Connecting the Dots Between Fuel Security & Resource Adequacy

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June 11, 2019

Fuel Security vs Resource Adequacy

Assuring winter reliability requires a combination of:

- Resource adequacy to assure sufficient capability backed by fuel storage (“how many buckets can be filled”)
- Fuel security to assure sufficient fuel arrangements to meet demand (“how many buckets need to be filled”)

The Forward Capacity Market (FCM) verifies that each generating capacity resource is backed by its own storage capacity through the FCM qualification & auditing process, with two exceptions:

- Resources fueled at the whim of nature (Intermittent Power Resources)
- Gas-only fired resources

Exception to the Rule

Most generating capacity resources must demonstrate their unique storage capability and support the associated cost.

Resource Type	Costs of storage capability
Nuclear unit reactor vessel	Investment, licensing, operation and maintenance.
Oil/dual fuel unit tank	Investment, licensing, operation and maintenance
Hydro “pond”	Investment, licensing, operation and maintenance
Electric Storage	Investment, licensing (pumped storage), operation and maintenance

What are the implications of not verifying each gas-only capacity resource has a bucket to fill?

Implications of not verifying enough buckets

If the aggregate gas-only generator winter capability exceeds the region's capability to access gas to support simultaneous generation at such resources, their actual reliability support to meet winter peak load is less than their aggregate MWs of capability

The capability of gas-only generators to access gas at the winter peak depends on:

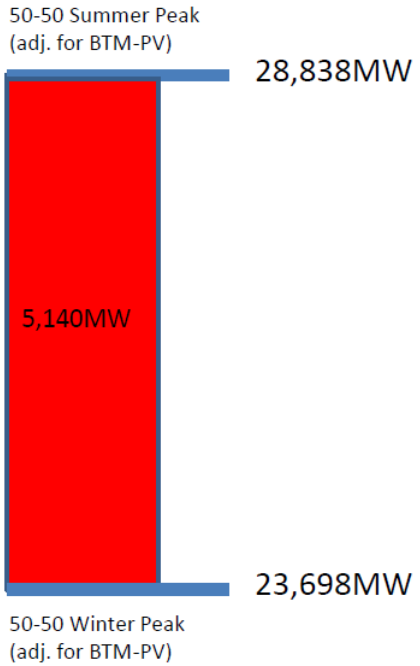
- Pipe line-pack (gas stored in pipe)
- Plus committed LNG storage/vaporization capability
- Less non-generator firm rights (demand) to above

Failure to assure the total qualified capacity of new and existing gas-only generators does not exceed this level risks being resource inadequate to meet winter peak

Example

- Based on FCA13-related values, *being resource adequate at the summer peak may not assure enough gas storage to be resource adequate at the winter peak*

- With 15,739MW of gas-fired resources cleared in FCA13:
  - Assuming 6,000MW are dual fueled
  - If more than 5,140MW of the remaining 9,739MW are unable to simultaneously access gas at the winter peak, the system would not be resource adequate in the winter
  - Situation may be even tighter if lower winter season tie benefits were considered



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Possible approach to assure enough buckets

Establish the highest level of aggregate winter gas-only capability that can be simultaneously fueled at winter peak demand. This would be the maximum gas-only generating capability that can be qualified to sell winter capacity in that Commitment Period.

ISO PP-10, Appendix I analysis seems to already provide a framework to evaluate the level of gas-only-fired resources that can simultaneously generate at peak winter demand.

Give appropriate credit to gas-only resources that have firm gas transportation rights or contracted priority to vaporize and inject gas from stored LNG in the winter period

Limit qualified gas-only winter capacity on the rest of the gas-only fleet to the level of such generation that can simultaneously operate.

Step 1: How many units can be simultaneously fueled?

Determine the maximum gas-only generation that can be fueled at peak winter demand.

- Even with full line pack and assumed LNG injection, there is a limit on how much gas can be simultaneously withdrawn for gas generation purposes at the peak hour
- If the maximum level of gas-only-fired generation is 6,000MWh/h, then the combination of existing and new gas-only qualified winter generating capacity for that FCA/Commitment Period cannot exceed 6,000MW
- Of course, priority access to LNG storage and vaporization capability to support injections greater than those assumed in the PP-10 Appendix I analysis could be procured

Step 2: What if gas-only MWs exceed the capability to fuel?

Assuming 15,000MW of gas-fired generation where 6,000MW have dual fuel capability:

- 6,000MW achieve their winter qualified capacity rating based on their oil storage capability.
- This still leaves 9,000MW of gas-only generators chasing 6,000MW of gas fueling capability. In this example, only 2/3rds of each MW of BTU conversion capability could receive a winter qualified capacity rating.
- In this instance, a 600MW generator relying on “naturally occurring” gas storage could only achieve a 400MW qualified winter capacity rating.

If 1,000MW of the above gas-only resources have sufficient firm contract rights to pipeline storage (i.e., transportation) or contracted priority to the assumed LNG injection capability, then, those resources could use their firm rights to achieve a full qualified winter capacity rating. In that case, the above evaluation would then leave 8,000MWs chasing 5,000MWs of fueling capability.

Benefits of assuring each MW can be fueled

Avoids sending inaccurate market signals where winter capacity is actually not surplus (or possibly even inadequate)

Sends efficient price signals to install dual fuel capability or contract for pipeline transportation or priority access to LNG storage and vaporization capability

Avoids capacity payments for winter gas-only generating capability to levels that cannot be simultaneously fueled

Improves comparability with other sources that either demonstrate own fuel storage or are treated as Intermittent Power Resources

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