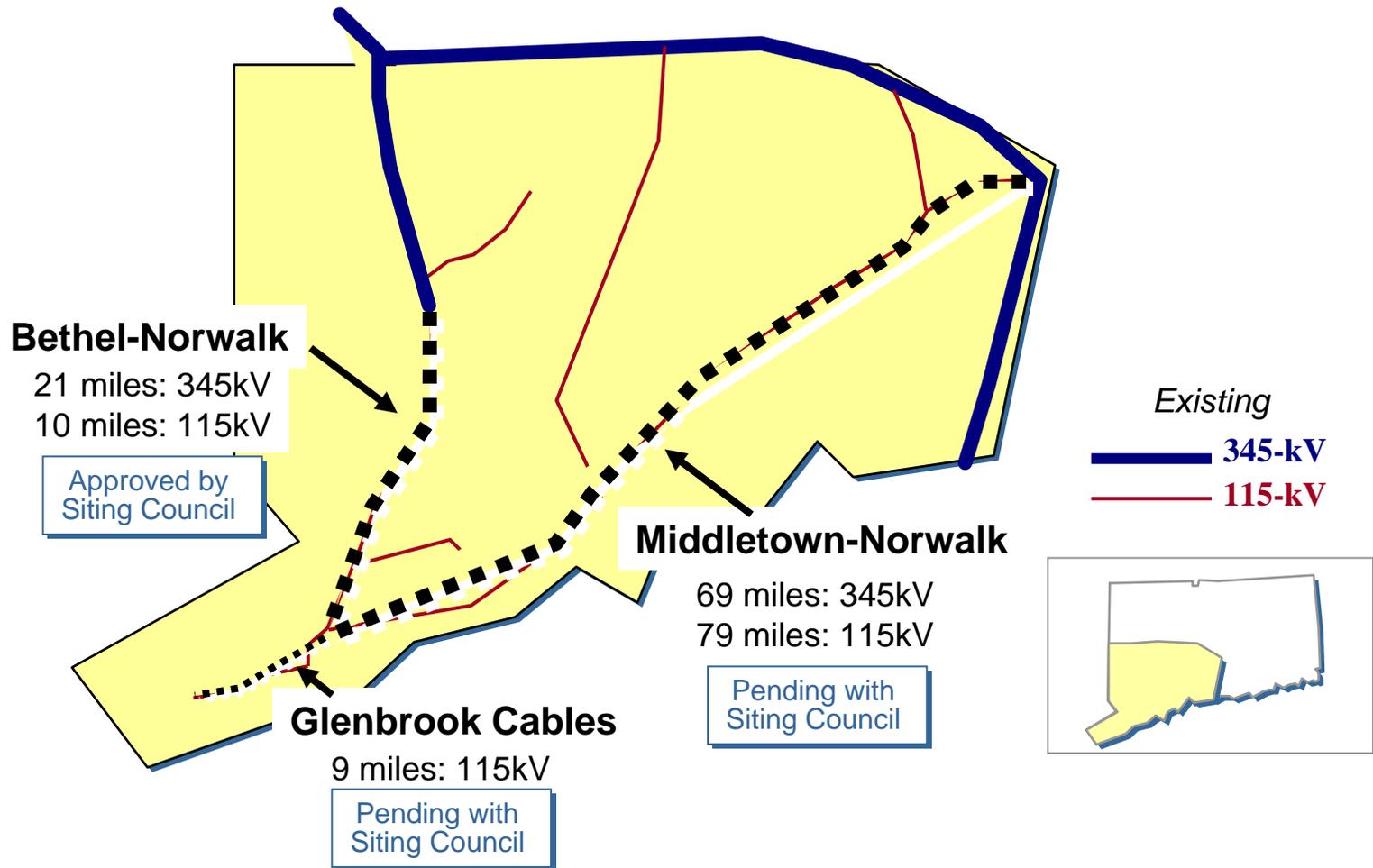
SWCT improvements have been a top priority in each of ISO-NE's last four regional transmission expansion plans.

The Alternatives and Short-Term Fixes Have Been Exhausted.



We Can No Longer Delay or Avoid Upgrading the Transmission System.

Proposed Upgrades to SWCT



Progress on Bethel-Norwalk Project Since October 13

- The CT Siting Council has approved the detailed construction plans for all but one component – a transition station (not critical path).
- CL&P has made its cost-allocation filing with ISO-NE. A decision on regional-versus-local cost allocation is expected by May 2005.
- CL&P has largely completed an agreement with CDOT on the use of state roads for underground routes.
- CL&P has gone to bid, negotiated, and is close to awarding contracts for much of the underground construction.

Progress on Bethel-Norwalk Project



The Gas Insulated Substation (GIS) work at Plumtree is 70% complete.

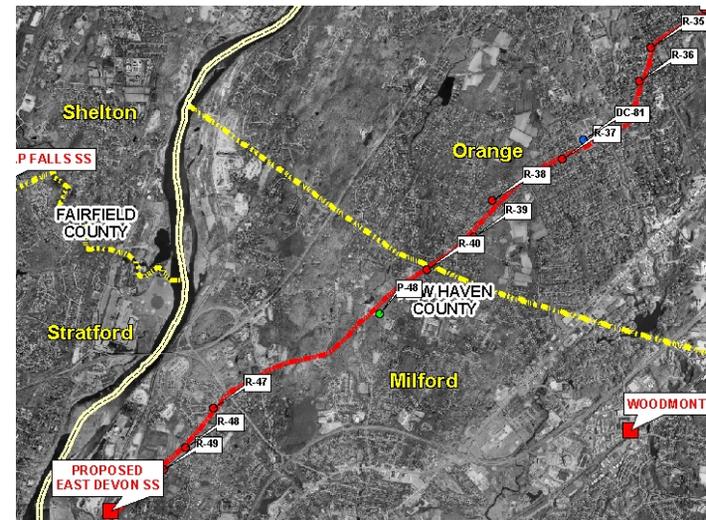
Progress on Bethel-Norwalk Project



Site preparation at Norwalk is complete.
GIS installation is on track for 1Q 2005.

Progress on Middletown-Norwalk Project Since October 13

- The Reliability & Operability Committee (ROC Group) has completed the technical studies needed to determine the maximum amount of underground that is technically feasible.
- The CT Siting Council has conducted hearings on:
 - EMF, including extensive mapping of estimates of fields at all statutory facilities using various overhead construction designs
 - The KEMA Report suggesting that, subject to further study, up to 44 miles of underground might be technically feasible
 - The VSC High-Voltage DC solution proposed by ABB
- CL&P and UI have updated their cost estimates for the 3 solutions determined by the ROC Group.



Today's Presentations

- Explain the scope of the technical investigations
(Steve Whitley, ISO-NE)
- Describe the 3 solutions that have passed careful scrutiny
(John Prete, UI)
- Compare the costs of the 3 solutions
(Anne Bartosewicz, CL&P)
- Summarize the benefits of a completed loop and the Next Steps for getting there
(Steve Whitley, ISO-NE)



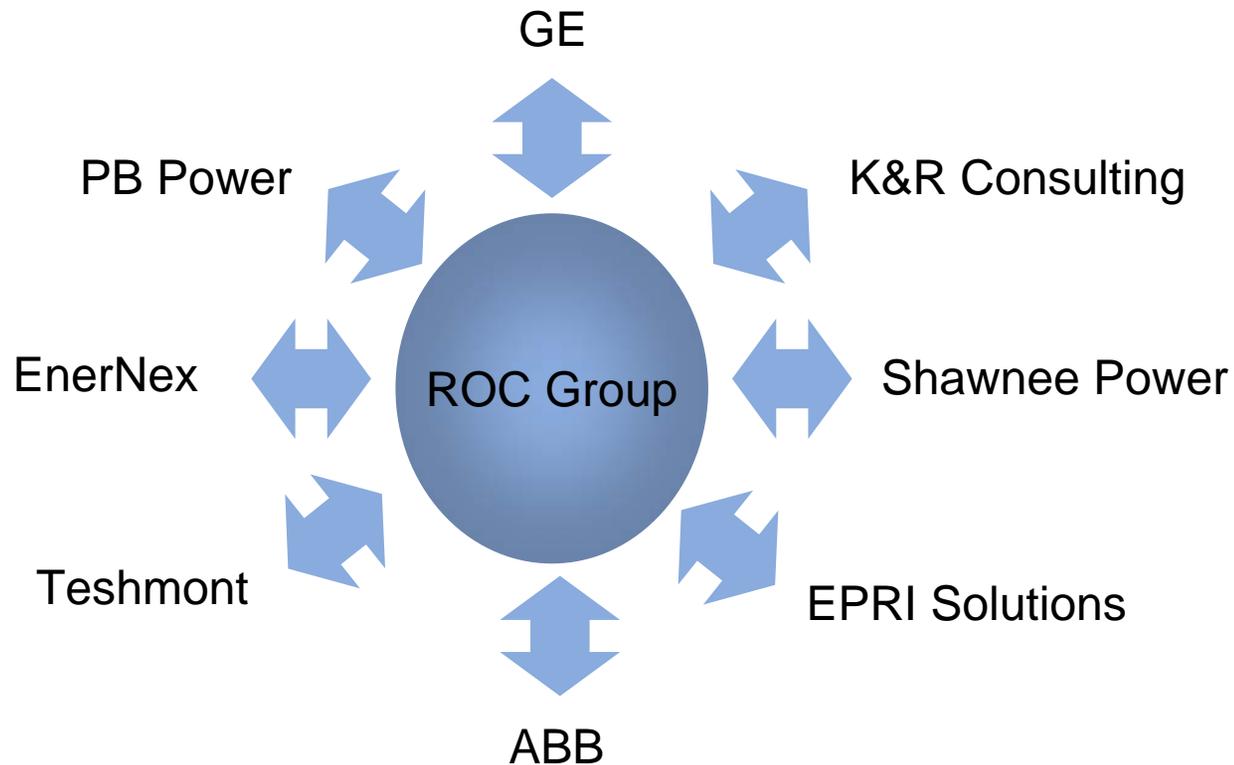
The Solutions Before the Siting Council

John J. Prete

Project Director – Middletown-Norwalk
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A Team of Experts from Around the World Analyzed Possible Solutions

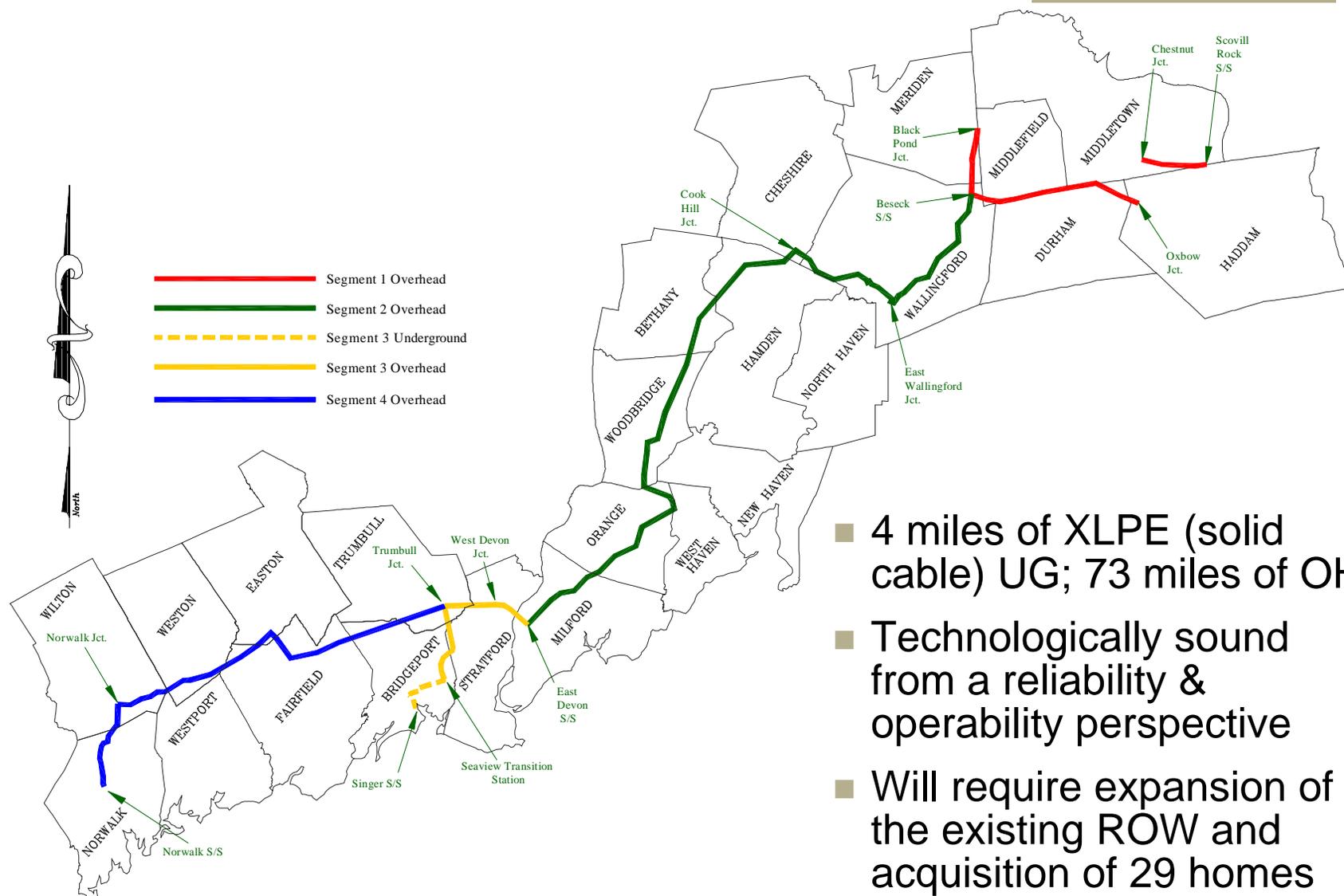


The team analyzed hundreds of electric system configurations.

Overview of the Three Reliable Solutions

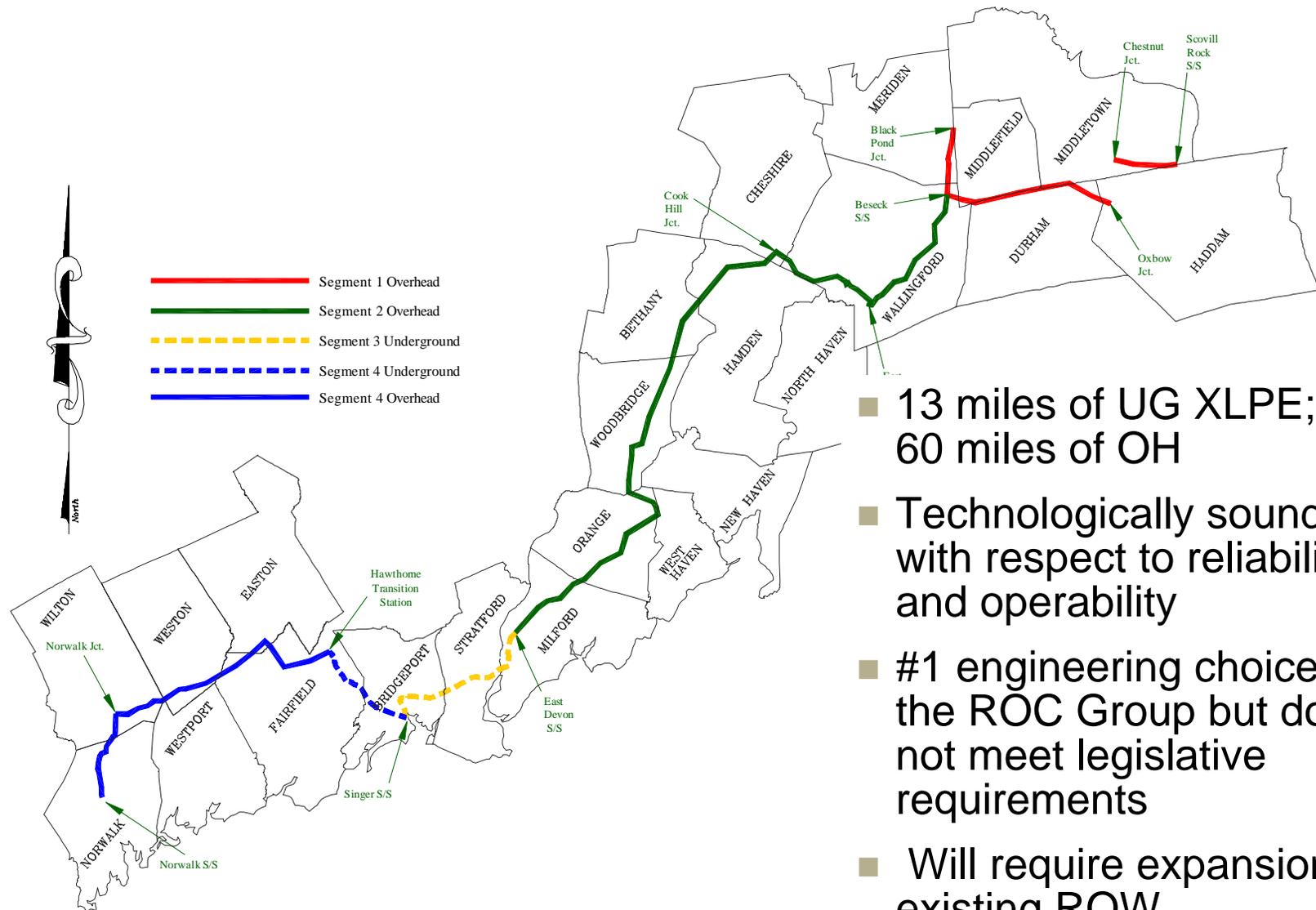
Solution	UG Miles	OH Miles	Special Conditions
4 Mile Case	4	73	Requires expansion of the right of way (ROW) & acquisition of 29 homes
13 Mile Case	13	60	#1 engineering choice of ROC; Requires expansion of the ROW
Maximum Underground Case	24	45	Meets CSC requirements & legislative intent of P.A. 04-246

The 4 Mile Case



- 4 miles of XLPE (solid cable) UG; 73 miles of OH
- Technologically sound from a reliability & operability perspective
- Will require expansion of the existing ROW and acquisition of 29 homes

The 13 Mile Case

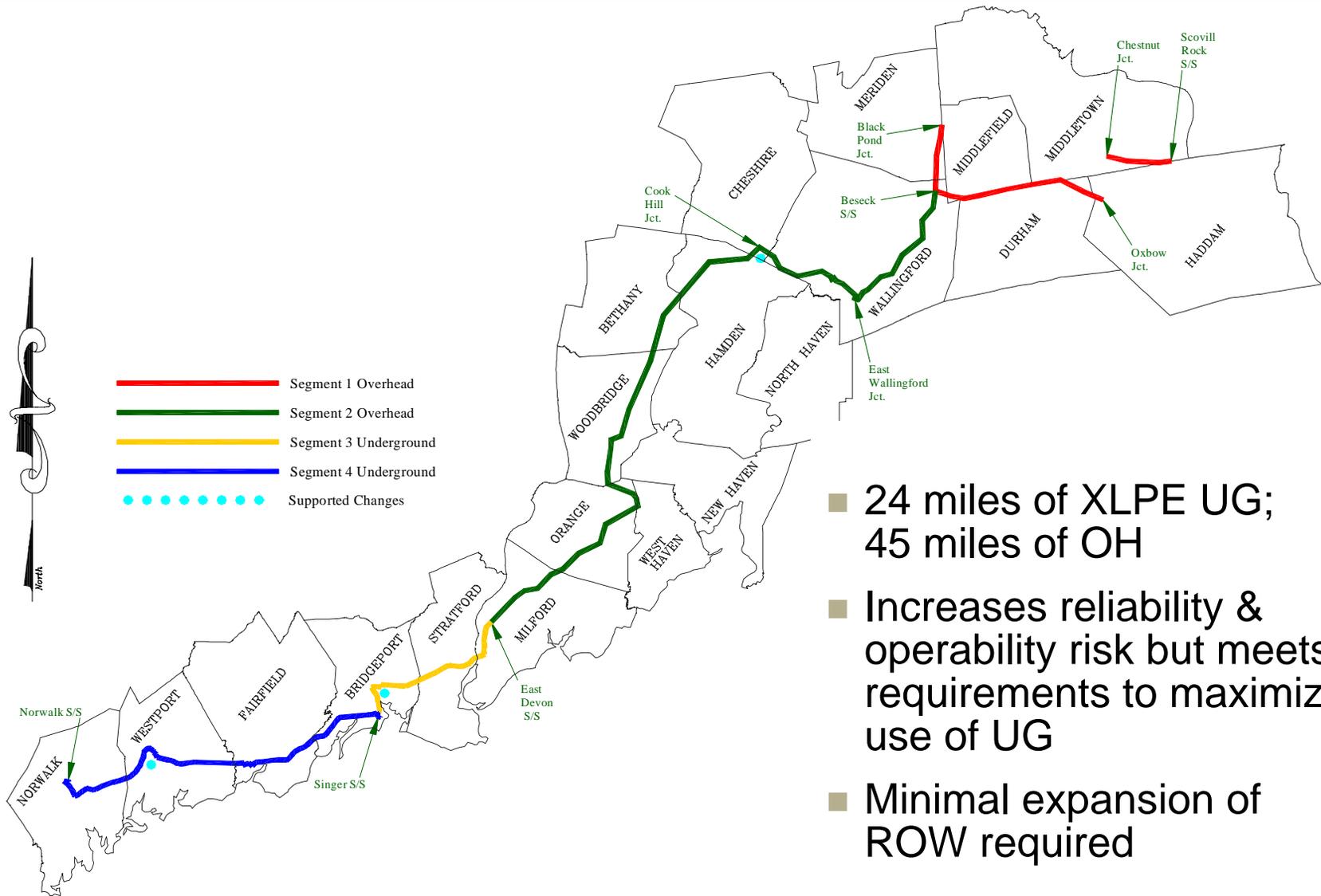


- 13 miles of UG XLPE; 60 miles of OH
- Technologically sound with respect to reliability and operability
- #1 engineering choice of the ROC Group but does not meet legislative requirements
- Will require expansion of existing ROW

To Maximize Underground, Significant System Modifications Need to Be Made

- To reduce capacitance – XLPE cable will have to be used.
- Because existing equipment in SWCT cannot tolerate the temporary overvoltages shown in many of the TNA study results, we must replace:
 - Approximately 1,200 surge arrestors at 50% of CL&P's transmission substations and all of UI's transmission substations
 - Use higher rated equipment at new substations
- More extensive changes will have to be made to remedy local area problems such as reconfiguring Rocky River Substation.
- Under light and moderate demand conditions, the Bethel-Norwalk Project will have to be operated with just one of its two 345-kV HPFF cables in service.

Maximum Underground Case



- 24 miles of XLPE UG;
45 miles of OH
- Increases reliability & operability risk but meets requirements to maximize use of UG
- Minimal expansion of ROW required

Conclusion

- The ROC Group has concluded that all three of the solutions are free of fatal technological flaws that could:
 - Impact the reliable operation of the New England transmission grid or;
 - Prevent the project from complying with Section 18.4 of the Restated NEPOOL Agreement
- “Bad News” = 24 miles is the limit
- “Good News” = We can do 24 miles



Cost Comparison of the Solutions

Anne Bartosewicz

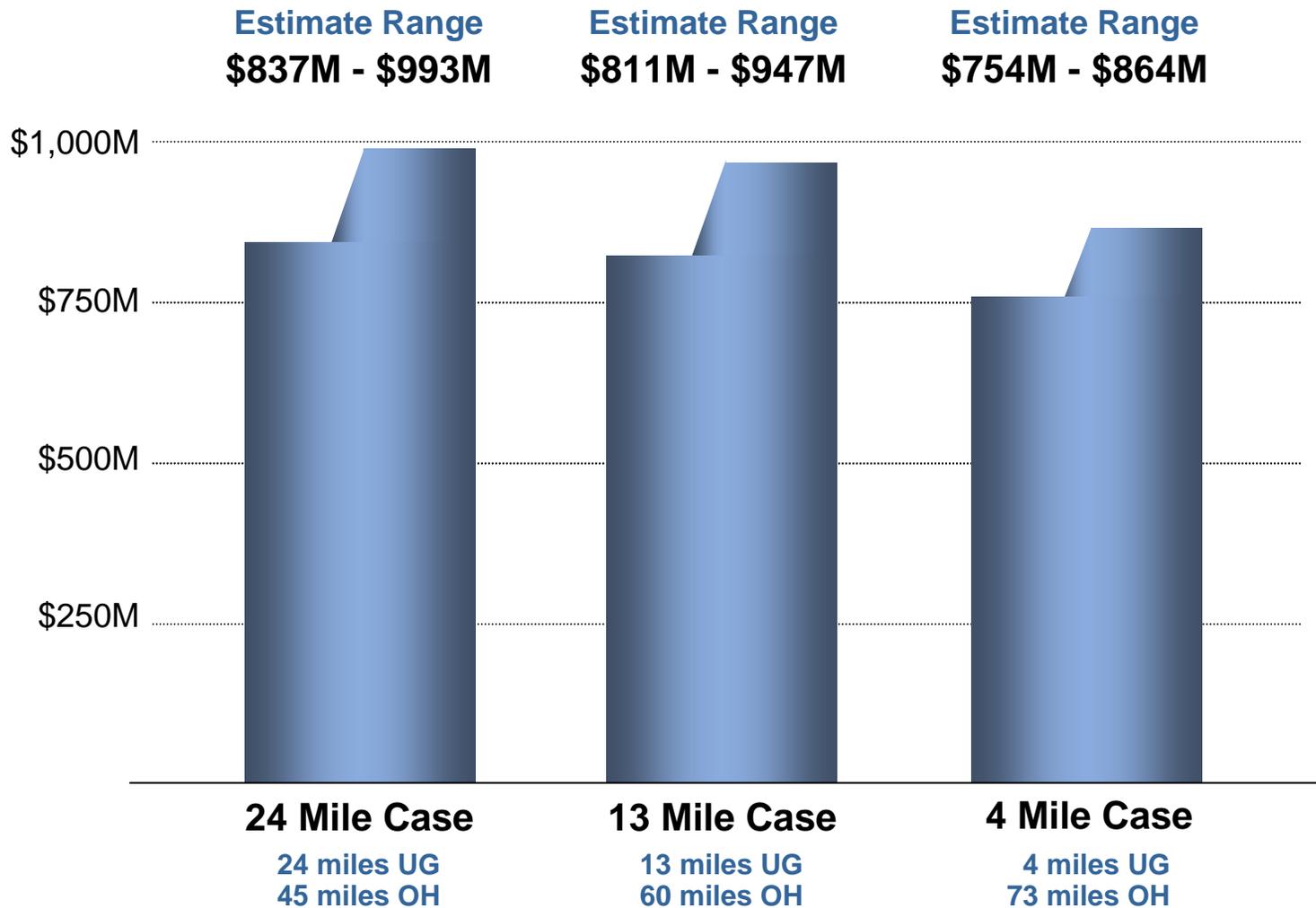
Project Director – Middletown-Norwalk
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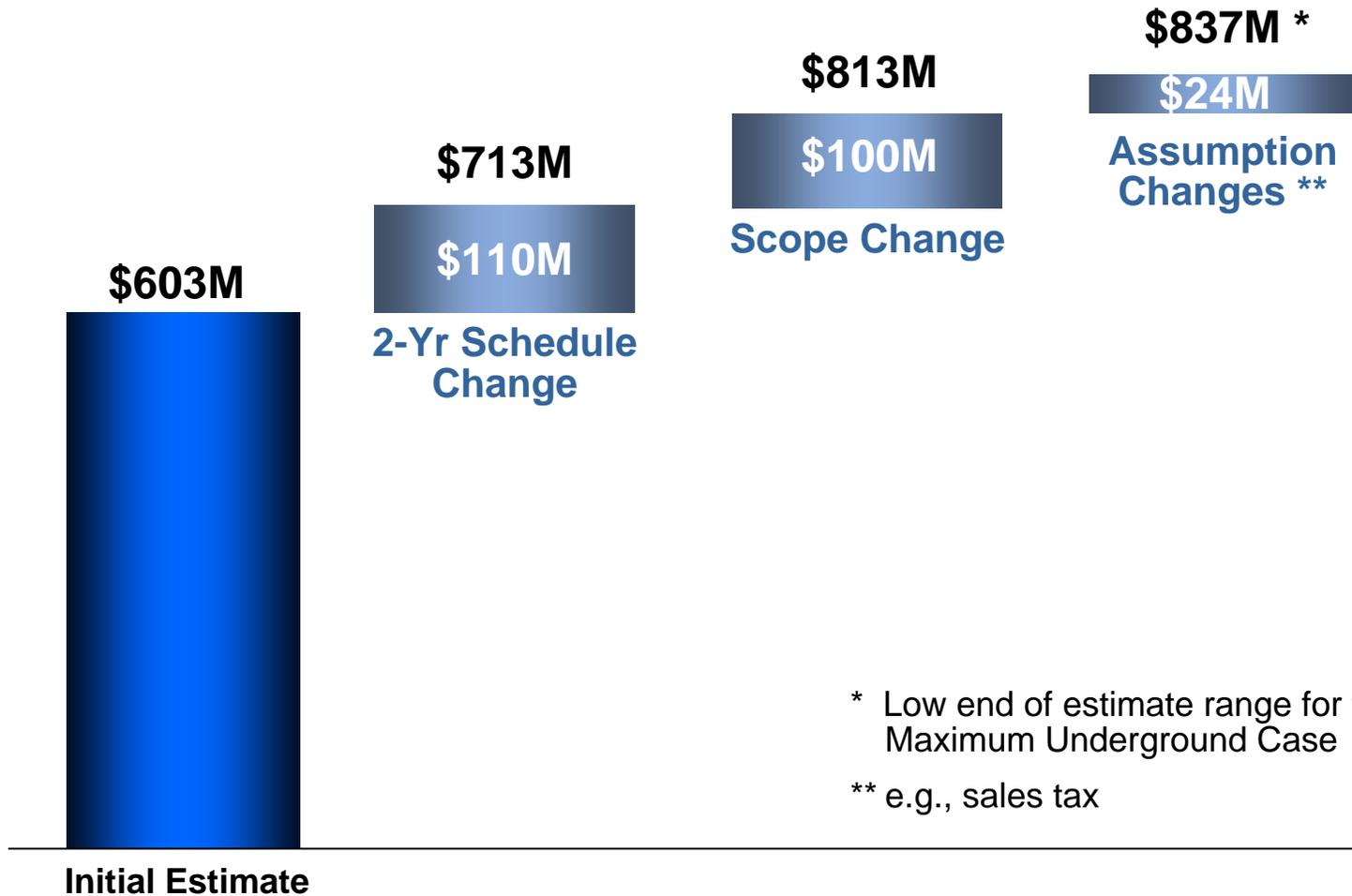
Major Assumptions

- 2009 In-service Date
- 2004 Dollars
- Scope Changes Needed to Make 24 Miles Work
 - Use of XLPE (solid) cable
 - Substation equipment changes
- Cost Variability Associated with Unknowns
 - Final design?
 - Firm bids on construction?
 - Amount of rock and contaminated soil?

Cost Comparison of Reliable Solutions



Delay and Scope Changes Have Increased the Cost of the Project



* Low end of estimate range for the Maximum Underground Case

** e.g., sales tax

Unknowns Could Push the Cost to the High End of the Range

- Variability associated with unknowns (\$128M) for:
 - Commodity costs (e.g., steel, copper, lead)
 - Permit requirements associated with underground construction (CDOT, DEP, ACOE)
 - Variations in structures and equipment specifications as design is detailed
- Greater amounts of rock and contaminated soil (\$28M)

Note: The cost estimates do not include the \$68M to \$80M estimated incremental costs for constructing low-EMF design.

The Cost of Doing Nothing is More Than the Cost of the Project

- Annual Cost of the Project (at \$900M):
 - \$126M, if Connecticut paid the total cost.
 - \$34M, if the cost is regionalized.

- Annual Cost of Doing Nothing:
 - \$308M in 2005 (ISO-NE's projection of what the inefficiency of Connecticut's present transmission system will cost Connecticut customers)
 - Expected to rise in 2006
 - Reliability risks

The Cost of Doing Nothing is More Than the Cost of the Project

<u>Type of Customer</u>	<u>Current Monthly Bill</u>	<u>Cost If Regionalized (\$34M)</u>	<u>Cost If Localized (\$126M)</u>	<u>Cost of Doing Nothing (\$308M)</u>
Residential*	\$95	\$0.99	\$3.67	\$8.97
Commercial*	\$350	\$3.55	\$13.14	\$32.16
Industrial*	\$9,750	\$141.75	\$525.00	\$1,284.09

** Illustrative, using \$900M project cost*

Residential = 700 kWh/month; Commercial = 2,500 kWh/month; Industrial = 100,000 kWh/month

Summary

- The Siting Council now has before it 3 solutions that have been given unprecedented technical scrutiny.
- The Council has been generous in the amount of time it has allowed for comment and participation.
- If the Council makes a decision by April 7, we could have a solution constructed for Connecticut by the end of 2009.