



Connecting communities
to cleaner energy

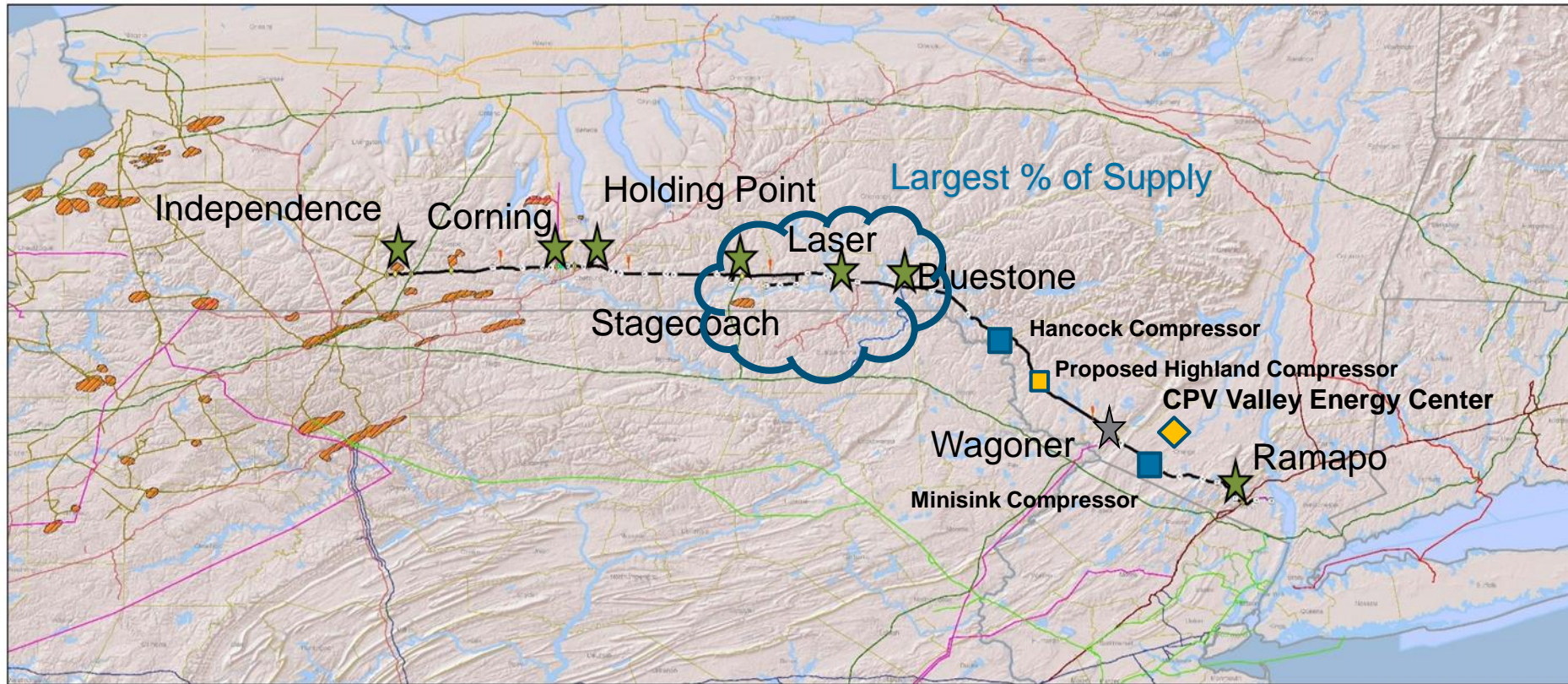
“After the Cold Snap” - Implications for System Operations and Reliability

NGA 2018 Regional Market Trends Forum

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Millennium Pipeline



Millennium Pipeline interconnects with:

- Empire Pipeline
- Dominion Transmission
- National Fuel
- Algonquin
- Columbia Gas Transmission
- Stagecoach Storage
- Laser
- Bluestone

Pipeline expansions that impacted Millennium flows - Winter 2017-18

- Millennium is a “supply header”
 - ~94% of this winter’s deliveries were to interconnecting pipelines or storage facilities
 - Similar to prior periods
- Dominion New Market
 - 112,000 Dth/d to serve the Albany region and Iroquois Pipeline customers
- Millennium Holding Point expansion
 - 93,500 Dth/d to serve Dominion markets
- Algonquin – partial Atlantic Bridge, full season of AIM
 - 40,000 Dth/d to serve New England markets
 - 342,000 Dth/d to serve New England markets

Millennium Pipeline Flows

- Eastern segment of Millennium has a capacity of 1,037,000 Dth/d
- Western segment of Millennium has a capacity of 805,000 Dth/d
- During the winter of 2017-18 (excluding deliveries made with Ramapo receipts)
 - Nine of Millennium's top ten delivery days occurred in December 2017
 - Deliveries averaged in excess of 1.5 Bcf/d
 - December 27, 2017 was the highest delivery day recorded – 1.67 Bcf
 - Deliveries averaged ~164,000 Dth/d higher than prior winter
 - Deliveries to the east were relatively unchanged to the prior winter
 - Restricted Secondary Out of Path to the east once the “cold snap” began – last week of December
 - Daily and hourly flow orders were issued
 - Deliveries to the western portion of the system accounted for most of the increased throughput

After the Cold Snap: Implications for System Operations & Reliability

- *All firm obligations were met*
- System load factor is increasing
- Flexibility is diminishing as load factor increases
 - Primary Firm is a valuable asset
 - “Secondary Firm” provides additional value to shippers, but it is not guaranteed transportation
 - Millennium does not own or operate storage
 - Interruptions from supply points must be restored quickly

Millennium and its interconnecting pipelines exemplified “cooperation”
Open lines of communication were valued and imperative

What's Next

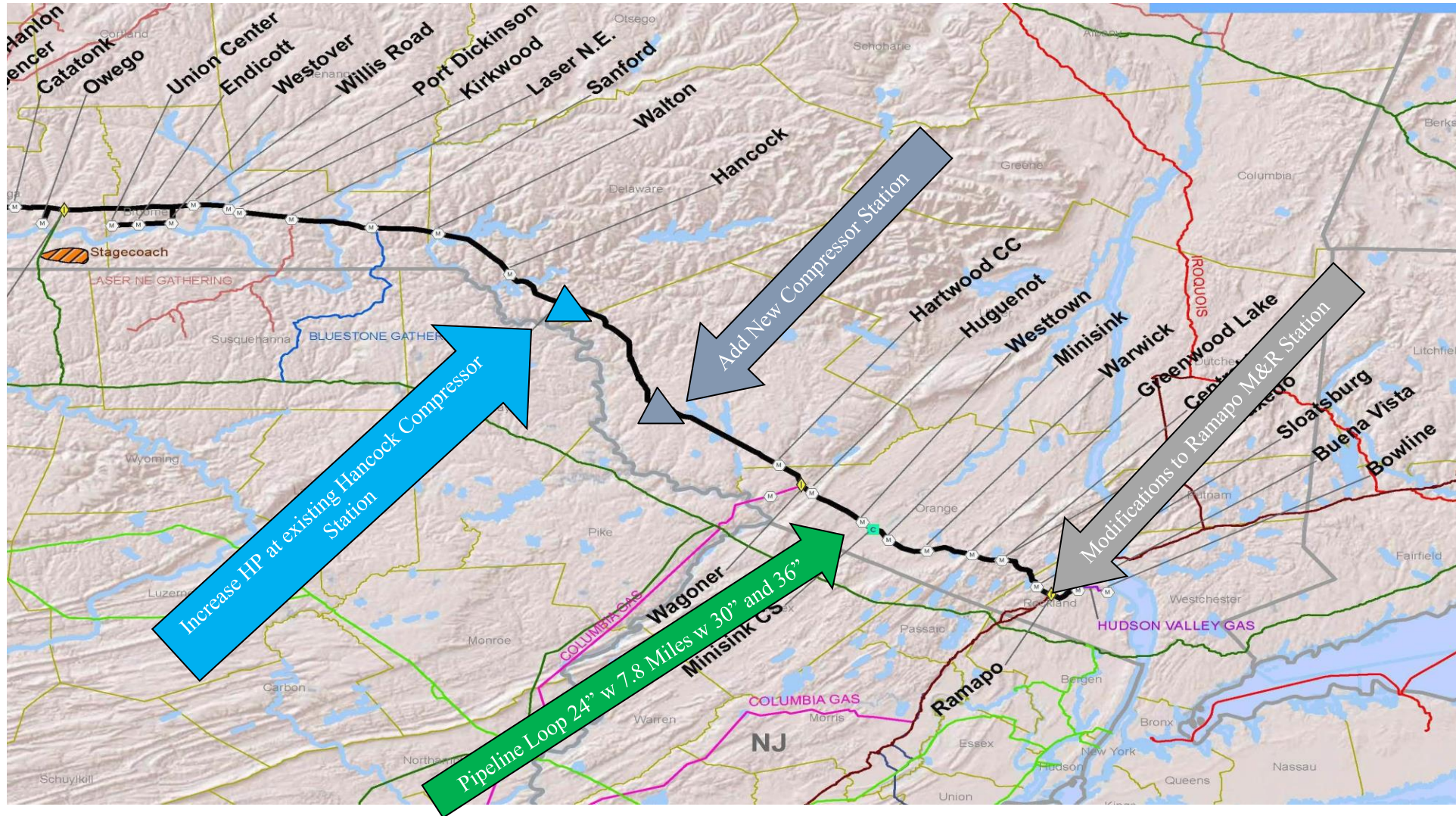
Eastern System Upgrade (ESU)

- Increases capacity to Ramapo by 220,000 Dth/day
 - 215,000 Dth/d contracted by utilities
- Project is under construction with a target in-service date of November 1, 2018
- Doubles compression horsepower on the system
- 7.8 miles of looping



Millennium is in discussions with counterparties for the remaining 5,000 Dth

ESU Project Overview



Valley Lateral Project Description

- 7.8 Mile 16" Lateral to CPV's 650 MW Combined Cycle Power Plant
 - Reduces regional dependency on older less efficient power plants
 - Supports the retirement of Indian Point generation
 - Improves electric pricing for New York energy consumers
- Under construction with a Summer 2018 in-service target



New market directly attached to Millennium – up to 127,200 Dt/d

What would the next Millennium expansion look like?

- To receive approval it would likely be supported by utility shippers
 - A market pull – not a supply push
- It would likely be small in scale and require minimal pipeline looping
 - Least impactful to landowners
- Electric compression would be used if at all possible
 - Minimize carbon footprint

Possibilities do exist
As always, Stakeholder engagement will be a priority

We ALL need to be proactive in messaging

- Opposition to natural gas infrastructure has filled the internet and regulatory filings with statements that pipeline operations and compressor stations emit Volatile Organic Compounds, “VOCs”
 - Benzene, Ethylbenzene, Formaldehyde, Toluene, Xylene
- Opposition fails to mention that ***MANY EVERYDAY*** activities emit VOCs
- Millennium invites you to review a report on the Millennium web site created by Gradient of Cambridge MA
 - http://www.millenniumpipeline.com/wp-content/uploads/2017/04/Gradient-VOC_memo_final.pdf

Did you know?

- The American Lung Association recently issued its “State of the Air 2018” report
 - <http://www.lung.org/our-initiatives/healthy-air/sota/>
- The American Lung Association urges readers to speak out against any roll back of regulations or standards of the Clean Air Act or the Clean Power Plan
- Clearly the message is one of conservation which I believe that most of us in this room agree and participate in
- The report is not meant, nor should we interpret it to be a recommendation for fossil fuels. However, it is interesting that on page 15 under the section titled “Step up to Curb Pollution in Your Community”

“Don’t burn wood or trash. Burning firewood and trash is among the largest sources of particle pollution in many parts of the country. If you must use a fireplace or stove for heat, ***convert your woodstove to natural gas, which has far fewer polluting emissions.***”