



**Facility Repowering Project
March 2019**

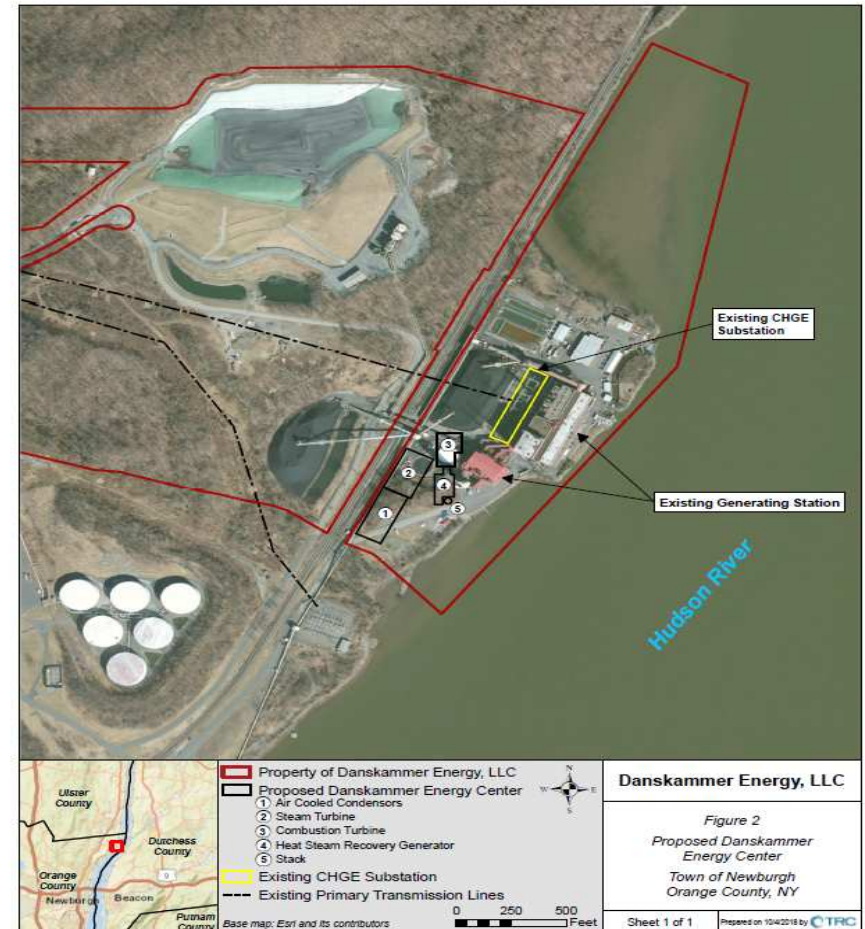
Danskammer Energy – Existing Operations

- *Operating natural gas plant*
 - *Provides capacity reliability and peak generation response to NYISO*
 - *Current capacity factor <5% annually*
 - *Expected to increase significantly post IP closure*
- Built in the 1950s and originally fueled by coal
 - Converted to oil and natural gas during the 1980's and 1990's



Project Overview: Complementing NY Renewable Growth

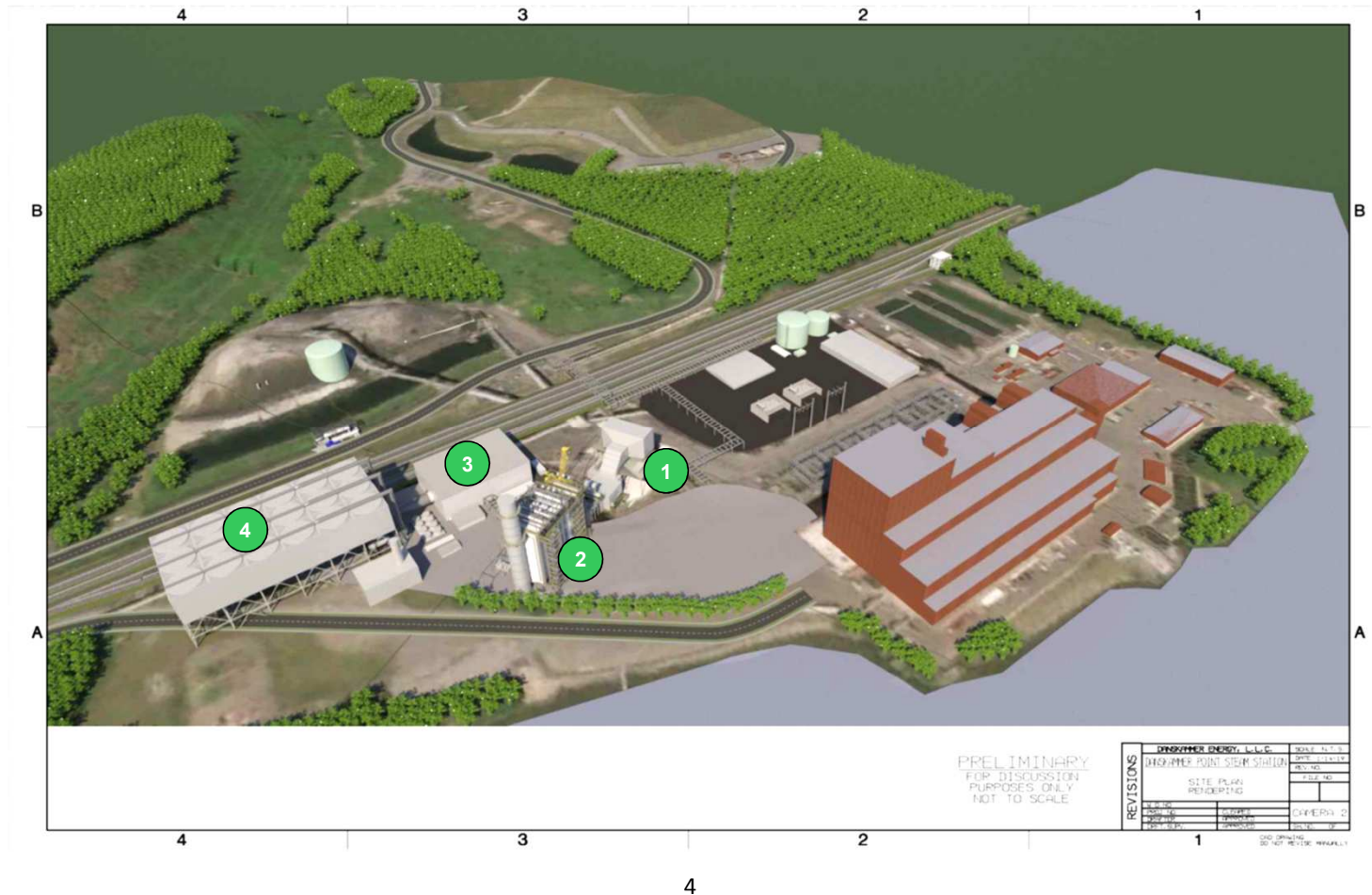
- The new facility will:
 - Power more than 500,000 New York homes and businesses
 - Reduce emissions per megawatt hour of generation
 - Use air cooled condensers to eliminate use of Hudson River water for cooling
 - Provide NYISO with quick start, fast ramping generation when wind & solar aren't available
 - Provide significant economic benefits to surrounding communities
 - Studying feasibility and economics of solar and batteries on site



Proposed Site Configuration – Smaller Footprint

Key Components:

- 1 Gas turbine
- 2 Heat recovery steam generator
- 3 Steam turbine
- 4 Air cooled condensers



Proposed Site Configuration – Existing Infrastructure

Key Components:

- 1** Gas turbine
- 2** Heat recovery steam generator
- 3** Steam turbine
- 4** Air cooled condensers.



Benefits



- Over \$50 million in property and school taxes over next 20 years
- Over \$100 million spent locally during construction
- Provides ~40 local high-paying operations jobs
- More than 400 union construction jobs



Existing vs. Repowered Facility

Existing

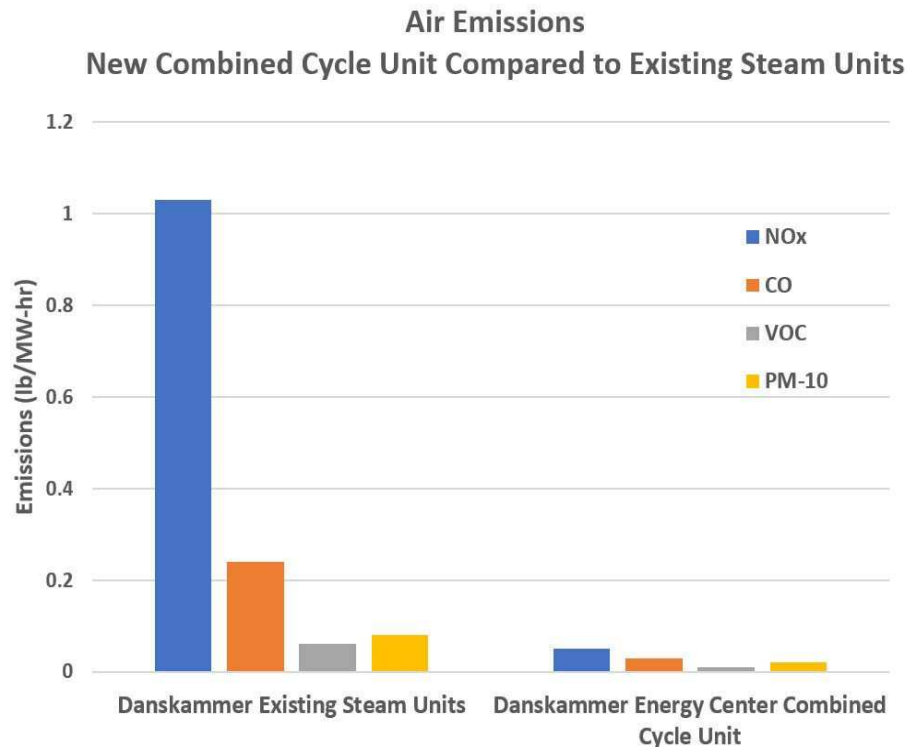
- Significant start times (11 hours)
- Less efficient / higher emissions
- Uses Hudson River for cooling
- Higher electricity cost
- Difficulty supporting renewables

Repowered

- Rapid start (less than 10 minutes)
- 80-90% emissions reduction
- Requires 50% less natural gas
- No use of Hudson River water
- Lower cost electricity
- Backs up renewables

Using the existing brownfield site provides key environmental advantages

Air Emissions Profile – Combined Cycle



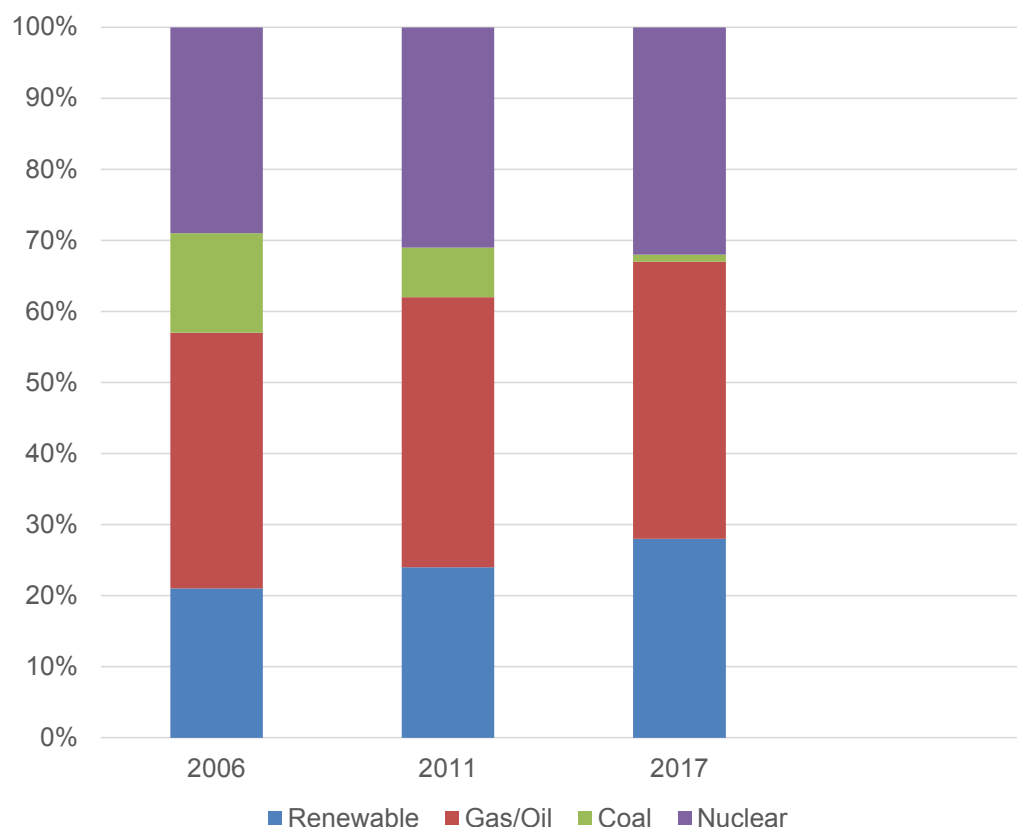
*****This graph has been prepared based on modeling from existing generation that uses the same technology Danskammer will use. Additional air quality emissions modeling will be verified by independent third party analysis.***

****We estimate the new technology used in the plant would reduce emissions on a PER HOUR basis as follows:**

- 95% reduction in NO_x emissions
- 88% reduction in CO emissions
- 85% reduction in VOC emissions
- 75% reduction in PM-10 emissions
- 47% reduction in heat rate from 11,838 Btu/KW-hr for the existing steam plant to 6,300 Btu/KW-hr
- 40% reduction in CO₂e emissions from 1,490 lb/MW-hr for the existing steam plant to 900 lb/MW-hr for the combined cycle plant

Renewable Generation Progress for NY

NYISO Data 2006-2017

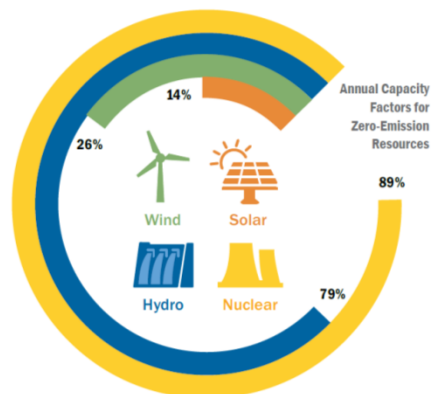


• Renewable Breakdown

- 2006: ~21%
 - Hydro 19%
 - **Wind <1%**
 - Other 2%
- 2011: ~24%
 - Hydro 20%
 - **Wind 2%**
 - Other 2%
- 2017 ~28%
 - Hydro 23%
 - **Wind 3%**
 - Other 2%

NY Renewable Challenges

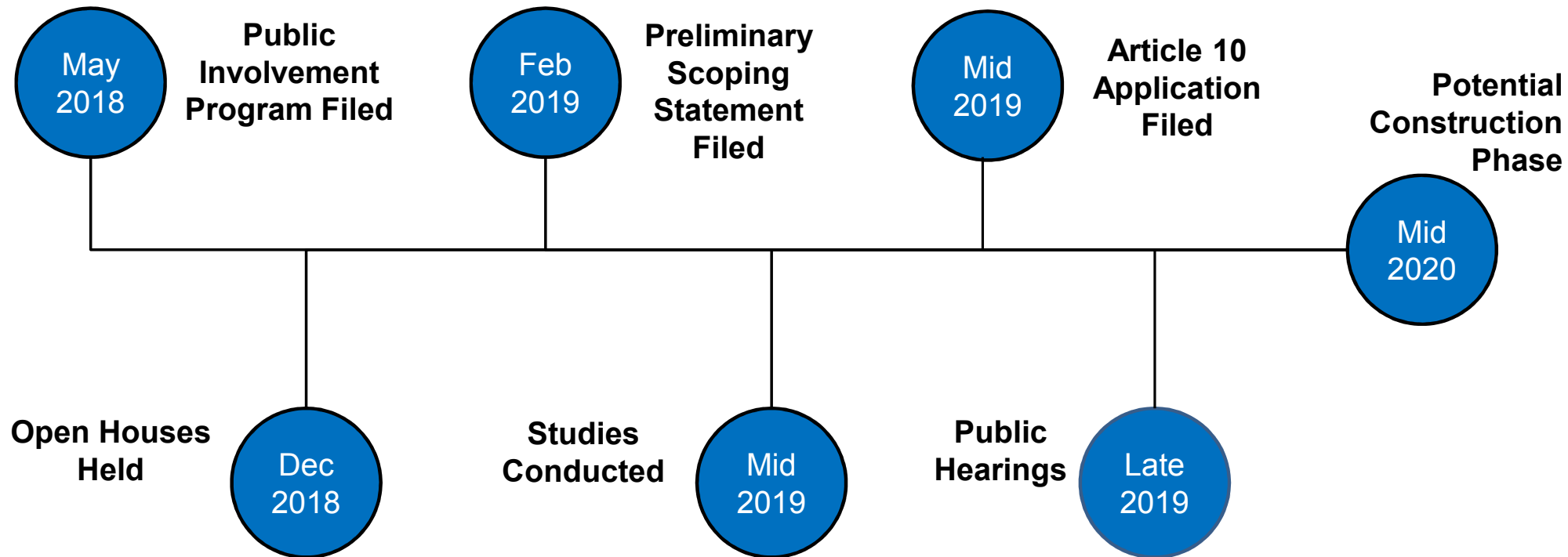
- Low capacity factor for wind (26% avg.) and solar (14% avg.)
- Space for renewable energy mostly in rural upstate areas
 - Heavy bird migration pathways in best wind locations
- Lack of existing transmission to transport energy downstate hinders renewable progress
- To produce ~300 MW of wind takes 28,000 acres, 9 miles of roads



Source: NYISO 2018 Power Trends Report

Article 10 Timeline

Construction Will Take Approximately 30 Months After Final Approval



Article 10 Planned Studies

- Wetlands delineation
- Traffic counts and analysis
- Noise monitoring and modeling
- Cultural resource consultations
- Visual simulations and analysis
- Air emissions modeling
- Economic modeling
- Electric System Impacts
- Electric interconnection system impacts and reliability

Questions?