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September 14, 2022

Climate Leadership and Community Protection Act (CLCPA)

Mohawk Valley Environmental Information Exchange
September 2022 Meeting

Kyle C. Williams, P.E.

Agenda

- CLCPA Overview
- GHG Emissions
- CLCPA Analysis
- Case Studies
- Summary and Recommendations
- PDH Questions

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CLCPA Overview

CLCPA Background

CLCPA (effective 1/1/2020) established that New York will achieve a carbon neutral economy by mandating at least:

- **40%** reduction in emissions below 1990 levels by **2030**
- **70%** renewable electricity by **2030**
- **85%** reduction in emissions below 1990 levels by **2050**
- **100%** zero-carbon electricity by **2040**

Also…

- 6,000 MW of distributed solar by 2025
- 185 TBtu on-site energy savings by 2025
- 3,000 MW of energy storage by 2030
- 9,000 MW of offshore wind by 2035
- Commitments to climate justice and just transition

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CLCPA: Climate Action Council (CAC)

- 22-Member Committee
- Responsible for preparing Scoping Plan to achieve clean energy and GHG emission reductions
- Co-Chairs:
  - NYSERDA President
  - NYSDEC Commissioner
- State Agencies and Authorities Representation
- Appointees

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CLCPA: Advisory Panels & Workgroups

- Agriculture & Forestry
- Energy Efficiency & Housing
- Energy-Intensive & Trade-Exposed Industries
- Land Use & Local Government
- Power Generation
- Transportation
- Waste
- Just Transition Working Group

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Scoping Plan Required under the CLCPA

- Scoping Plan to meet statutory emission limits
- Draft Plan issued 12/30/21 and identifies strategies by Sector for decarbonization
- 351 Pages plus 8 Appendices
- Final Scoping Plan due to governor by **01/01/2023**

CLCPA Timeline

Process for Draft Scoping Plan Development

- Draft Plan informed by recommendations of Advisory Panels, Just Transition Working Group, and Climate Justice Working Group
- Reflects the consensus recommendations from the Advisory Panels and (JTWG) as the strategies to achieve the emissions limits
- Considered climate justice, job creation, cost reductions, public health benefits, minimizing emission leakage

Key Strategies

- Transition from fossil fuels to electrification in buildings
- Zero emissions electricity
- Transportation electrification
- Enhancement of transit, smart growth, and reduced vehicle miles traveled (VMT)

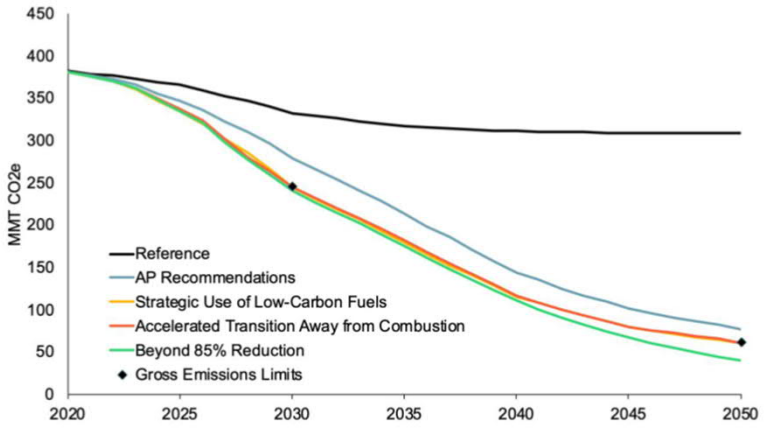
Key Strategies (Cont.)

- A transition to low-GWP refrigerants and enhanced refrigerant management
- Maximizing carbon sequestration in NY's lands and forest
- Eliminate fugitive methane emissions across the waste, agriculture, and energy sectors
- A diverse portfolio of solutions in industry, including efficiency, electrification, and limited and strategic use of low-carbon fuels and carbon capture technologies for certain industrial applications.

"Ensuring with legally binding certainty that emissions limits will be met" – CAC Economy wide Strategies Subgroup

Scoping Plan GHG Mitigation Scenarios

Figure 4. Greenhouse Gas Emissions by Mitigation Scenario



Source: New York State Climate Action Council Draft Scoping Plan, December 30, 2021

Current State of Scoping Plan

- Public Comment Period is Closed - Period was Extended to July 1, 2022
- Series of Public Hearings were held throughout the state in April – May 2022
- CAC continues to meet monthly
- Final Plan Due end of 2022
- Economy-wide Strategies (CAC Subgroup)
  - Carbon Pricing
  - Cap-and-Invest
  - Clean Energy Supply Standards

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GHG Emissions

Common GHGs - Global Warming Potential (GWP)

Greenhouse Gas	20-Year GWP	100-Year GWP
Carbon Dioxide	1	1
Methane	84	25
Nitrous Oxide	264	298

Source: 20-Year GWP: 6 NYCRR Part 496.5 (IPCC). 100-Year GWP: 6 NYCRR Part 231-13 (IPCC)

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Emissions by Typical User

Average Annual Gas Vehicle	4.64 MT CO2e/Vehicle	(National Average: 11,880 kWh)
Average Annual Home Energy Use	7.94 MT CO2e/Home	(National Average: 22.2 MPG, 11,520 VMT)

Source: USEPA Greenhouse Gas Equivalencies Calculator www.epa.gov/energy/greenhouse-gases-equivalencies-calculations-and-references

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Emissions by Fuel Type

Fuel Type	kg CO_2 per unit	Unit
Aviation Gasoline	8.31	gallon
Biodiesel (100%)	9.45	gallon
Compressed Natural Gas (CNG)	0.05444	scf
Diesel Fuel	10.21	gallon
Ethanol (100%)	5.75	gallon
Kerosene-Type Jet Fuel	9.75	gallon
Liquefied Natural Gas (LNG)	4.50	gallon
Liquefied Petroleum Gases (LPG)	5.68	gallon
Motor Gasoline	8.78	gallon
Residual Fuel Oil	11.27	gallon

Source: 40 CFR Part 98, Subpart C, Table C-1

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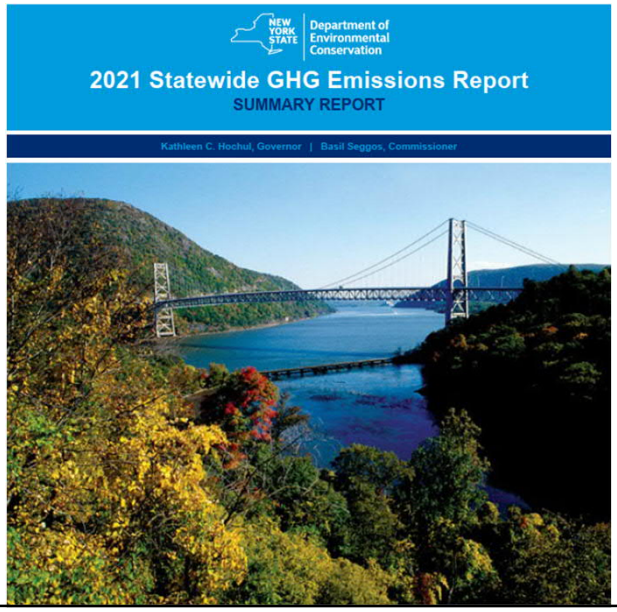
2021 Statewide Emissions Summary Report



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2019

Table ES.3: 2019 New York State GHG Emissions, by Economic Sector

CLCPA Format ($mmtCO_2e$ GWP20)	CO_2*	CH_4	N_2O	PFC	HFC	SF_6	NF_3	Total	% of Total	UNFCCC Format**
Electricity	35.65	14.99	0.08			0.13		50.85	13%	21.68
Fuel Combustion	22.03	0.04	0.05	-	-	-	-	22.12	6%	21.51
Electricity T&D	-	-	-	-	-	0.13	-	0.13	0%	0.17
Imported Fuels	5.80	14.94	0.02	-	-	-	-	20.76	5%	NA
Imported Electricity	7.81	0.01	0.02	-	-	-	-	7.84	2%	NA
Transportation	91.14	11.40	0.66		3.71			106.92	28%	72.36
Fuel Combustion	74.46	0.31	0.59	-	-	-	-	75.36	20%	70.91
Product Use	-	-	-	-	3.71	-	-	3.71	1%	1.44
Imported Fuels	17.47	10.31	0.08	-	-	-	-	27.86	8%	NA
Buildings	74.70	28.22	0.14		17.18			120.25	32%	66.00
Residential Fuel Comb.	39.38	1.27	0.07	-	-	-	-	40.72	11%	36.18
Commercial Fuel Comb.	22.35	0.33	0.02	-	-	-	-	22.70	6%	21.94
Product Use	-	-	-	-	17.18	-	-	17.18	5%	7.88
Imported Fuels	12.99	26.62	0.04	-	-	-	-	39.65	10%	NA
Industry	16.64	17.85	0.06	0.10	+	+	+	34.67	9%	16.31
Industrial Processes†	2.08	+	0.02	0.10	+	+	+	2.21	1%	2.27
Oil and Gas Industry††	1.55	14.05	+	-	-	-	-	15.60	4%	5.73
Fuel Combustion	9.08	0.07	0.03	-	-	-	-	9.18	2%	7.38
Other Uses of Fuels	0.93	-	-	-	-	-	-	0.93	0%	0.93
Imported Fuels	2.13	2.41	+	-	-	-	-	6.75	2%	NA
Waste†	3.59	41.40	0.54	-	-	-	-	45.54	12%	10.45
Waste	3.02	25.94	0.53	-	-	-	-	29.49	8%	10.45
Exported Waste	0.58	15.47	+	-	-	-	-	16.05	4%	NA
Agriculture†	0.15	19.20	1.86	-	-	-	-	21.21	6%	7.77
Gross Total	**221.89**	**133.07**	**3.35**	**0.10**	**20.89**	**0.13**	**+**	**379.43**		**194.56**
% Gross	*58%*	*35%*	*1%*	*+*	*6%*	*+*	*+*			
Net Emission Removals	(29.11)							(29.11)		(29.11)
Net Total	180.98	133.07	3.35	0.10	20.89	0.13	+	338.53		165.46
% Net	*53%*	*39%*	*1%*	*+*	*6%*	*+*	*+*			

NA Not Applicable. "+" less than 0.01mmt or less than 0.1%. Totals may not sum due to independent rounding.
*Gross CO2 emissions include biogenic CO_2. The Net total and UNFCCC total omit 11.79mmt of biogenic CO_2.
**UNFCCC Total refers to conventional accounting used by other governments, applies a 100-year GWP (IPCC 2007), omits biogenic CO_2, and does not include emissions outside of New York State.
†See previous table for sources within these emission categories.
††Oil and Gas Industry includes fuel use in pipelines and fugitive emissions within New York.

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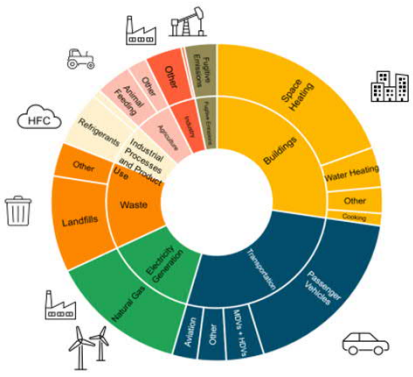
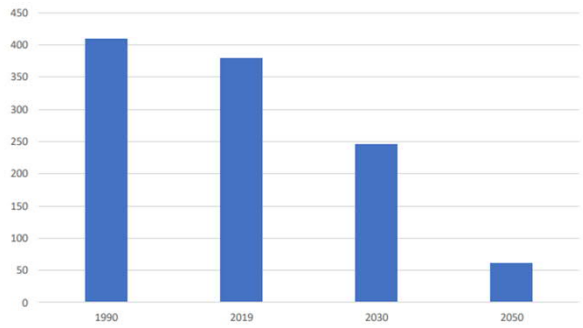
Part 496 Statewide GHG Emission Limits

- **2030 GHG Emission Limits = 245.87 Million MT CO2e (20-yr GWP)**
- **2050 GHG Emission Limits = 61.47 Million MT CO2e (20-yr GWP)**

Current Estimated GHG Emissions by Sector



New York State GHG Emissions ($MMtCO_2e$)



Source: Draft Scoping Plan Overview, CAC, January 2022

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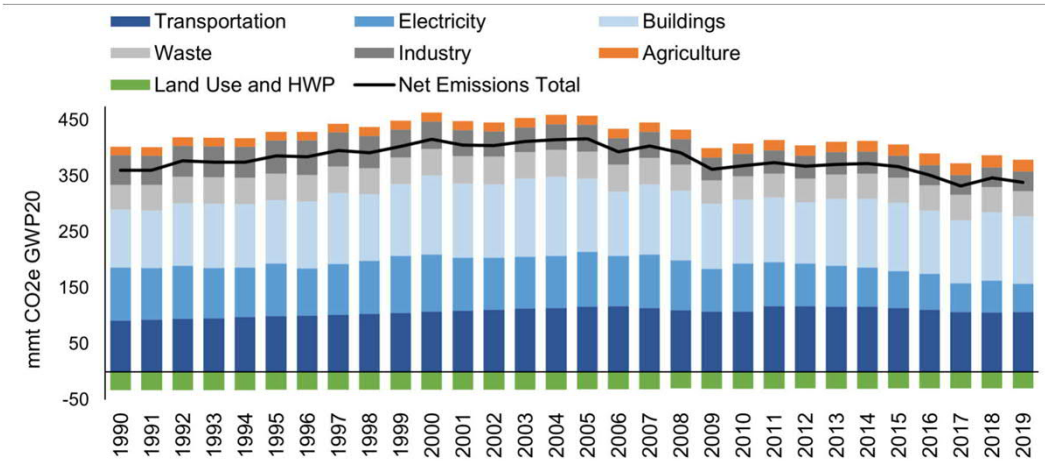
NYS Emissions by Economic Sector, 1990 - 2019



Source: 2021 NYS Statewide GHG Emissions Summary Report, Figure ES.3

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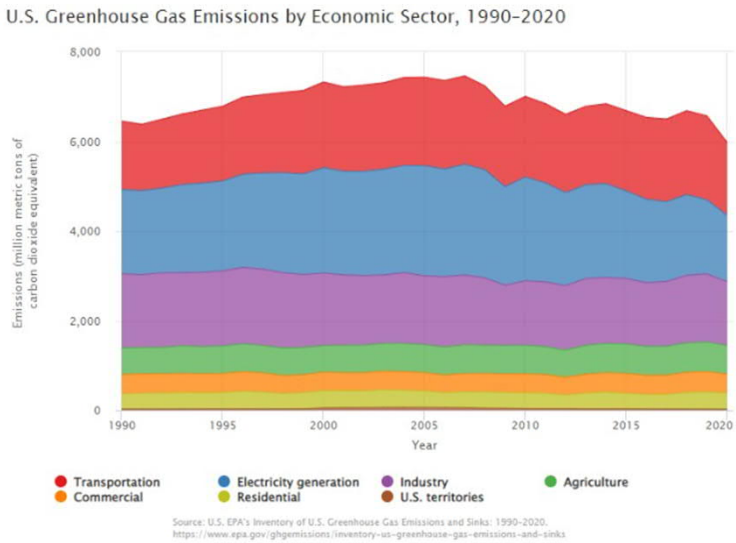
National Emissions Data by Comparison



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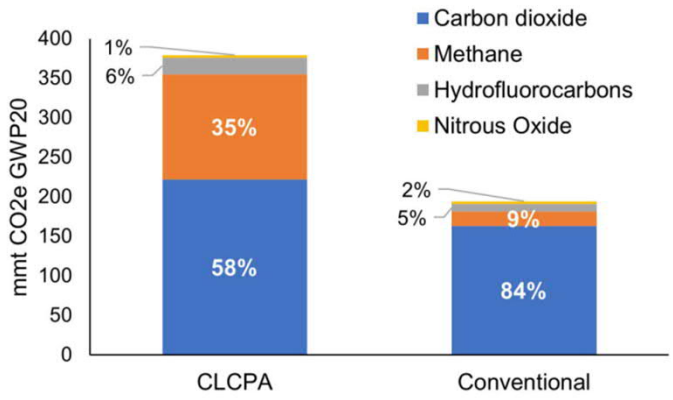
Comparison of 2019 Emissions



Source: 2021 NYS Statewide GHG Emissions Summary Report, Figure 3

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CLCPA Analysis

CLCPA Analysis

- Analysis required per requirements of Section 7(2) of the CLCPA
- Required for various permitting actions within NYS:
  - Air Permits/Registrations (Part 201)
  - Solid Waste Permits (Part 360)
  - LNG/Gas Facility Permits (Part 570)
- Independent of other reviews (NSR, Part 212)

DAR-21 Applicability

- DAR-21: NYSDEC Program Policy Document – Division of Air Resources
- Focus on Air Permits/Registrations
- **Analysis Applicability**:
  - New Title V and Air State Facility (ASF) Permits
  - Modifications to Title V and ASF Permits
  - Renewals of Title V and ASF Permits
  - Air Facility Registrations (AFRs) where DEC determines an analysis *"is necessary or appropriate to ensure CLCPA consistency"*

DAR-21 – Project Scope

- New/Modified Emission Sources that have the Potential to Emit (PTE) GHG
- Upstream, Downstream and Indirect Emissions
  - Includes upstream out-of-state emissions from fossil fuel production, transmission, and imported electricity
- Permit Renewals (no significant modification)
  - No Increase in Actual or Potential GHG Emissions
    - Consistent with CLCPA "in most cases"
    - Actual Emissions = highest 24-month average GHG emissions during 5 years preceding permit application (unless another period is more representative)
    - Push-back on this during public review

DAR-21 – Analysis Requirements

- Emission Calculations – PTE and Actual Emissions
  - Tons per year of GHG
  - Tons per year of CO2e using 20-year GWP
- Projected future GHG emissions for years 2030, 2040 (for facilities in electric generation sector), and 2050

DAR-21 – Analysis Requirements (cont.)

- Upstream Emissions
  - Fossil Fuels
  - Imported electricity
  - Not required for alternative fuels such as wood, ethanol, biodiesel, green hydrogen and RNG
  - Emission Factors in Appendix A of 2021 Statewide GHG report
- Downstream Emissions
  - Transmission and use of facility's products
  - Do not typically include emissions from shipment or use of consumer goods
- Indirect Emissions
  - Due to facility but occur at sources owned/controlled by another entity
  - Does not include upstream/downstream emissions already accounted for
  - Can be + or –
    - For Example, VMT reduction (-)

GHG Emission Inventory – RNG Facility Example

Upstream Emissions

- Extraction and transmission of Natural Gas
- Imported electricity

Direct Facility Emissions

- Natural Gas Combustion
- LFG Combustion

Downstream Emissions

- RNG transmission

GHG Emission Inventory – RNG Facility Example

SOURCE	CH4 TON/YR	BIOGENIC CO2 TON/YR	CO2 TON/YR	CO2e (20-Year GWP) TON/YR
LFG Flare (Burning Upgraded LFG)	7.3	1,987	0	2,601
Thermal Oxidizer (Burning Tail Gas & Natural Gas)	6.6	1,808	0	2,366
Upstream Natural Gas Supply	5.7	175.8	0	652
Downstream RNG Losses	5.8	0	0	484
Indirect Emissions From Electricity Usage	0.0	867	0	867
TOTAL	25	4,838	0	6,969

Source: 2021 NYS Statewide GHG Emissions Summary Report, Appendix A

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Upstream and Downstream Emission Factors

Table A1: 2019 Emission Rates for Upstream Out-of-State Sources (g/mmbtu)

Fuel Type	CO_2	CH_4	N_2O	Total CO_2e
Natural Gas	12,131	357	0.14	42,147
Diesel/ Distillate Fuel	15,164	121	0.26	25,375
Coal	3,300	364	0.10	33,891
Kerosene/Jet Fuel	10,071	109	0.17	19,270
Gasoline (E85)	5,097	33	0.08	7,905
Gasoline	19,604	128	0.33	30,405
LPG	17,295	121	0.27	27,553
Petroleum Coke	11,612	112	0.20	21,096
Residual Fuel	11,799	111	0.19	21,184

Note: Total CO2e conversion uses GWP20 per 6 NYCRR Part 496

Table A3: 2019 Emission Rates for Downstream In-State Sources (g/mmbtu)

Fuel Type	CO_2	CH_4	N_2O	Total CO_2e
Natural Gas and Renewable Natural Gas (RNG/biogas)	2.0	68	n/a	5,714

Note: Total CO2e conversion uses GWP20 per 6 NYCRR Part 496

Source: 2021 NYS Statewide GHG Emissions Summary Report, Appendix A

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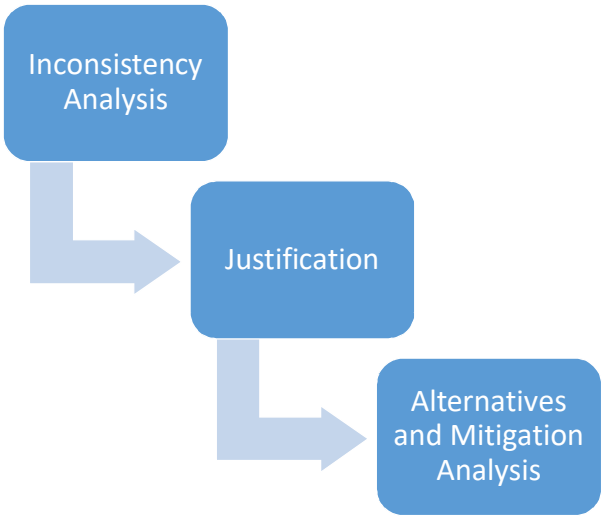
DAR-21 – Analysis Requirements



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DAR-21 – Inconsistency Analysis

- Inconsistency Analysis – Examples
  - Does not conform with Scoping Plan or Regulations
  - Creates or enables a ***"significant"*** new source of GHG emissions
  - Directly responsible for a ***"significant increase in demand for a known source of GHG emissions"***
  - Prevents or makes more difficult or expensive for the State to reduce GHG emissions
  - Facilitates the expanded or continued use of fossil fuels through infrastructure development
  - Interferes with attainment of zero-emissions electric generation by 2040

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DAR-21 – Justification Analysis

- Justification Analysis – Required if Project deemed "Inconsistent"
  - Explanation of Project portions that are consistent vs inconsistent
  - Description of environmental, economic, and/or social harm associated with the absence of the project
  - Examples:
    - Lack of project would lead to emissions leakage (out-of-state)
    - No technically feasible alternatives exist "to achieve the desired ends"
    - Project needed to improve or maintain safety and reliability of existing systems

DAR-21 – Alternatives Analysis

- Alternatives Analysis - Examples
  - Electric equipment replacement of fossil fuel equipment
  - Lower emission technologies
  - Use of alternative process technologies

DAR-21 – Mitigation Analysis

- Mitigation Analysis – Required if Project deemed "Inconsistent" but justified with no alternatives
  - Must result additional, measurable GHG emission reduction or sequestration
  - "Quantifiable, permanent, verifiable, and enforceable".
  - "Wherever possible, mitigation should result in a reduction in GHG PTE that is at least equal to increases from the project"
  - Examples
    - Financial mitigation
      - Offsets not allowable for electric generation sector
    - Technological mitigation
    - Operational mitigation
    - Physical mitigation

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CLCPA Section 7(3)

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The Department must prioritize emissions reductions in disadvantaged communities and consider burdens on disadvantaged communities.

- *To address Section 7(3) of CLCPA, the Department is required to prioritize the reduction of GHG emissions and co-pollutants in disadvantaged communities. Co-pollutants are defined as hazardous air pollutants (HAPs) that are emitted by GHG sources. A GHG source is a piece of equipment that emits GHG.*
- *Calculate the co-pollutant emissions from each GHG source and discuss any alternatives or mitigation measures that will be used to reduce the impact of those emissions.*

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CLCPA Analysis Case Studies

Case Study – Successful Major Title V Modification

- County Landfill – Bath, NY

- Title V Modification Application – lateral landfill expansion to increase air space at County owned and operated landfill
- Increase in GHG emissions
- Required to implement mitigation measures beyond current regulatory requirements to permit
  - Waste cover inspections, surface scans, wellfield monitoring

Case Study – Denied Permits

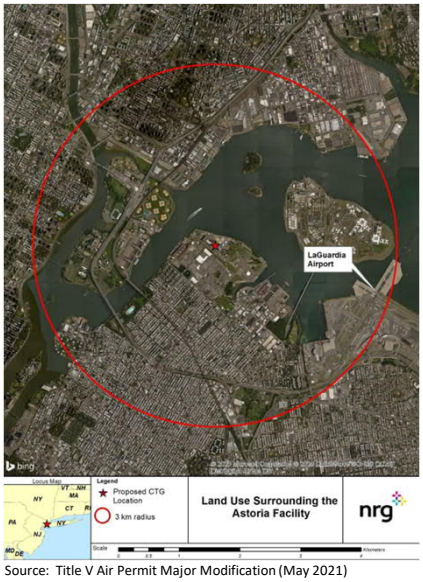
- Danskammer Energy Center – Town of Newburgh, Orange County

Source: www.danskammerenergy.com

- Mod to add New Natural Gas-Fired CoGen Facility – 536 MW
- NYSDEC Denied Title V Permit Application (10/27/2021)
  - Basis that it was inconsistent with GHG emission limits and project did not demonstrate justification or mitigation measures

Case Study – Denied Permits

- Astoria Gas Turbine (NRG Subsidiary) – Astoria, Queens County
- Mod to add Dual Fuel Fossil Fuel-Fired Peaking Combustion Turbine Generator – 437 MW
- NYSDEC Denied Title V Permit Application (10/27/2021)
  - Basis that it was inconsistent with GHG emission limits and project did not demonstrate justification or mitigation measures



Source: Title V Air Permit Major Modification (May 2021)

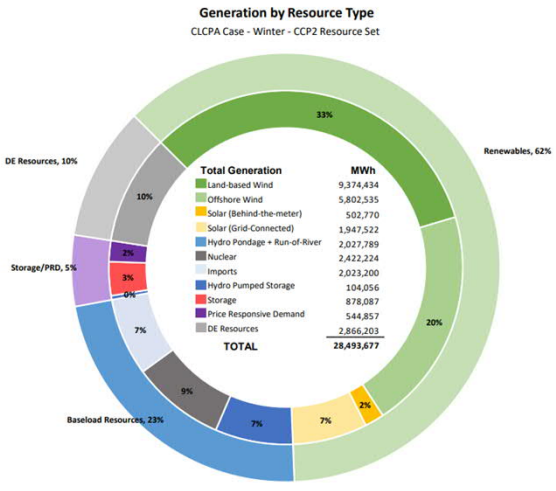
Case Study – Denied Permits

- Greenidge Generation – Dresden, Yates County

Source: AP Photo/Julie Jacobson

- Title V Renewal Application – continued use of natural gas-fired power generation.
- Change in use – from providing energy to grid to provide energy "behind-the-meter" to support cryptocurrency mining operations.
- NYSDEC Denied Title V Permit Application (06/30/2022)
  - Basis that it was inconsistent with GHG emission limits and project did not demonstrate justification or mitigation measures

Generation by Resource Type - 2040



Source: NYISO Climate Change Impact and Resilience Study – Phase II, Appendix C, Page 130 (Sep. 2020)

Gas System Transition – CAC Subgroup

- Gas System supplies 35% of state's energy
  - Buildout of electric system to accommodate transformation needs to be well planned and coordinated
- Importance of Reliability
  - Transition from conventional to intermittent renewables must preserve reliability and resiliency
- Gas distribution system should be utilized as one of a number of decarbonization tools available to the State
  - Repurpose existing gas distribution system, not decommission it
  - RNG
  - Investment in R&D (Hydrogen)

Utility Consultation Group Presentation

CLCPA Analysis and Permitting

- What does this mean for a Project?
  - Preliminary planning and consideration of GHG emissions
  - Increased project permitting costs
  - Schedule
    - Additional NYSDEC involvement and review times
    - Likely more back-and-forth with regulators
    - Plan for permitting and schedule delays
  - New regulations
    - How will this impact current projects undergoing permitting
    - CLCPA permit conditions

Common Review Comments

- Comparison to individual facility 1990 baseline is irrelevant
- Inconsistent with goals of CLCPA if increase (even "moderate")
- CRRA – Community Risk and Resiliency Act Needed
  - CLPA amended CRRA to include:
    - All Climate Hazards (not just sea-level rise, storm surge, and flooding)
    - Permits subject to UPA

Summary

- Recommendations for CLCPA Analyses
  - Start early
  - Evaluate alternatives or mitigation measures
  - Pre-application meeting with NYSDEC (Regional and Central Office)
- Regulation Development

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PDH Questions

Question #1

Q: What are the three main emission reduction targets and corresponding dates associated with the CLCPA?

A: 40% Reduction in Emissions by 2030, 85% Reduction by 2050, and 100% Zero Carbon Electricity by 2040

Question #2

Q: What is "GWP" and what basis is used for CLCPA emission inventories?

A: GWP = Global Warming Potential, used to convert emissions to a carbon dioxide equivalent basis. CLCPA uses the 20-year GWP.

Question #3

Q: T or F: A CLCPA Analysis is not required for a minor Air Facility Registration Project.

A: False…may be required if requested by NYSDEC.

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Thank You!

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