

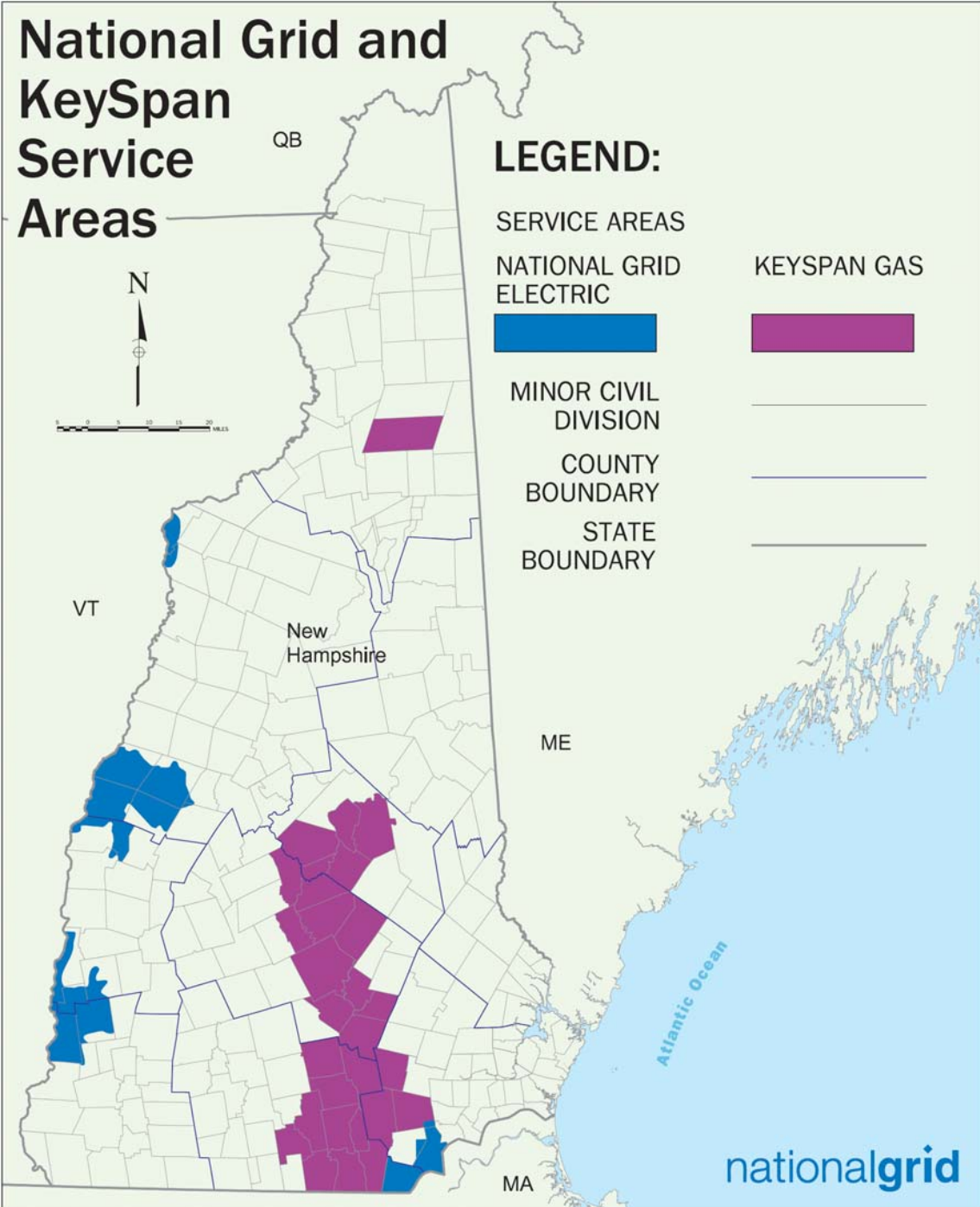
Transmission to Serve Renewables in Northern NH

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National Grid Service Areas (post merger)



- ◆ ~ 252 Mi (2 lines at 126 miles each) of 230 kV transmission were developed around 1930 to export power from Comerford and Moore Hydro facilities to the South
- ◆ 115 kV was developed to supply local area load
- ◆ 230 and 115 kV systems are connected in the area

Areas That May Constrain Movement of New Generation to Customers

- ◆ There are several points on the system which could require upgrades associated with the development of new generation in Coos County area.
 - ◆ Whitefield 115 kV Loop (NU/ PSNH)
 - ◆ 115 kV lines (NU/ PSNH) connecting Whitefield to rest of the system
 - ◆ 230 kV lines connecting Comerford to other 230 kV stations (National Grid)
 - ◆ 230 kV lines from North Litchfield South to Tewksbury, MA (National Grid)
 - ◆ Other individual sections of lines or facilities (Studies may identify some limiting facilities that are difficult to anticipate.) (NU/PSNH, National Grid, VELCO)

How Much Generation Can Be Connected To The System?

- ◆ Depends on the location of generation and load
 - ◆ If generation directly connected to Comerford 230 kV
 - ◆ ~200-400MW (estimate)
 - ◆ If generation connected to the 115 kV
 - ◆ Less power will flow on the 230 kV
 - ◆ 115 kV may be more limiting than the 230 kV
- ◆ **Study is required**
 - ◆ **to define actual capability**
 - ◆ **to understand the impact of the generation interconnections**
 - ◆ **to define upgrade requirements to interconnect desired generation**

What Is Required For System Upgrades?

- ◆ Transmission required to get more than ~100MW of power out of the Whitefield area
- ◆ Connecting generation directly to the Comerford 230 KV may require more transmission and expense than connecting to the 115 kV near Whitefield
- ◆ Other Upgrades may be required to reinforce the system beyond the Whitefield area
- ◆ **Study is required**
 - ◆ **to understand the impact of the generation interconnections**
 - ◆ **to define upgrade requirements**
 - ◆ **to estimate costs of upgrades**

Next Steps

- ◆ **First:** Define the (transmission) need
 - ◆ How much generation to design transmission for
 - ◆ Requires direction from developers and or state
 - ◆ Could involve tariff changes to address stakeholders' needs
- ◆ **Second:** Study local options for getting power out of the Whitefield area
- ◆ **Third:** Identify other system upgrade requirements for each option of getting power out of Whitefield
- ◆ **Fourth:** Evaluate trade-offs between local and system upgrades and select preferred option
- ◆ **Fifth:** Reach business agreements
- ◆ **Sixth:** License, Permit, Design & Construct

Conclusion

- ◆ National Grid willing to work to identify need, challenges of, and options and their costs for transmission system upgrades in northern NH
 - ◆ Through existing ISO-NE process
 - ◆ In cooperation with New Hampshire PUC
 - ◆ With input from developers and community