# **Just Transition Working Group**

### Meeting #8

March 3, 2021 1:00pm-3:00pm



# Just Transition Working Group (JTWG)

### Meeting #8 Agenda

- 1. Introduction/Roll Call
- 2. Member Updates
- 3. Power Plants Subgroup: Site Reuse Opportunities and Inventory Research
- 4. BI Subgroup: Preliminary EITE Identification Research
- 5. Jobs Study Update
- 6. Next Steps

# **Member Updates**

**Recent highlights from Working Group / Advisory Panel Members** 

# **Power Plants Inventory and Site Reuse**

### Power Plants Subgroup Research on Issues & Opportunities, Inventory

March 3, 2021 DRAFT / PRELIMINARY / FOR DISCUSSION ONLY



# Just Transition Workstream: Power Plant Inventory and Site Reuse

#### Scope workstream: Power Plant Inventory and Site Reuse

Description and objective(s)	<ul> <li>Subgroup formed to lead development of two main work-products (CLCPA § 75-0103-8-c):         <ul> <li>Inventory – identifying generation facilities that "may be closed as a result of a transition"</li> <li>Issues &amp; Opportunities – identifying issues and opportunities presented by site reuse</li> </ul> </li> <li>Objectives: 1) create informational inventory collecting objective data on relevant plant characteristics; 2) highlight prominent issues and objectives that attend plant site reuse</li> </ul>
Status	<ul> <li>Inventory:         <ul> <li>Data categories identified, preliminary data collection; draft inventory compiled for review</li> </ul> </li> <li>Issues &amp; Opportunities:         <ul> <li>Issues and opportunities identified; draft slides developed for each, for review</li> <li>Select case studies assembled to accompany list of issues and opportunities</li> </ul> </li> </ul>
Additional engagement	<ul> <li>Further opportunity for cross-panel engagement with interested representatives from the Power Gen. and Land Use &amp; Local Government Advisory Panels</li> </ul>

Issues & Opportunities Presented by Site Reuse

# Issues Presented by Power Plant Site Reuse

**CLCPA directs JTWG to "identify issues and opportunities presented by site reuse":** 

### > Issues presented by site reuse:

- Displaced workforce, and local economic impacts
- Reduced local property tax revenues (County, Municipality, School District)
- Parcel ownership, transfer, and associated factors
- Local planning capacity and community engagement
- Impacts caused by a dormant site being left unattended/unmanaged
- Environmental remediation
- Reliability impacts (current reliability role/contribution)
- Stranded assets and infrastructure impacts
- > Following slides present these issues in more detail

# Reuse Issue: Displaced workforce, local economic impacts

- > Workers at fossil fuel facilities face considerable uncertainty and apprehension related to the future of their workplace and livelihood. Supporting and providing resources to displaced workers is a critical element of New York's just transition, with a need for regular and informative communications
- Existing power plant workforce is a true jewel of New York State and asset for the future of the energy system, being highly skilled and trainable
- It may prove difficult for site reuse/redevelopment to provide same-site job opportunities for workers previously employed in power plant operations, aside from certain opportunities in remediation, security
- Identified need for more advanced outreach and support to employees well prior to a plant's closure where known, in addition to "rapid response" resources deployed in the months immediately preceding closure
- > Recommend focus be on where the workforce impacts/concerns will be most acute e.g., for the midcareer worker with a young family and mortgage, too far from retirement age
  - Activities such as a state-led survey of workers' current status, skillsets, plans for retirement, interests in clean energy
    and other new fields, and other information may be valuable to inform workforce resources and planning
  - Recognition that traditional power gen. workforce is not a single unit, and there will be variability in desires and needs
- Strong desire to find job placement and training opportunities for these workers within New York State as first preference – targeting skills-alignment in both energy and non-energy roles
  - Identified need for both retraining and retention, however, to ensure plants are sufficiently staffed through the remainder
    of their operational lives.
- > Recognize substantial indirect economic impacts in/around plant communities beyond direct employment Draft Material

# Reuse Issue: Reduced local property tax revenues

- In many instances, major power generation facilities are significant contributors to the local property tax base via County, Municipality, School District and other tax payments sometimes the largest single source of tax revenue (especially in more rural communities)
- > The State has recently expanded forward-looking funding for the Electric Generation Facility Cessation Mitigation Fund: Press Release - PSC Provides \$112.5 Million for Communities Impacted by Aging Power Plant Closures
  - <u>Time availability of awards</u>: awards are available over a seven year period with a potential maximum award of 80% of lost revenues in the first year that decreases by 10% of lost revenues each year, to ultimately end in the seventh year in a potential maximum award of up to 20% of lost revenues.
  - See re: Huntley: "School, town and county taxes paid by NRG for the Huntley site had shriveled as of last year to just \$515,000 combined. A state mitigation fund is providing money to offset the loss of the tax revenue from the plant, **but this pool of funding ends in 2023** a deadline that looms over the sale process."
- Proactive efforts will need to be taken at the local and state level to do the long-term budgeting that accounts for potential future tax revenue losses

### Reuse Issue: Parcel ownership, transfer, and associated factors

- > The prospects for reuse of a power plant site is, intuitively, linked to the status of the site's ownership, and the active willingness (or more passive cooperation) of the site owner(s) to pursue or allow for redevelopment.
- > Existing property owner(s) may be directly interested in redeveloping the site, especially as relates to future energy uses at the site. If not, however, options may need to be pursued to transfer parcel ownership and/or subdivide the site to allow for timely redevelopment by other interested parties.
  - This is especially true if the existing owner is not interested/motivated to initiate redevelopment swiftly (see Issue: Impacts caused by dormant site)
- In the process of transfer, subdivision, and reuse more generally, the local zoning status of the parcel will be a material factor confining reuse opportunities and related requirements
  - In some cases, power plants may predate the adoption of local zoning maps and ordinances, meaning that
    parcels may be subject to legacy zoning designations resulting from the power plant itself, rather than
    more up-to-date local plans related to the site
  - Zoning/site considerations may create other issues to contend with in reuse; see: <u>parking requirements</u> for Yonkers plant
- > Willing cooperation of adjacent landowners is also a material factor for the speed and options for reuse, especially for reuse activities requiring greater physical footprint (e.g., solar installations pursuing land lease agreements from neighboring properties)

### Reuse Issue: Local planning capacity and community engagement

- > Tackling a major site reuse/development project such as a power plant is a considerable undertaking for localities, a time and resource-intensive planning exercise posing both technical hurdles and sometimes delicate political challenges
  - But: advance planning can help communities respond to and prepare for power plant closures
- > Especially in the midst and wake of COVID-19, local planning resources and in-house expertise may be constrained and/or misaligned with the needs related to navigating power plant site reuse
  - State resources will be key to bridge any planning gaps, including via direct grants and resources such as a statewide redevelopment toolkit (see: <u>NYSERDA Technical Assistance</u>).
- > A critical element of local planning capacity is to ensure that local community voices are heard and can contribute to planning efforts, both as a matter of principle for a Just Transition, and more concretely to ensure that any plans for reuse are designed and shaped with local community benefits in mind – seizing opportunities for site reuse to repair historical impacts borne locally
  - Successful community engagement may require balancing of preferences between locality priorities and neighboring residents – to strike an appropriate balance between, e.g., future property taxes and use-cases most beneficial to community residents (to the extent those diverge).

*"Effective just transition planning is participatory and government supported, with emphasis on stabilizing revenue, context-specific consideration of existing strengths and needs, fostering a willingness to change, and ensuring environmental remediation" (Grubert, 2020).* 

# Reuse Issue: Impacts caused by dormant site

- > A driving factor for many localities' pursuit of site reuse may be the desire to avoid or minimize the amount of time a site lies dormant – neither operating, providing property tax payments, or being developed for future uses.
- > The impacts caused by a dormant site being left unattended/unmanaged can include fiscal, aesthetic/eyesore, public health and safety, environmental, and abutting parcel concerns, among others.
  - Proactive communication to community members as to the likely duration of any site dormancy/ vacancy should be considered.
- > This issue is not unique to power plants (see, e.g., <u>Bethlehem Steel</u>), but the risk may be acute for power plant sites, given often large physical footprints, their visual prominence on waterfronts and other areas of public interest, the presence of high-voltage equipment, and potential environmental remediation concerns

# **Reuse Issue: Environmental Remediation**

- > A prerequisite for successful and safe site reuse will in many instances be environmental assessment and remediation of any harmful site impacts left behind after plant closure
- > These efforts may entail activities such as asbestos abatement, waste removal, other environmental remediation and restoration, including during and after the demolition of any power plant structures and associated infrastructure (e.g., fuel delivery and storage)
- > The extent of remediation measures required will vary widely by site and by plant type
  - For Somerset plant: "a roughly six-month process involving remediation of the coal yard, cleaning out water collection basins, draining, cleaning and disconnecting tanks and having them removed from the state's chemical bulk storage registry, and capping the plant's on-site landfill."
- > Funding to support remediation activities may require a mix of public and private programs and sources, including federal and state brownfield-related opportunities
- > Certain environmental remediation needs (e.g., Asbestos) may link back to necessary support due to any plant workers who may have been exposed during their time at the plant

# Reuse Issue: Reliability impacts

- > Another key factor to be understood for the purposes of both retirement and reuse is reliability, encompassing any current reliability role/contribution from an existing plant, any impacts that may arise due to retirement, and any future contribution of energy infrastructure at the site
  - Consider flexibility attributes of resource/fuel diversity, especially during periods of prolonged need (long heat/cold spells)
- > Detailed, prescriptive processes exist at the NYISO governing the safe retirement of facilities serving the bulk power system, with studies to determine whether a generator deactivation reliability need would result from the deactivation of a facility in question.
  - Large generators must provide **365 days notice** prior to retirement or mothball outage
  - NYISO review of generator deactivation is part of the **Short Term Assessment of Reliability (STAR)**, which is performed on a quarterly basis in coordination with Responsible Transmission Owners
  - Example: NYISO issued a report in December 2017 on system reliability impacts of Indian Point Energy Center (IPEC) closure dates in 2020 and 2021, concluding that the plant could close on schedule without negatively impacting reliability.
  - Conversely, plans and schedules for retirement and deactivation could be disrupted in instances where studies do reveal a reliability need that cannot otherwise be resolved in time for planned closure
- In some cases, especially for older plants serving New York City, the transmission and distribution grid has been built up based specifically on the locations of existing plants which has created a need to solve for things like load pockets and transmission security constraints with solutions at or providing power to existing plant location areas

# Reuse Issue: Stranded assets and infrastructure impacts

- > Site reuse efforts will also have to contend with impacts related to site assets that may be stranded in the process of closure and redevelopment
- > Regarding a plant itself, the risk of stranded assets from a ratepayer perspective is largely mitigated in the New York context, given the restructured nature of our power market
- > Beyond the plant's status with respect to financing and investor obligations, infrastructure serving the plant, such as fuel transportation and storage, may be rendered obsolete/stranded should their use no longer be needed these may include assets owned by public utilities (electric, gas, water, etc.) and which may have other impacts at the time of plant closure.
- > Plant closure may also prompt potential needs for asset separation, specifically to separate and disentangle switchyard and substation equipment that will remain owned and operated by the transmission owner after the plant's closure.
  - These separation upgrades will bring benefits but can come with meaningful costs; see: <u>National Grid</u> investments energize ex-Huntley plant's redevelopment potential
- > Also a consideration for existing and future infrastructure: climate vulnerability of sites and solutions for reuse, requiring the climate-proofing of future site uses, expecting increasingly common and damaging extreme events

# Opportunities Presented by Power Plant Site Reuse

### JTWG to identify issues and opportunities presented by site reuse

### > Opportunities presented by site reuse:

- Repurposing with onsite clean energy resources
- Interconnection points and infrastructure for offsite renewables
- Commercial redevelopment residential, commercial, mixed-use, etc.
- Port/marine infrastructure
- Industrial reuse, Information Technology/data centers, manufacturing
- Green-space, park infrastructure including for climate resilience
- Diversify/extend property tax revenues
- > Following slides present these opportunities in greater detail

## Reuse Opportunity: Repurposing with onsite clean energy resources

- > Repurposing power plant sites with onsite clean energy resources is a natural top candidate for reuse: solar, wind, energy storage, EV charging, zero-carbon fuel production, etc.
  - While development may pose more challenges than typical/greenfield sites, expect opportunities for both private renewable development and development via public programs such as <u>Build Ready</u> (NYSERDA)
- > Onsite clean energy facilities will benefit from use of significant grid infrastructure and interconnection capacity as power plant CRIS rights expire/are transferred
- While facilities may not be able to replace power plant capacity 1-for-1 in all cases, onsite clean energy resources present opportunity to materially reduce the pollution burden on local communities – a contributor to asthma, other respiratory illness, heart disease, and other health outcomes
  - Geographically targeted demand-side resources (energy efficiency, demand response, active demand management/load flexibility, grid-interactive buildings) are also an important tool
- > Because the transmission and distribution networks have in many cases been built up based specifically on the locations of existing plants, onsite resources (and injections of power) at the location of plants will be especially beneficial to the grid
- For day-to-day peak reliability applications, energy storage technologies present strong potential as a means of replacing peaking units with short runtimes with 4-hour and 8-hour lithium-ion storage technologies (with limitations for more extended and seasonal peak needs in the future, incl. extreme weather conditions)
  - Storage may be most conducive to sites with limited geographical footprint, especially at plants in urban locations

# Site Reuse Case Study

### Poletti Plant – Retired gas- and oil-fired facility, Queens, NY

#### Opportunities:

- Onsite Clean Energy, assisting with integration of renewable energy
- Test-bed for clean energy technologies

According to NYPA, the adaptive reuse of its former power plant site for energy storage is "a first step" in using its assets as a catalyst and test bed for clean energy technologies

# Con Edison Contracts Its Biggest Battery to Date in New York City

A 400-megawatt-hour battery from 174 Global Power will balance NYC's energy needs with increasing offshore wind power capacity.

JEFF ST. JOHN DECEMBER 16, 2020



A former power plant site in Queens will host a 100-megawatt battery being built by 174 Power Global under contract to Con Edison. (Credit: Getty Images)

## Reuse Opportunity: Interconnection/transmission for offsite renewables

- > Sites also present significant opportunities to serve as transmission interconnection points for offsite renewable resources, such as offshore wind and upstate renewables
  - As with onsite resources, this model for reuse would make use of **grid interconnection capacity** and infrastructure availability, as well as space for **new grid infrastructure** like HVDC converter stations
  - Interconnection of offsite resources can be implemented as an independent solution, or as a purposeful complement to onsite clean energy infrastructure (e.g., to pair with energy storage)
- Prominent opportunities exist for this model to emerge, most notably via NYSERDA's Offshore Wind RFPs and Tier 4 RFP, and at/via facilities owned/leased by NYPA and LIPA
  - Proposed offshore wind connections: Empire Wind 1 at Gowanus; Sunrise Wind at Holbrook; Empire Wind 2 at Barrett; Beacon Wind at Astoria
  - Multiple prospective Tier 4 projects announced some connecting at Zone J power plant sites
- > This reuse opportunity may also be compatible with a variety of other potential uses depending on physical footprint of the interconnection/grid equipment necessary, additional available space onsite

# Site Reuse Case Study

### **Brayton Point – Retired Coal Facility, Somerset, MA**

Press Release: CDC, Anbaric sign agreement for \$650M renewable energy investment at Brayton Point

*The Anbaric Renewable Energy Center will optimize Massachusetts' offshore wind industry on the site of a demolished coal-fired power plant* 

### **Opportunities**:

- Onsite Clean Energy
- Renewable Interconnection
- Staging and Manufacturing
- Port/Marine Use



# Reuse Opportunity: Commercial redevelopment

- > Opportunities for a range of commercial redevelopment uses residential, commercial, office-space, mixed-use, etc. may also present themselves as options at power plant sites
  - Such development may support construction jobs, but not all may support long-term onsite job creation
- > Despite potential demolition and remediation needs, commercial developers may find value in site characteristics (location, waterfront access, etc.) as well as to repurpose visually striking elements of the plant structure
  - Variation in real estate property value across regions of the state also likely to direct this interest
- > Depending on site characteristics, can bring **commerce and vibrance** to areas that may not have significant housing population and commercial activity nearby
  - In environmental justice areas and disadvantaged communities, however, caution needs to be exercised to ensure redevelopment centers around benefitting local communities and does not unfold in a way that promotes or induces displacement of local residents

# Site Reuse Case Study

### Potrero Power Station – Retired Gas/Diesel Facility, San Francisco, CA

#### Power Play

# Low-carbon neighborhood takes root at former power station site on San Francisco waterfront

Matt Hickman • June 2, 2020 • Development, News, West

### Opportunities:

- Commercial/mixed-use: housing (30% affordable), retail, office and life sciences space, educational and childcare facilities (with reuse of existing building structures)
- Green-space/park infrastructure: 6 acres of public green space, with a YMCA
- Transit: primary thoroughfares will be carfree, with extensive bike and cycling trails and a shuttle system that will provide frequent access to the nearest BART station



# Reuse Opportunity: Port/Marine Uses & Infrastructure

- > Many plants situated on the waterfront may be valuable as opportunities to pursue port/marine transport infrastructure uses, especially for plants whose water-access is also connected to rail, highway, and other transportation modes
- > Power plant sites on the waterfront may have unique access to deep-water ports in particular, which would allow for uses that protect/preserve the working waterfront, with activities such as offshore wind staging, assembly, and manufacturing
- > Rebuilding the capacity for maritime dependent uses both commercial and recreational may be well-received as a way to continue the history/tradition of waterfront work and access
- > Waterfront access may have the additional attribute of supporting intermodal marine transit, whether for routine use (e.g., ferry services) or as an asset to address climate vulnerability (e.g., storm infrastructure for response and evacuation)

### Reuse Opportunity: Industrial reuse, IT/data centers, manufacturing

- > Like many energy infrastructure applications, heavier energy-consumptive reuse opportunities may also benefit from significant grid capacity available at power plant sites.
- > These more industrial applications may include information technology/data centers, general manufacturing, green manufacturing, greenhouses & agriculture, and others
  - Certain use-cases may also benefit from water-access for cooling processes (e.g., data centers)
- > Many information technology and manufacturing reuse opportunities promise potential for job creation, local investment, and property tax contributions
- > Green manufacturing (e.g., electric vehicle supply chain/componentry) has natural synergies with CLCPA goals for decarbonization and economic development
- > Recognition of certain such use-cases being explored while existing power plants remain operational, rather than repurposing them
  - Close attention needed to ensure industrial applications are energy efficient and powered by clean energy so as to further CLCPA achievement and economic development goals

# Site Reuse Case Study

### Widows Creek Plant – Retired Coal Facility, Jackson County, Alabama

# Google to convert Alabama coal plant into renewable-powered data centre

Technology company says it will open 14th data centre at Widows Creek site in Jackson County that will be powered with 100% renewable energy

**Opportunities**:

- Information technology, energyintensive use (data center)
- Interconnection/delivery of renewable energy
- Commercial: office space for technical jobs



*"At Widows Creek, we can use the plants' many electric transmission lines to bring in lots of renewable energy to power our new data center".* The company said the center will create between 75 and 100 highly technical jobs, with potential for growth in the future.

## Reuse Opportunities: Green-space, parks, climate resilience infrastructure

- > Power plant sites may also provide creative opportunities for publicly accessible greenspace, and parks infrastructure – especially for waterfront locations
- > This includes adaptive forms of reuse providing climate resilience/ecological services, e.g. leveraging designs and measures to reduce/absorb flood surges and alleviate heat island effect, among other nature-based adaptation solutions
- > Ability (lack thereof) to benefit financially from reuse exclusively reserved to these opportunities may not make them the first preference of existing property owners, but could add value as a partial reuse alongside other forms of compatible development and reuse
  - And public entities could play a more central role where opportunities exist to conserve land and create publicly beneficial green-space – acknowledging that doing so may not by itself support longterm job creation
- > Reuse could also be directed to actively complement and combine with adjacent/nearby park infrastructure that may exist along waterfronts

# Reuse Opportunity: Diversify and extend property tax revenues

- > Any/all of the aforementioned opportunities should provide localities with the added benefit of finding uses to diversify and extend property tax revenues from sites after the end of a plant's useful life
- > A host community's planning for the long-term/life after the plant should be reflected in the use or uses pursued, with a preference in some cases for **multi-stream property tax revenues**
- > Local, regional, and state economic development efforts should leverage the site, employee skillsets, and community attributes to guide economic development strategy, once again in a manner seeking multiple, diversified tax revenue-positive enterprises
- > Municipalities and property owners will likely pursue a variety of tactics to market and promote interest in redeveloping a power plant site for new uses
  - **Digital and social media** may provide new opportunities to attract positive attention to the opportunities for site reuse, new opportunities for members of the community to weigh in with input

# Q&A and Discussion

# Power Plants Inventory

# Power Plant Inventory: Objectives and Approach

CLCPA: "identify facilities that may be closed as a result of a transition to a clean energy sector"

### > Objectives of the power plant inventory effort

- Fulfill requirements of the statute, inform Climate Action Council and Advisory Panel deliberations and actions
- Compile key information about the existing generation fleet, useful to a range of interested stakeholders
- Help inform understanding of issues and opportunities, including those related to workforce, local economic/tax impacts, etc.
- Assist in ongoing and future planning efforts at local and state level, and prepare for any future federal resources

# Power Plant Inventory: Objectives and Approach

CLCPA: "identify facilities that may be closed as a result of a transition to a clean energy sector"

### > Important notes and reminders

- Inventory is <u>informational only</u>, rather than predictive or decisional: it does not opine in any way on the State or Working Group's view of which plants will close, the cause(s) of any future closures, or the specific timing/order of any future closures
- Just Transition Working Group is not a decision-making body, and this inventory is not binding in any way
- Inventory focuses on objective plant metrics and data-points most salient in future transitions: plant age, capacity factor, fuel type, environmental/emission compliance, etc. Many data points will change over time, and this inventory is just a snapshot.
- Planning decision will be result of multiple considerations: commercial, operational, regulatory, market factors, among others
- Plant deactivations follow very prescriptive process through New York Independent System Operator (NYISO). Inclusion of a plant on this list does not suggest such deactivation planning or other NYISO processes are imminent or should be initiated.
- In referencing inventory, please be respectful of and sensitive to the community and human stories contained in and behind the numbers on the page: the jobs, reliability, emissions, and health impacts alike
- All in the context of major CLCPA requirements: 70% renewable by 2030, 100% zero-emission by 2040

# Power Plant Inventory: Overview of Research

Preliminary list of power plants for consideration in our inventory

### > Private facilities (IPPs, IOUs)

- 32 facilities, roughly 16,000 MW of capacity
  - Inclusive of 3 GW of previous/known retirements, plus multiple facilities that will be out of service pursuant to DEC regs
- Represent roughly \$140M local property tax contributions per year (excl. indirect local economic impacts)
- Employment figures still being compiled (only select data available)

### > Public facilities (NYPA, LIPA, municipal utilities)

- 29 facilities, roughly 6,500 MW of capacity
  - Inclusive of multiple facilities with units going out of service pursuant to DEC NOx regulations
- Represent roughly \$180M local property tax contributions per year (excl. indirect local economic impacts)
- Employment figures still being compiled (only select data available)

### > Reminder of overall statewide generation fleet:

- ~150 emitting facilities, total of 38+ GW of total capacity (26+ GW of which are fossil-based resources)
- Roughly 24,000 employed in full traditional electric power generation sector, as of 2019 (pre-COVID) *Draft Material*

### Non-Governmental Plants (e.g., IPPs, IOUs, etc.) – Slide 1 of 5

Simple Power Plant Name	Owner/Operator	City/town	NYISO Zone	GIS Coordinates	Plant Vintage (Oldest Unit)	Primary Fuel	Nameplate Rating (MW)	2018 Capacity Factor (Aggregate)	2019 Capacity Factor (Aggregate)	Jobs	Local Property Taxes (\$ per year)	Located in Potential EJ Area?	Grid Infrastructure	Potential Clean Energy Associated w/ Site	Active Repowering Proposal	Site Information
East River (note: cogen, electricity and steam)	ConEd	Manhattan	ı	40.72719, -73.9725	1951-11-01	NG	726.2	46.5%	44.3%	290	\$23,800,000	Y	CRIS (S/W): 653.9 MW / 731.4 MW Voltage at substation: East River 69kV Local TO substation: East River			Acreage: 3.2 (should be confirmed) Parcel zoning: M3-2 Assets (Buildings, Rail, Roads, Water): East River, FDR Drive, ConEd (building)
Danskammer	Danskammer Energy, LLC	Newburgh	G	41.57304527 022974,- 73.96472865 969712	1951-12-01	NG	532	0.7%	0.2%	40*	\$1,500,000	N	CRIS (S/W): 511.1 MW / 511.1 MW Voltage at substation: 115kV Local TO substation: Danskammer		Q#791 Danskammer Energy Center is a repowering project that would include retiring Danskammer units# 1, 2, 3, and 4. Currently in Article 10 proceeding.	Acreage: 180 Parcel zoning: Assets (Buildings, Rail, Roads, Water): Hudson River, Roseton Generating Facility
Greenidge 4	Emera	Torrey	с	42.6789, -76.9483	1953-12-01	NG	112.5	20.5%	5.7%		\$60,000	N	CRIS (S/W): 106.3 MW / 106.3 MW Voltage at substation: 115 kV Local TO substation: Greenidge			Acreage: 300 Parcel zoning: I- Industrial Assets (Buildings, Rail, Roads, Water): Seneca Lake, NY-14 (hwy)
Astoria (Steam - ConEd)	Eastern Generation Co. (ArcLight Capital)	Queens	ı	40.78767, -73.91256	1954-03-01	NG	959	12.8%	7.9%	90 (union only)	\$575,000	Y	CRIS (S/W): 938.9 MW / 943.7 MW Voitage at substation: Local TO substation:	Storage		Acreage: 300 Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): East River
Сауида	Cayuga Operating Company, LLC	Lansing	с	42.603333, - 76.63555	1955-09-01	віт	322.5	3.5%	5.9%	2	\$2,200,000	N	CRIS (S/W): 154.1 MW / 154.1 MW Voltage at substation: 115 kV Local TO substation: Cayuga	Large-scale solar		Acreage: 400 Parcel zoning: IR Assets (Buildings, Rail, Roads, Water): Road access. water
Arthur Kill	NRG	Staten Island	ſ	40.59171, - 74.20011	1959-08-01	NG	931.7	12.1%	11.1%		\$8,600,000	Y - near	CRIS (S/W): 903.3 MW / 908.4 MW Voltage at substation: 138/345 Local TO substation: Freshkill 138 kV	Storage		Acreage: Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): Water, Pratt Industries Paper Mills (nearby)
Ravenswood	Helix Ravenswood, LLC (LS Power)	Queens	ı	40.75883, -73.94485	1963-02-01	NG	2,445.90	15.5%	Dräj	ft Ma	teriat <sup>*,000,000</sup>	Y	CRIS (S/W): 2024.9 MW / 2084.4 MW Voltage at substation: 345 kV Local TO substation: Rainey	Storage, Transmission		Acreage: 27 Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): East River

Non-Governmental Plants (e.g., IPPs, IOUs, etc.) – Slide 2 of 5

Simple Power Plant Name	Owner/Operator	City/town	NYISO Zone	GIS Coordinates	Plant Vintage (Oldest Unit)	Primary Fuel	Nameplate Rating (MW)	2018 Capacity Factor (Aggregate)	2019 Capacity Factor (Aggregate)	Jobs	Local Property Taxes (\$ per year)	Located in Potential EJ Area?	Grid Infrastructure	Potential Clean Energy Associated w/ Site	Active Repowering Proposal	Site Information
74 St. (note: steam)	ConEd	Manhattan	1	40.76803, -73.95091	1968-10-01	KER	37	0.1%	0.1%	138	\$1,500,000	Yes, near	CRIS (S/W): 39.1 MW / 49.2 MW Voltage at substation: 138kV Local TO substation: East 75th Street			Acreage: Parcel zoning: M3-2 Assets (Buildings, Rail, Roads, Water): East River, FDR Drive
59 St. GT 1 (note: steam)	ConEd	Manhattan	1	40.77133, -73.99108	1969-06-01	KER	17.1	0.1%	0.1%	110	\$9,800,000	Yes, near	CRIS (S/W): 15.4 MW / 20.1 MW Voltage at substation: 138kV Local TO substation: West 65th Street			Acreage: Parcel zoning: M3-2, CL Assets (Buildings, Rail, Roads, Water): Hwy 9A, Hudson River
Coxsackie GT	Central Hudson Gas & Elec. Corp.	Coxsackie	G	42.3435, -73.8353	1969-12-01	KER	21.6	0.3%	0.4%		\$34,800	Y	CRIS (S/W): 19.9 MW / 26.0 MW Voltage at substation: 69 kV Local TO substation: Coxsackie			Acreage: Parcel zoning: Medium Density Residential–1 Assets (Buildings, Rail, Roads, Water): RTE 9W (road), Coxsackie Correctional Facility
South Cairo	Central Hudson Gas & Elec. Corp.	Cairo	G	42.29128, -73.98645	1970-06-01	KER	21.6	0.2%	0.1%		\$62,500	N	CRIS (S/W): 19.8 MW / 25.9 MW Voltage at substation: 69kV Local TO substation: South Cairo			Acreage: Parcel zoning: COM: commercial Assets (Buildings, Rail, Roads, Water): RNYS Route 32, 23
Astoria - NRG	NRG	Queens	ſ	40.78098, -73.90683	1970-06-01	KER	558	0.8%	0.3%	30	\$4,500,000	Ŷ	CRIS (S/W): 504.4 MW / 620.8 MW Voltage at substation: 138 kV Local TO substation: Astoria	Storage	Q#393 Berrians East Replacement is a repowering project that would include retiring NRG/Astoria GTs 2, 3, and 4 and replacing with more efficient turbines. Project was granted its CPCN certificate by the PSC in 2011; application pending for DEC air permits [to verify]	Acreage: 15 Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): East River
Hudson Ave (note: steam)	ConEd	Brooklyn	1	40.7052, -73.9807	1970-07-01	KER	48.9	0.1%	Draf	t Mat	erial <sup>\$3,000,000</sup>	Yes	CRIS (S/W): 15.1 MW / 19.7 MW Voltage at substation: 69 kV Local TO substation: Farragut 138 kV			Acreage: Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): East River

### Non-Governmental Plants (e.g., IPPs, IOUs, etc.) – Slide 3 of 5

Simple Power Plant Name	Owner/Operator	City/town	NYISO Zone	GIS Coordinates	Plant Vintage (Oldest Unit)	Primary Fuel	Nameplate Rating (MW)	2018 Capacity Factor (Aggregate)	2019 Capacity Factor (Aggregate)	Jobs	Local Property Taxes (\$ per year)	Located in Potential EJ Area?	Grid Infrastructure	Potential Clean Energy Associated w/ Site	Active Repowering Proposal	Site Information
Hillburn GT	Seneca Power Partners / Alliance Energy Group	Hillburn	G	41.12713740 4844596, - 74.16438035 962115 -74.16	1971-04-01	NG	46.5	0.1%	0.1%		\$314,600	Y	CRIS (S/W): 37.9 MW / 51.8 MW Voltage at substation: 69 kV Local TO substation: Hillburn			Acreage: Parcel zoning: Assets (Buildings, Rail, Roads, Water): Ramapo River. NJ-17. Rail (near)
Shoemaker GT	Seneca Power Partners / Alliance Energy Group	Middletown	G	41.4278, -74.4186	1971-05-01	NG	41.9	0.1%	0.3%		\$193,000	Y	CRIS (S/W): 33 MW / 45 MW Voltage at substation: 115/138 kV Local TO substation: Shoemaker 69 kV			Acreage: Parcel zoning: I-2: Heavy Industry Assets (Buildings, Rail, Roads, Water): I-84, Rail (near)
Gowanus	Eastern Generation Co. (ArcLight Capital)	Brooklyn	J	40.66433, - 74.00674	1971-06-01	FO2	640	0.3%	0.1%	50 (union only)	\$3,500,000	Y	CRIS (S/W): 578.4 MW / 755.3 MW Voltage at substation: 138kV Local TO substation: Gowanus	Gowanus substation is landing point for Empire Wind 1 (OSW).	Q#778 Gowanus Gas Turbine Facility Repowering is a repowering project that would include retiring Eastern Generation Gowanus Barges# 1, 2, 3, and 4. Currently in Article 10 proceeding.	Acreage: 38 Parcel zoning: M3 -1 Assets (Buildings, Rail, Roads, Water): Gowanus Canal, Gowanus Expressway
Narrows	Eastern Generation Co. (ArcLight Capital)	Brooklyn	ı	40.65104, -74.02543	1972-05-01	FO2	352	2.3%	1.2%	30	\$2,600,000	Y	CRIS (S/W): 309.1 MW / 403.6 MW Voltage at substation: 138 kV Local TO substation: Narrow	Storage		Acreage: Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): Bay Ridge Channel, Belt Parkway
Bowline	GenOn Energy Management, LLC	West Haverstraw	G	41.2044, -73.9689	1972-09-01	NG	1,242	4.3%	2.6%		\$2,600,000	Y, near	CRIS (S/W): 1145.1 MW / 1145.1 MW Voltage at substation: 345 kV Local TO substation: Bowline			Acreage: 150 Parcel zoning: Assets (Buildings, Rail, Roads, Water): Minisceongo Creek, Hudson River
Indian Point	Entergy	Buchanan	н	41.26872, -73.95214	1973-08-01	UR	2,311	42.8%	82.5%	350 union, today; 120 as of 5/20; 100+ contractors, to decrease	\$32,000,000	No	CRIS (S/W): 2066.9 MW / 2066.9 MW Voltage at substation: 345 kV (double check ) Local TO substation: Indian Point			Acreage: 240 Parcel zoning: M2, MD, R-15, others Assets (Buildings, Rail, Roads, Water): Marine access, gas lines, etc.
Roseton	Castleton Commodities Int'l	Newburgh	G	41.57106674 384892, - 73.97440606 95401	1974-09-01	FO6	1,242	4.7%	1.3% Draft	t Mat	52,500,000 <b>terial</b>	N	CRIS (S/W): 1220.5 MW / 1220.5 MW Voltage at substation: 345kV Local TO substation: Roseton			Acreage: Parcel zoning: I- Industrial Business Assets (Buildings, Rail, Roads, Water): Hudson River, Rte 9W, Roseton Generating Facility

### Non-Governmental Plants (e.g., IPPs, IOUs, etc.) – Slide 4 of 5

Simple Power Plant Name	Owner/Operator	City/town	NYISO Zone	GIS Coordinates	Plant Vintage (Oldest Unit)	Primary Fuel	Nameplate Rating (MW)	2018 Capacity Factor (Aggregate)	2019 Capacity Factor (Aggregate)	Jobs	Local Property Taxes (\$ per year)	Located in Potential EJ Area?	Grid Infrastructure	Potential Clean Energy Associated w/ Site	Active Repowering Proposal	Site Information
Oswego 5+6 (Oswego Harbor Power)	NRG	Oswego	с	43.4586, -76.5319	1976-02-01	FO6	1,803.60	0.3%	0.1%	43	\$3,200,000	Y	CRIS (S/W): 1685.5 MW / 1685.5 MW Voltage at substation: 345 kV Local TO substation: Oswego			Acreage: 93 Parcel zoning: I- Industrial Assets (Buildings, Rail, Roads, Water): Lake Ontario, NY-104, SUNY Oswego (nearby)
Somerset	Somerset Operating Company, LLC	Somerset	A	43.35889, -78.60472	1984-08-01	віт	655.1	10.3%	6.0%	16	\$500,000	N	CRIS (S/W): 686 MW / 686 MW Voltage at substation: 345 kV Local TO substation: Somerset	Large-scale solar		Acreage: 1,800 Parcel zoning: PUD Assets (Buildings, Rail, Roads. Water): Rail
Indeck-Yerkes	Indeck Energy Services	Tonawanda	А	42.95, -78.91	1990-02-01	NG	59.9	11.5%	4.8%		\$135,000	Y, near	CRIS (S/W): 49.7 MW / 60.5 MW Voitage at substation: 230 kV Local TO substation: Huntley 230 kV			Acreage: Parcel zoning: R3 (based on coord) Assets (Buildings, Rail, Roads, Water): Niagara River. I-190
Indeck-Oswego	Indeck Energy Services	Oswego	с	43.47175, -76.49347	1990-05-01	NG	57.4	12.7%	4.9%	15*	\$155,000	Y, near	CRIS (S/W): 51.6 MW / 66.7 MW Voltage at substation: 345 Local TO substation: Oswego			Acreage: Parcel zoning: I: Industrial Assets (Buildings, Rail, Roads, Water): Lake Ontario. NY-104
Indeck-Silver Springs	Indeck Energy Services	Silver Springs	с	42.6544, -78.0772	1991-04-01	NG	56.6	15.8%	8.7%	15*	\$50,000	N	CRIS (S/W): 51.1 MW / 66.1 MW Voltage at substation: 115 kV Local TO substation: Silver Springs			Acreage: Parcel zoning: Assets (Buildings, Rail, Roads. Water): N/A
Sterling	Seneca Power Partners / Alliance Energy Group	Sherrill	E	43.08034, -75.60096	1991-06-01	NG	65.3	4.6%	1.3%	20*	\$115,000	N	CRIS (S/W): 57.4 MW / 72.1 MW Voltage at substation: 115 kV Local TO substation: Oneinda			Acreage: Parcel zoning: M1: Manufacturing Assets (Buildings, Rail, Roads, Water): NY-5, Water, Rail (near)

Non-Governmental Plants (e.g., IPPs, IOUs, etc.) – Slide 5 of 5

Simple Power Plant Name	Owner/Operator	City/town	NYISO Zone	GIS Coordinates	Plant Vintage (Oldest Unit)	Primary Fuel	Nameplate Rating (MW)	2018 Capacity Factor (Aggregate)	2019 Capacity Factor (Aggregate)	Jobs	Local Property Taxes (\$ per year)	Located in Potential EJ Area?	Grid Infrastructure	Potential Clean Energy Associated w/ Site	Active Repowering Proposal	Site Information
Castleton Energy Center	Castleton Power, LLC	Castleton	F	42.53955, -73.74521	1992-01-01	NG	72	20.8%	20.5%		\$315,000	N	CRIS (S/W): 69.0 MW / 86.6 MW Voltage at substation: 115 kV Local TO substation: Castleton			Acreage: Parcel zoning: I (industrial) Assets (Buildings, Rail, Roads, Water): Moordener Kill (river)
Selkirk	Selkirk Cogen Partners, L.P.	Selkirk	F	42.5744, -73.8592	1992-03-01	NG	446	10.6%	3.4%		\$442,000	N	CRIS (S/W): 373.4 MW / 487.7 MW Voltage at substation: 115kV Local TO substation: JMC2+9TP			Acreage: 15.7 Parcel zoning: Heavy Industrial (I) Assets (Buildings, Rail, Roads, Water): NYS Route 32
Batavia	Seneca Power Partners / Alliance Energy Group	Batavia	в	42.9828, -78.1592	1992-06-01	NG	67.3	6.0%	1.6%	25*	\$175,000	N (but interim DAC)	CRIS (S/W): 57.1 MW / 71.7 MW Voltage at substation: 115 kV Local TO substation: Senecap 115 kV			Acreage: Parcel zoning: Likely industrial Assets (Buildings, Rail, Roads, Water): NY-63, Rail (near)
Rensselaer	Castleton Commodities Int'l	Rensselaer	F	42.62534, -73.75008	1993-12-01	NG	96.9	0.5%	0.4%	34*	\$165,000	N (but interim DAC)	CRIS (S/W): 79 MW / 79 MW Voitage at substation: 34.5kV Local TO substation: Resselaer			Acreage: Parcel zoning: I-2 (proposed) Assets (Buildings, Rail, Roads, Water): Hudson River, Hwy 20, Sprague Energy Power Station
Indeck-Olean	Indeck Energy Services	Olean	A	42.08594, -78.45425	1993-12-01	NG	90.6	16.0%	14.8%	25*	\$570,000	N (near interim DAC)	CRIS (S/W): 79.4 MW / 88.5 MW Voltage at substation: 115 kV Local TO substation: Olean			Acreage: Parcel zoning: 12- General Industrial Assets (Buildings, Rail, Roads, Water): Southern Tier Exov
Saranac Energy	TransAlta Energy Marketing (U.S.) Inc.	Plattsburgh	D	44.7132, -73.4557	1994-06-01	NG	285.6	2.8%	3.1% Draf	<sup>80•</sup>	\$420,000 <b>erial</b>	N (near interim DAC)	CRIS (S/W): 253.7MW / 298.4 MW Voltage at substation: 115 kV Local TO substation: NorthEnd			Acreage: Parcel zoning: I Assets (Buildings, Rail, Roads, Water): Adirondack Northway, Water. Rail

### Public Plants (e.g., NYPA, LIPA, munis., etc.) - Slide 1 of 4

Simple Power Plant Name	Owner/Operator	City/town	NYISO Zone	GIS Coordinates	Plant Vintage (Oldest Unit)	Primary Fuel	Nameplate Rating (MW)	2018 Capacity Factor	2019 Capacity Factor	Jobs	Local Property Taxes (\$ per year)	Located in Potential EJ Area?	Grid Infrastructure	Potential Clean Energy Associated w/ Site	Site Information
Barrett	National Grid	Island Park	к	40.61, -73.65	1956-11-01	NG	669.2	24.5%	24.3%		\$42,000,000	N (very near)	CRIS (S/W): 695.1 MW / 780.3 MW Voltage at substation: 138 kV Local TO substation: Barrett	OSW landing point for Empire Wind 2	Acreage: 127 acres Parcel zoning: Assets (Buildings, Rail, Roads, Water): Rail, Water
Northport	National Grid	Northport	к	40.92357, -73.34232	1967-03-01	NG	1,564	19.6%	14.8%		\$46.000.000	N	CRIS (S/W): 1,603.2 MW / 1,607.4 MW Voltage at substation: 138 kV Local TO substation: Northport		Acreage: 275 Parcel zoning: Assets (Buildings, Rail, Roads, Water): LI Sound (water)
Port Jefferson	National Grid	Port Jefferson	к	40.9497, -73.07851	1958-11-01	FO6	498	8.8%	7.3%		\$32,000,000	N	CRIS (S/W): 494.4 MW / 514.5 MW Voltage at substation: 138 kV Local TO substation: Port Jefferson	Storage	Acreage: Parcel zoning: WP Assets (Buildings, Rail, Roads, Water): LI Sound (water), NY-25A
Southampton	National Grid	South Hampto	к	40.9, -72.38198	1963-03-01	FO2	11.5	1.5%	2.1%			N	CRIS (S/W): 10.3 MW / 13.5 MW Voltage at substation: 69 kV Local TO substation: Southhampton	Storage	Acreage: Parcel zoning: LI40–Light Industrial Assets (Buildings, Rail, Roads, Water): Southampton Bypass, LIRR (Southampton)
Shoreham	National Grid	Shoreham	к	40.95429, -72.86716	1971-07-01	FO2	171.5	0.7%	0.4%		\$1,500,000	N	CRIS (S/W): 156.7 MW / 176.7 MW Voltage at substation: 138 kV Local TO substation: Shoreham/ Wildwood/Brookhaven		Acreage: 57 Parcel zoning: A Assets (Buildings, Rail, Roads, Water): LI Sound (water)
Southold	National Grid	Southold	к	41.1059, -72.3761	1964-08-01	FO2	14	<b>D</b> <sup>1.5%</sup>	ft Mo	iteria	\$106,000	N	CRIS (S/W): 12.3 MW / 16.1 MW Voltage at substation: 69 kV Local TO substation: Southhold/Peconic		Acreage: Parcel zoning: Assets (Buildings, Rail, Road Water): Moores Drain (water),

### Public Plants (e.g., NYPA, LIPA, munis., etc.) - Slide 2 of 4

Simple Power Plant Name	Owner/Operator	City/town	NYISO Zone	GIS Coordinates	Plant Vintage (Oldest Unit)	Primary Fuel	Nameplate Rating (MW)	2018 Capacity Factor	2019 Capacity Factor	Jobs	Local Property Taxes (\$ per year)	Located in Potential EJ Area?	Grid Infrastructure	Potential Clean Energy Associated w/ Site	Site Information
East Hampton	National Grid	E Hampton	к	40.96171, -72.21028	1962-12-01	FO2	27.3	5.8%	6.1%			N	CRIS (S/W): 25.2 MW / 30.4 MW Voltage at substation: 69 kV Local TO substation: Buell/Bridgehampton		Acreage: Parcel zoning: A or Cl Assets (Buildings, Rail, Roads, Water): LIRR (near), water
Glenwood	National Grid	Glenwood	к	40.8275, -73.6478	1967-04-01	FO2	232	4.5%	4.0%		\$23,000,000	N (near interim DAC)	CRIS (S/W): 206.3 MW / 259.0 MW Voltage at substation: 138 kV Local TO substation: Shore Road	Storage	Acreage: plant–0.5 acre; plot–28 acres Parcel zoning: Assets (Buildings, Rail, Roads, Water): Hempsted Bay (water)
Holtsville	National Grid	Holtsville	к	40.81704, -73.06627	1974-07-01	FO2	567	0.9%	0.4%		\$18,400,000	N	CRIS (S/W): 550.2 MW / 699.7 MW Voltage at substation: 138 kV Local TO substation: 8kW West Bus/Holbrook	Storage	Acreage: Parcel zoning: L Industrial 1 Assets (Buildings, Rail, Roads, Water): LI Expy
West Babylon 4	National Grid	West Babylon	к	40.694797, - 73.351909	1971-08-01	FO2	52.4	0.4%	0.7%		\$1,200	N	CRIS (S/W): 49 MW / 64 MW Voltage at substation: 69 kV Local TO substation: West Babylon	Storage	Acreage: 3-acre substation Parcel zoning: G–Light Industrial District Assets (Buildings, Rail, Roads, Water): Santapogue Creek
Far Rockaway (Bayswater and Jamaica Bay Energy Centers	Hull Street	Queens	I	40.6097, - 73.7622	7/1/2002	FO2 KE	121	14.20%	12.00%		\$2,600,000	Y	CRIS (S/W): 108.9 MW / 148.8 MW Voltage at substation: 69 kV Local TO substation: Far Rockaway	Storage	Acreage: Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): Motts Basin, Bayswater Energy Center
Greenport (Hawkeye)	Haugland Group	Greenport	к	41.10603, -72.37616	2003-07-02	F02	54	5.10%	6.40%		\$565,000	N	CRIS (S/W): 51.9 MW / 52.4 MW Voltage at substation: 69 kV Local TO substation: Southhold/Peconic		Acreage: Parcel zoning: P-D Park District Assets (Buildings, Rail, Roads, Water): NY-25
Wading River	National Grid	Shoreham	к	40.95, -72.86	8/1/1989	FO2	238.5	0.60%	0.50%		\$13,200,000	N	CRIS (S/W): 243.8 MW / 318.5 MW Voltage at substation: 138 kV Local TO substation: Shoreham		Acreage: Parcel zoning: Assets (Buildings, Rail, Roads, Water): LI Sound, NY 25-A
Pilgrim (Edgewood)	J-Power	Brentwood	к	40.7861, -73.2931	8/1/2002	NG	100	<sup>12</sup> Di	aft"l	Лate	rial	Y	CRIS (S/W): 91.8 MW / 91.8 MW Voltage at substation: 69 kV Local TO substation: Brentwood		Acreage: Parcel zoning: Residential Assets (Buildings, Rail, Roads, Water): N/A

### Public Plants (e.g., NYPA, LIPA, munis., etc.) - Slide 3 of 4

Simple Power Plant Name	Owner/Operator	City/town	NYISO Zone	GIS Coordinates	Plant Vintage (Oldest Unit)	Primary Fuel	Nameplate Rating (MW)	2018 Capacity Factor	2019 Capacity Factor	Jobs	Local Property Taxes (\$ per year)	Located in Potential EJ Area?	Grid Infrastructure	Potential Clean Energy Associated w/ Site	Site Information
Pouch	NYPA	Staten Island	ſ	40.6182, -74.06849	2001	NG	47	14.50%	12.10%	4		Ŷ	CRIS (S/W): 47 MW / 47 MW Voltage at substation: 138 kV Local TO substation: Fox Hills	See PEAK MOU; NYPA VISION2030	Acreage: 1.15 Parcel zoning: M2-1 Assets (Buildings, Rail, Roads, Water): Water
Vernon Blvd.	NYPA	Queens	1	40.7537, -73.9508	2001	NG	94	7.8%	4.3%	4		Y	CRIS (S/W): 90 MW / 90 MW Voltage at substation: 138 kV Local TO substation: Vernon	See PEAK MOU; NYPA VISION2030	Acreage: 3.27 Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): East River, Ed Koch Queensboro Bridge (river)
Kent/North 1st	NYPA	Brooklyn	I	40.7171, -73.9664	2001	NG	47	13.0%	7.7%	4		Y	CRIS (S/W): 46.9 MW / 46.9 MW Voltage at substation: 138 kV Local TO substation: North/1st River St., ConEd	See PEAK MOU; NYPA VISION2030	Acreage: 1.35 Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): East River
Gowanus 5-6/Joseph Seymour Power Plant	NYPA	Brooklyn	I	40.66306, -73.99992	2001	NG	94	14.6%	9.3%	4		Y	CRIS (S/W): 91.5 MW / 91.5 MW Voltage at substation: 138 kV Local TO substation: Gowanus 138 kV	See PEAK MOU; NYPA VISION2030	Acreage: 1.65 Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): Gowanus Canal, I-278
Harlem River Yard	NYPA	Bronx	ı	40.7991, -73.9156	2001	NG	94	5.0%	3.5%	4		Y	CRIS (S/W): 91.2 MW / 91.2 MW Voltage at substation: 138 kV Local TO substation: Hellgate Annex 138 kV	See PEAK MOU; NYPA VISION2030	Acreage: 1.83 Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): East River, I-278, Randall's Island Connector
Hell Gate	ΝΥΡΑ	Bronx	ſ	40.799, -73.9094	2001	NG	94	4.9%	3.5%	4		Y	CRIS (S/W): 90 MW / 90 MW Voltage at substation: 138 kV Local TO substation: Hellgate Annex 138 kV	See PEAK MOU; NYPA VISION2030	Acreage: 2.64 Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): East River
Brentwood	NYPA	Islip/ Suffolk County	к	40.7865, -73.2927	2001	NG	47	Draj	ft Mc	iteria	p/	Y	CRIS (S/W): 47.1 MW / 47.1 MW Voltage at substation: 69 kV Local TO substation: Brentwood LIPA on 69 kV	See NYPA VISION2030	Acreage: 4.4 Parcel zoning: Assets (Buildings, Rail, Roads, Water): Edgewood Energy Power Station (nearby)

### Public Plants (e.g., NYPA, LIPA, munis., etc.) - Slide 4 of 4

Simple Power Plant Name	Owner/Operator	City/town	NYISO Zone	GIS Coordinates	Plant Vintage (Oldest Unit)	Primary Fuel	Nameplate Rating (MW)	2018 Capacity	2019 Capacity	Jobs	Local Property Taxes (\$ per year)	Located in Potential EJ	Grid Infrastructure	Potential Clean Energy Associated w/ Site	Site Information
Astoria CC 1 and 2 (Zeltmann)	NYPA	Queens	ſ	40.7889, -73.9069	2006-01-01	NG / ULSD	576	42.4%	48.7%	47		Y	CRIS (S/W): 492 MW / 540 MW Voltage at substation: 138 kV Local TO substation: Astoria West 138 kV	See: NYPA VISION2030	Acreage: 46.8 for full complex Parcel zoning: Assets (Buildings, Rail, Roads, Water): East River
Astoria Energy II	Astoria Energy LLC / Eastern Gen. Co.	Queens	1	40.78132, -73.89662	2011-07-01	NG	660	47.6%	47.1%		\$577,000	Y	CRIS (S/W): 576.0 MW / MW Voltage at substation: Local TO substation:	See: NYPA VISION2030	Acreage: Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): East River
Flynn	NYPA	Holtsville	к	40.8158, -73.064	1994-05-01	NG / ULSD	170	42.7%	26.2%	18		N	CRIS (S/W): 135 MW / 168.4 MW Voltage at substation: 138 kV Local TO substation: Holtsville Substation	See: NYPA VISION2030	Acreage: 15.87 Parcel zoning: L Industrial 1 Assets (Buildings, Rail, Roads, Water): LI Expy
Freeport	Freeport Electric	Freeport	к	40.6561, -73.5922	1949-08-01	FO2	29.2	0.10%	0.10%			Y	CRIS (S/W): 125.2 MW / 128.2 MW Voltage at substation: Local TO substation:		Acreage: Parcel zoning: Industrial Assets (Buildings, Rail, Roads, Water): Sunrise Hwy, Rail
Freeport Equus Power	Freeport Electric	Freeport	к	40.6439, -73.5683	2004-03-01	NG	60.5	5.0%	2.5%		\$600,000	N (near interim DAC)	CRIS (S/W): 50.3 MW / 50.3 MW Voltage at substation: 69 kV Local TO substation:		Acreage: Parcel zoning: Industrial B Assets (Buildings, Rail, Roads, Water): Meadowbrook State Pkwy, Stadium Park Canal
Charles P Keller	Village of Rockville Cer	Rockville Cent	к	40.6331, -73.6375	1942-09-01	FO2	31.4	0.70%	0.30%			N (near interim DAC)	CRIS (S/W): 31.1 MW / 31.1 MW Voltage at substation: Local TO substation:		Acreage: Parcel zoning: Assets (Buildings, Rail, Roads, Water): N/A
Jamestown	Jamestown BPU	Jamestown	A	42.09375, -79.24808	1951-08-01	NG	101	15.20%	18.40%		\$160,000	Y	CRIS (S/W): 85.4 MW / 85.4 MW Voltage at substation: Local TO substation:		Acreage: Parcel zoning: L-M Light Manufacturing Assets (Buildings, Rail, Roads, Water): Chadakoin River, Rail (near)
Greenport	Village of Greenport	Greenport	к	41.10111, -72.37194	1957-06-06	FO2	6.8	<b>D</b> ra	ft 🕅	ater	ial	N	CRIS (S/W): 58.0 MW / 58.5 MW Voltage at substation: Local TO substation:	See: NYPA VISION2030	Acreage: Parcel zoning: B Assets (Buildings, Rail, Roads, Water): Water and rail near

# Power Plant Inventory: Your Feedback

Incorporating additional data and considerations from JTWG, members of the public

### > This inventory is still a working and preliminary draft

• Updates and refinements will need to be made, and likely additional data to consider and incorporate

### > Provide us your feedback

- As we continue to update the inventory, we want to hear your input.
  - What data assembled needs to be updated/corrected?
  - What plants not on the list should be considered?
  - What plants on the list should be considered for removal?
  - What are other elements that could make the inventory more valuable to you?
- Send any comments on the inventory (and on the list of Issues and Opportunities) to jtwg@nyserda.ny.gov

# Preview for 3/23 JTWG Meeting: Research from Emily Grubert, Georgia Tech

### Fossil electricity retirement deadlines for a just transition – Emily Grubert, 2020 (link)

The future of United States fossil fuel-fired electricity

Environmental and labor implications of retiring generators at the end of their typical lifespans

Analysis: E. Grubert, Georgia Tech. Web map implementation: R. Phillips. 2020.



Interactive Mapping Tool: <u>http://emilygrubert.org/wp-content/uploads/2020/12/fossil\_transition-script.html</u>

### **Energy-Intensive and Trade-Exposed** Industries

**Preliminary Identification Results** 



Identifying Energy-Intensive and Trade Exposed (EITE) Industries (Business Impacts Subgroup)

- Recap of Process
- Preliminary Findings

# Reminder: EITE Industries - Concept

- > <u>Energy-intensive</u>: industries that consume a high amount of energy (electricity, fuel, etc.) relative to the value of their economic output. (*Example: chemical manufacturing*)
  - Historically, due to a lack of clean power, "energy-intensive" has also meant "emissions-intensive."
- > <u>Emissions-intensive</u>: industries that emit a high level of greenhouse gases relative to the value of their economic output. (*Example: cement manufacturing*)
  - May consider emissions of multiple types electricity use, fuel combustion and industrial processes.
- > <u>Trade-exposed</u>: industries in highly competitive markets with price-sensitive customers.
  - Often measured by the extent to which products are bought and sold across borders as opposed to industries whose customers cannot easily switch to competitors outside of the jurisdiction. (*Example: cut and sew apparel manufacturing vs. local retail stores*)
  - Less able to charge higher prices for their products because customers have access to numerous competitive substitutes and will simply shift their purchases away from any higher-cost producer.

# **Reminder: EITE Industries - Implications**

- > Industries that are both "EI" (in one or both forms) and "TE" may be most sensitive to leakage in jurisdictions with stricter emission controls and clean energy policies.
- > This risk stems from the fact that:
  - Due to their "EI" status, without mitigation, the sector will face the highest costs of compliance relative to their size with respect to energy or emission policies; and
  - Due to their "TE" status, the sector has the least ability to pass those costs along to their consumers, meaning that they may, over time, shift production away from high compliance cost jurisdictions.
- > As a result of these factors, jurisdictions seeking to enact significant energy or emission policies have sought to identify and protect EITE subsectors from leakage.

# Reminder: EITE Industries - Steps to Identify

- > Several governments which have previously pursued large-scale industrial emission reduction schemes have sought to identify EITE industries, including the United States, the European Union, Australia, Canada and the State of California.
- > Steps to identify EITEs generally included:
  - 1. Define a set of industry activities to measure;
  - 2. Select metrics and quantify each industry's energy intensity, emissions intensity and exposure to trade;
  - 3. Set thresholds for qualifying as energy-, emission- and/or trade-intensive; and
  - 4. Determine which industry activities should be treated as "EITE" based on their energy intensity, emissions intensity and/or trade exposure.

# Reminder: Step 1. Working Industry Classification: NAICS

- > U.S., Canada and California identified EITE industries based on "NAICS" code.
- > NAICS codes refer to the North American Industry Classification System (NAICS), a list of industry definitions maintained by the U.S. Census Bureau.
- > EITE industries have historically been concentrated in Manufacturing and Mining, but they may include certain others such as Data Centers.
- > Where operating under an "EITE industry" is expected to convey a benefit, the NAICS code claimed by a business for an operating location should include government assignment or validation.



# Reminder: Step 2. Measures for Identifying "EITE" Sectors

A. Energy intensity: the ratio of an industry's energy costs relative to its size, or economic activity.

\$ Cost of Electricity + \$ Cost of Fuel
\$ Value of Shipments, Sales or Revenue

= % Energy Intensity

**B.** Emissions intensity: the ratio of an industry's *emissions produced* relative to its *size*, or economic activity.

<u>Emissions (tCO2e) x \$ Value of Carbon</u> \$ Value of Shipments, Sales or Revenues

= % Emission Intensity

<u>C. Trade exposure:</u> the ratio of an industry's cross-border *trade activity* relative to its total market *size*.

\$ Imports + \$ Exports = % Trade Exposure
\$ Value of Shipments, Sales or Revenues + \$ Imports

# Reminder: Steps 3-4: Set Thresholds and Assess Which Industries Qualify as EITE



U.S. ACES Example:

Industries generally qualified as EITE if they met at least one of two tests:

- >5% Energy or Emissions Intensity; AND >15% Trade-Exposed; OR
- >20% Energy or Emissions Intensity

### Select EITE Sectors Under U.S. ACES Definition

- Aluminum Production
- Cement Manufacturing
- Chemical Manufacturing
- Glass Manufacturing
- Iron, Copper and Nickel Ore Mining
- Iron and Steel Mills
- Paper, Pulp & Newsprint Mills
- Semiconductor Manufacturing

*Source:* Energy Intensity, Trade Intensity, and Emissions of U.S. Manufacturing Sectors at the Six-Digit NAICS Code Level, Federal Interagency Report on International Competitiveness and Emission Leakage in Energy-Intensive Trade-Exposed Industries, Figure 2, p. 11 (December 2, 2009).

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# Identifying EITE Industries: Examples of Different EITE Definitions

Characteristic under EITE Definition	U.S. (ACES)	California	Canada
EITE Qualification Criteria*	<ul> <li>a) &gt;5% Energy or Emissions Intensity; and &gt;15% Trade- Exposed; OR</li> <li>b) &gt;20% Energy or Emissions Intensity</li> </ul>	High Risk of Leakage = Emissions >1,000 tCO2e per \$USD million of value added; and Trade Exposure >19%	Medium or High Risk of Leakage = a) ≥1% Emissions Intensity; and ≥10% Trade-Exposed; OR b) ≥3% Emissions Intensity; OR C) >80% Trade Exposed
EITE Industries	35	61	109

*Note: Criteria may be subject to statutory or regulatory exceptions and additions.* 

Identifying Energy-Intensive and Trade Exposed (EITE) Industries (Business Impacts Subgroup)

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# Reminder: Objective

Climate Leadership and Community Protection Act, § 75-0103:

> "The Just Transition Working Group shall...Identify energyintensive industries and related trades..."

# Identifying EITE Industries in NYS: Data Sources, Inputs and Method Limitations

### > Data Sources:

- Value of Shipments:
  - U.S. Annual Survey of Manufacturers (2018);
  - U.S. Economic Census: Mining (2017)
- Imports and Exports:
  - U.S. International Trade Commission (2018)
- Electricity and Fuel Expenditures:
  - U.S. Annual Survey of Manufacturers (2018)

### > Other Inputs:

- GHG Emission Factors (in progress)
  - NYS-specific factors are being applied to energy consumption data to estimate electricity emissions.
  - U.S.-level factors are being applied to fuel consumption data to estimate fuel combustion emissions.
  - U.S.-level data is being applied to allocate non-combustion process emissions across industries.

### > Key Method Limitations:

- Industry data available at U.S.-level only
- Industry data available for Manufacturing, Mining only
- Certain data is unavailable at 6-digit NAICS industry and was estimated based on 4-digit or 5-digit NAICS sector-level.
- Trade data is available at international-level only
- Electricity and fuel combustion GHG emissions will be based on *estimates* of amounts of electricity and fuel consumed.
- Process GHG emissions will be included only for industries likely to have significant emissions.

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### Preliminary Results: Energy Intensity by U.S. Industry – Top 30 (2018)



Energy Intensity % of U.S. Industries (2018)

Source: Business Impacts Subgroup Staff Working Group Analysis.

Note: Energy intensity is defined as the sum of fuel and electricity expenditures by each industry divided by its value of shipments.

#### DRAFT / PRELIMINARY / FOR DISCUSSION ONLY

### Preliminary Results: Trade Intensity by U.S. Industry – Top 30



Source: Business Impacts Subgroup Staff Working Group Analysis

Note: Trade intensity is defined as each industry's sum of imports and exports divided by the sum of its value of shipments and imports.

# *Discussion:* Reflections on Preliminary EITE Analysis

## **Jobs Study Update**

### **BW Research**







NYSERDA JTWG – Jobs Study: March 3, 2021 Update





[bw] RESEARCH PARTNERSHIP

#### **JTWG March 3, 2021**

### Project Objectives

### **Project Objectives & Order of Operations**

- 1. Develop structure & framework of the employment impact model (January April)
- 2. Produce the initial employment model outputs by industry and occupation (March October)
- Examine the workforce implications associated with model outputs & scenarios (September – December)

**JTWG March 3, 2021** 

**Employment Impact Model** 

### **Employment Impact Model Approach**

- 1. Sectoral model developed iteratively
- 2. First three sectors will be modeled at subsector level and account for 80%+ of GHG emissions
- Model outputs will produce changes in employment by industry and occupation for 2020 – 2050 (5-year increments) overall for the State of NY and each of the 10 REDC's.

### **Modeling Framework Overview**



**JTWG March 3, 2021** 

### **Next Steps**

I. Finalize sector and sub-sector delineation and prioritization

II. Determine which workforce analyses should be included in the third phase

III. Begin work on modeling subsectors in the Electricity Sector

# **Next Steps**



# **Next Steps**

### **Upcoming milestones**

- > Next JTWG meeting: March 23, 2021
- > Next CAC meeting: April 12, 2021
- > WG feedback on integration analysis assumptions: March 31
  - Assumptions available in Integration Analysis section of the Resources page the CLCPA website: <u>https://climate.ny.gov/Climate-Resources</u>