



Gas Electric Convergence

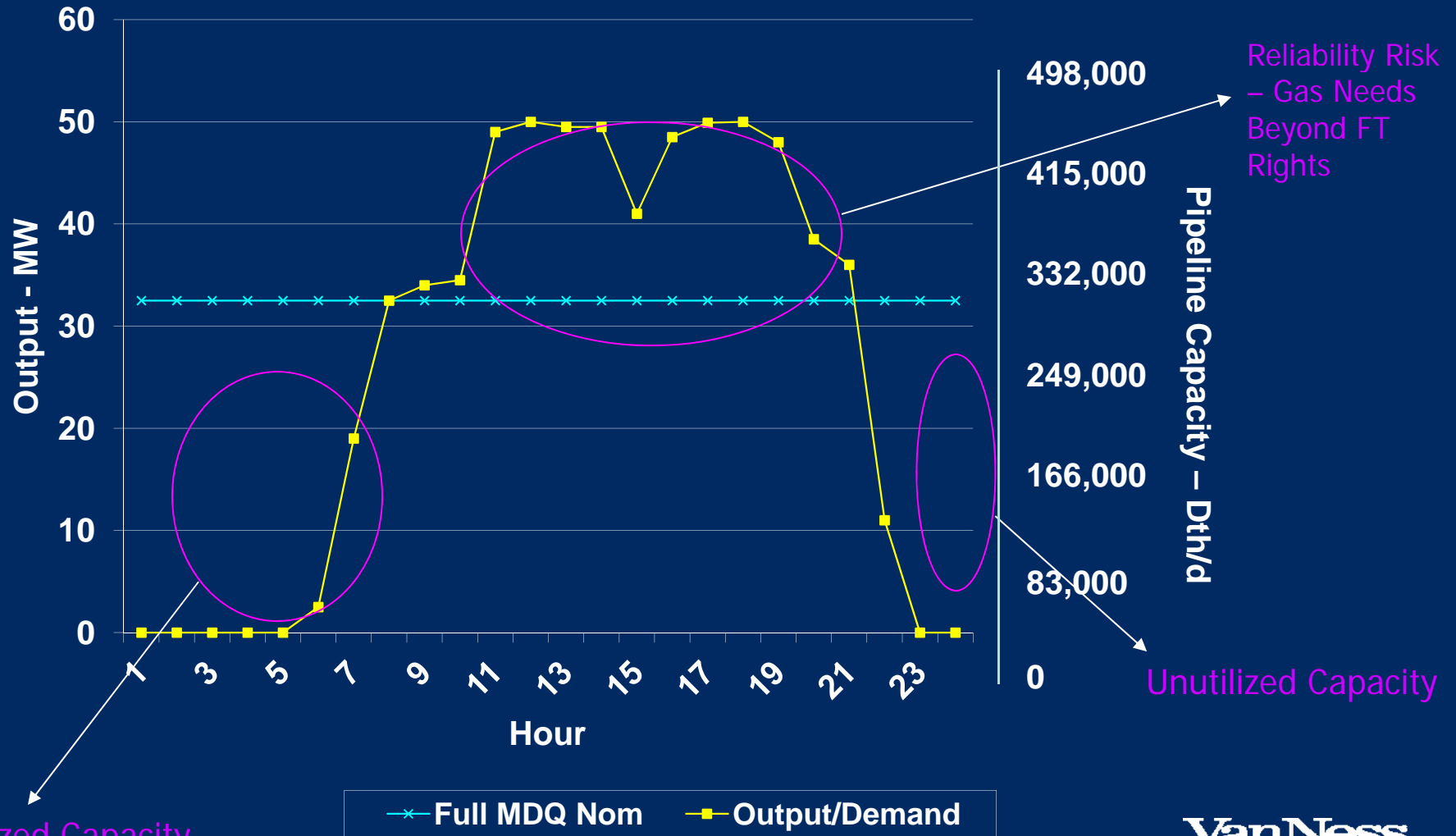
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**Northwest Gas
Association**
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Realization: Gas and Electric Issues are similar

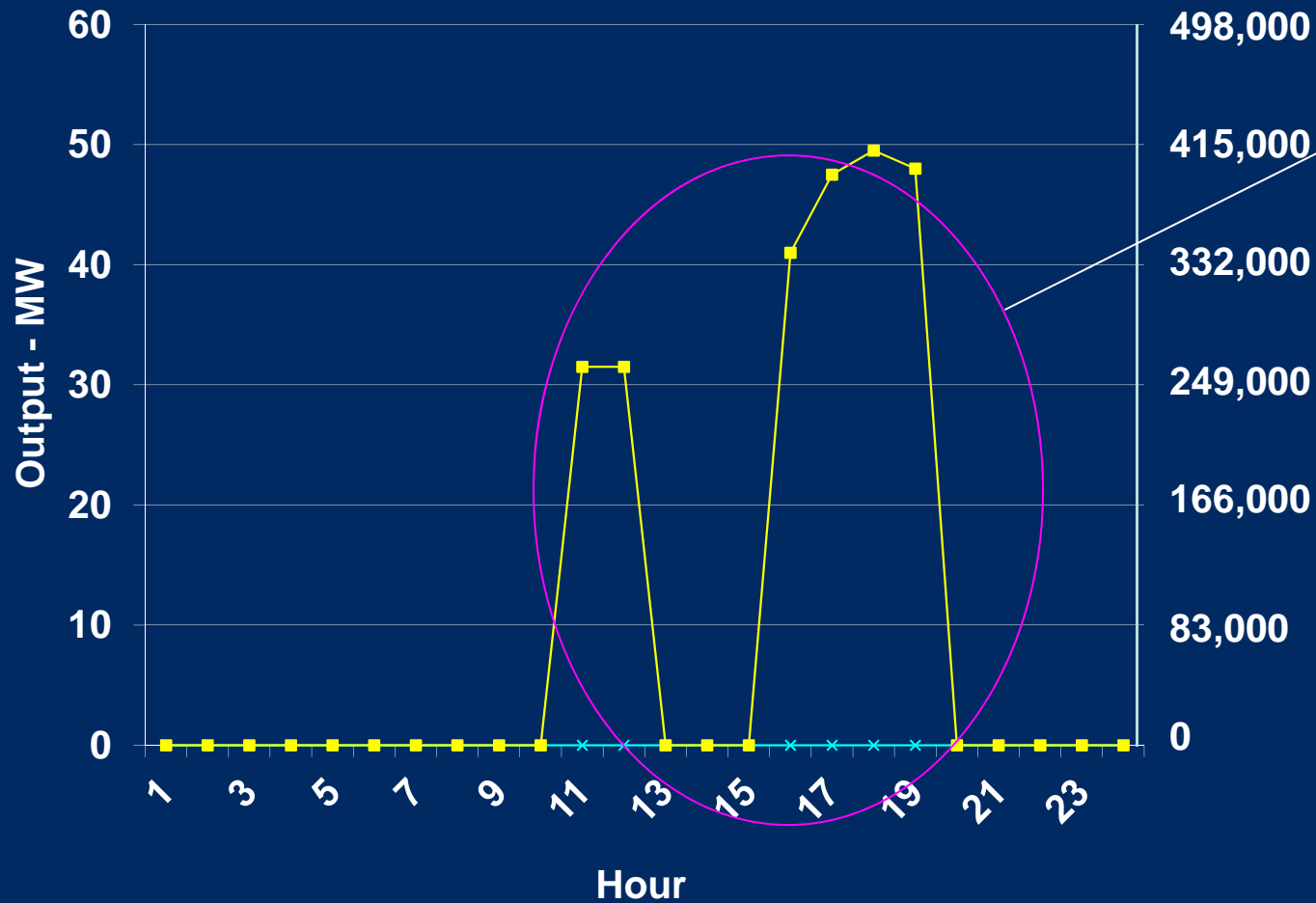
- When there is sufficient capacity (transportation or transmission) for the demand there are no unusual issues to manage
- When supply is constrained
 - Consumers need firm products rather than interruptible products.
 - Firm products increase costs that must be recovered
- We are managing the causes of congestion and the congestion itself

Gas/Electric Disconnect: Firm Transportation (Illustrative only)



Unutilized Capacity

Gas/Electric Disconnect: Interruptible Transportation (Illustrative only)



Reliability Risk – Peaker needs vs other customer's need. Will there be capacity in the pipe, or sufficient gas in the pipe? There may not be capability to provide gas to everyone drawing the gas.

Pipeline Capacity – Dth/d

—x— No Firm Rights —■— Output/Demand

What causes Congestion?

- Insufficient pipeline capacity?
 - Mechanical problems
 - Weather programs
 - Too much demand
- Insufficient quantity of gas in the pipeline?
 - Planning problem
 - Storage problem
 - Supply problem
 - Pipeline pressure (pressure or pipe safety)
- Too much demand?

Management of Gas Supply

- Efficiently utilize all the flexibility in the system
 - Manage pipeline capacity
 - Pipeline safety limits
 - Efficiently utilize gas storage
- Gas generation is a unique customer
 - Large volume of gas of required
 - Pressure of pipe
 - Quantity gas
 - Extended over long periods (base load)
 - Short periods (peaking)
- Pipeline rate structure - generation profile

Management - Too Much Demand

- How is transportation capacity allocated among customers?
 - Price, length of service
 - Type of product – firm, interruptible, or other
- Do we need transportation products shaped for the demand of generation?
 - Generation used for base load or intermittent generation are relatively predictable
 - Generation used for peaking and ancillary services is variable
 - In electric world we created conditional firm

Tools for Aligning Gas Supply with Generation

- Tools include better communications between generators, pipes and storage operators
 - However, standards of conduct preclude pipelines from provide customers with preferential operating information.
 - Information must be provided to the market
- Gas nomination and electric scheduling day inconsistencies

Generator Cost Recovery

- With electric power producers, access to transportation is not the end of the story
 - Regulated power sales must allow the generator to recover fix and variable costs.
 - Recovery of costs in organized markets can be a problem because of market pricing structures.



Questions?
Thank You!

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