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CLCPA Analyses for Air Permitting

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Climate Leadership and Community Protection Act and DAR-21

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Climate Leadership & Community Protection Act (CLCPA)

- Signed in 2019 and became effective January 1, 2020
- Introduced several aggressive targets
  - 40% Reduction in GHG Emissions by 2030*
  - 85% Reduction in GHG Emissions by 2050*
  - 70% Renewable Energy by 2030
  - 100% Zero-emission Electricity by 2040
  - 9,000 MW of Offshore Wind by 2035
  - 3,000 MW of Energy Storage by 2030
  - 6,000 MW of Solar by 2025
  - 22 Million Tons of Carbon Reduction through Energy Efficiency and Electrification

*Compared to 1990

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Broad Scope and Engagement of CLCPA

- Climate Action Council is Leading the Transition
  - Oversees the establishment of sector-specific advisory panels and working groups
- Seven Advisory Panels including the following:
  - Power Generation
  - Energy Efficiency and Housing
  - Agriculture and Forestry
  - Transportation
- Just Transition Working Group
  - Evaluate impact of CLCPA-based changes on jobs/workforce, business leakage, etc.
- Cross-sectional Engagement of policymakers and stakeholders
  - Governmental agencies: NYSDEC, NYSERDA
  - Industrial leaders in New York based companies
  - Manufacturing organizations: MACNY
  - Union leaders and representatives
- NYSDEC Air Permit reviews for CLCPA is one part of a much larger effort!

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CLCPA Impacts to Air Permitting Process

- CLCPA requires NYSDEC to evaluate air permits to ensure they are consistent with the goals of CLCPA
  - Section 7(2) – Determination of if permitting decisions are inconsistent with, or will interfere with, the goals of the CLCPA
  - Section 7(3) – Co-pollutant and disadvantaged community evaluation
- No NYSDEC implementing rules for CLCPA analysis
- In December 2021, NYSDEC proposed *DAR-21, "The Climate Leadership and Community Protection Act and Air Permit Applications"*
- The CLCPA analysis is required to be submitted as part of most permit application packages
- The CLCPA analysis must be approved by NYSDEC prior to permit issuance
- CLCPA analyses are typically evaluated by Central Office
- CLCPA analysis process / expectations continue to evolve

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Overview of DRAFT DAR-21

- Outlines the requirements for analyses developed per Section 7(2) of CLCPA for air pollution control permit applications
- Applicability
- Project Scope
- Requirements of a CLCPA Analysis
- Considering inconsistency with the CLCPA
- Identification of alternatives and mitigation measures
- Guidance on air permit implications
- DAR-21 does not provide guidance for CLCPA Section 7(3) analysis

Applicability of an Air Permit CLCPA Analysis

- DAR-21 and CLCPA analysis requirements apply to the following permitting actions in all cases
  - New Title V and Air State Facility permits
  - Significant Modifications to Title V and ASF permits
- Air Facility Registrations, if the NYSDEC determines an analysis is necessary or appropriate to ensure CLCPA consistency
- Permit renewals are generally considered consistent with the CLCPA with these exceptions
  - Those including a significant modification
  - Specific renewals, even if no modifications are requested, if deemed required by the NYSDEC “to ensure the requirements of Section 7(2) are met”.
    - Example: Landfills and other facilities managing offsite hazardous waste

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Defining the Project Scope

- Potential *direct* GHG emissions from each portion of the project
  - New or modified emission sources that have the potential to emit GHG
  - Includes both *increases* and *decreases* of GHG emissions from existing equipment affected by the project
  - New facility: GHG emissions attributable to the entire facility
- Other emissions known to be attributable to facility / project
  - Upstream
  - Downstream
  - Indirect
- Identifying and documenting scope is critical, especially for upstream, downstream and indirect emissions

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Emissions Analysis

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GHG Emissions to Include in the Analysis

- Identify GHG's emitted from the facility
  - Products of combustion from process sources, control devices, etc.
  - Other GHGs identified in 6 CRR-NY Part 496

- Basis for emissions to include
  - Actual, projected and PTE GHG emissions on a GHG and CO_2e (20-year GWP) basis
  - DAR-21 guidance varies on actual/projected/PTE depending on the origin of emissions (direct, upstream,…)
  - Projected emissions in 2030, 2040 (electrical generation sector), and 2050

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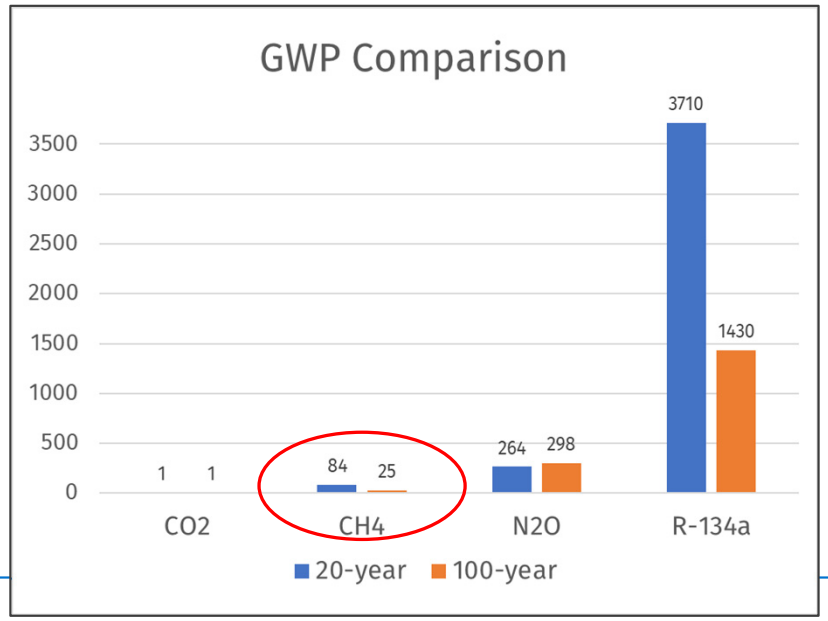
Global Warming Potential 20-year Basis

- GWP – Global Warming Potential - measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO_2 (EPA)
- CLCPA GHG analyses are based on 20-year GWP which aligns with CLCPA goal years



$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i$$

Program	GWP Timescale (years)
CLCPA	20
NYSDEC AES Reporting (6 CRR-NY 202-2)	N/A Only individual GHG are reported
EPA GHG Reporting (40 CFR 98)	100
New Source Review (6 CRR-NY 231)	100

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Direct Emissions

- Direct emissions of GHGs that are generated due to the combustion of carbon-based fuels at the facility
  - Carbon dioxide, methane, nitrous oxide
- Direct emissions of GHGs released from the process operations at the facility
  - List defined in 6 CRR-NY 496
  - Sulfur hexafluoride, nitrogen trifluoride, and others
  - Refrigerants and foam blowing agents
    - Hydrofluorocarbons (R-134a)
    - Perfluorocarbons (perfluorocyclopentene)
    - To date, the NYSDEC has not requested normal releases of refrigerant from HVAC systems to be included in CLCPA conformity analyses

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Upstream Emissions *Attributable to the Project*

- The extraction, transmission, and use of fossil fuels imported into the State
  - "Preliminary Interim Draft Emission Factors for Use by State Agencies and Project Proponents" NYSDEC Version 02/2021
  - Site-specific factors can be used with proper justification
  - Recent update: revised emission factor guidance from the NYSDEC is pending
- Generation and transmission of GHG from electricity known to be imported into the state
  - Consider: Power Purchase Agreements vs. purchasing "from the grid"
- Only includes GHG emissions from fossil fuels and imported electricity, other fuels (wood, biodiesel [B100], renewable natural gas [RNG], etc.) are not required to be incorporated
  - Blended fuels (i.e., B20, 20% biodiesel and 80% diesel) must account for fossil fuel component

Downstream & Indirect Emissions *Attributable to the Project*

- Reasonably foreseeable downstream and indirect emissions attributable to the facility's operation/project
- Downstream emission considerations and DAR-21 examples
  - Transportation/shipment of products (other than consumer goods)
  - Transmission of gaseous fuel to the end user (NYSDEC 02/2021 Interim Guidance provides GHG factors)
  - Consider: Does use of the facility's product(s) impact GHG emissions by end users?
- Indirect Emission Considerations
  - "[E]missions that are a consequence of the activities of the reporting facility but occur at sources owned or controlled by another entity", not including upstream/downstream emissions.
  - Increase in truck/forklift traffic at the facility
  - Consider: Offsite transportation of raw materials and products

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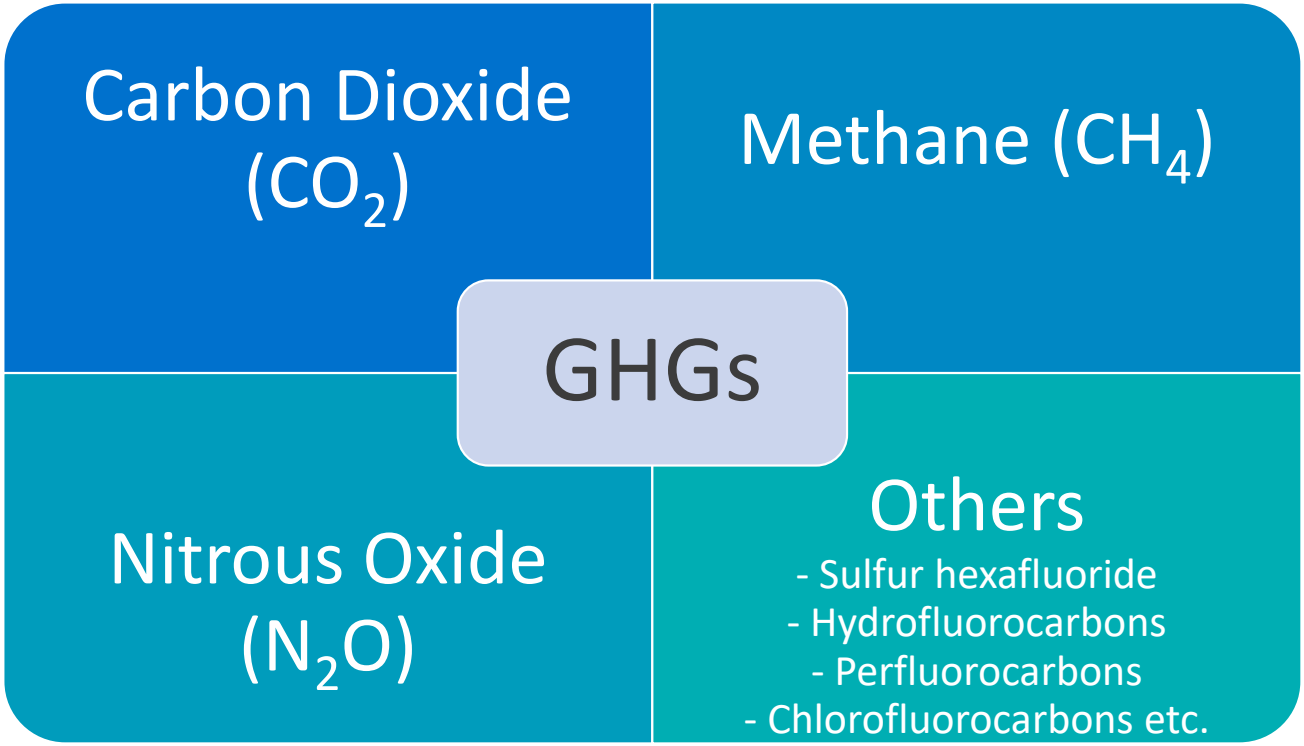
Step 1 – What GHGs Should be Included?



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Step 2 - Identify GHGs Emitting Processes For Your Project

Direct-Processes

- **From processes and activities**
  - Chemical reactions during production process
  - Wastewater treatment plants
  - Leaks from natural gas and petroleum systems

Direct – Fuel Combustion

- **Fossil fuel combustion**
  - Diesel-fired emergency generators
  - Natural gas-fired heaters, boilers, control devices (RTOs)

Upstream

- **Associated with extraction, production, and transmission of fossil fuels**
  - Fuel imported for combustion onsite
- Transportation

Downstream

- **Associated with natural gas distribution downstream**
  - Fugitive emissions within NY
- Transportation

Indirect

- **Varies considerably by facility / process**
- **One example: raw material preparation specifically attributable to the project**

Important *- List based on NYSDEC's recent guidance. There are other indirect sources of GHG emissions which may require evaluation as NYSDEC's guidance evolves.*

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Step 3 – Calculate GHG Emissions

a. Direct - Processes

- Site specific emission factors
- Publicly available emission factors
  - AP-42 Compilation of Air Emissions Factors
  - 40 CFR Part 98 Subparts, examples:
    - Subpart F – Aluminum Production
    - Subpart H – Cement Production
    - Subpart HH – Municipal Solid Waste Landfills

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Step 3 – Calculate GHG Emissions

b. Direct – Fuel Combustion

- Site specific emission factors
  - Non-traditional fuels
- Publicly available emission factors
  - AP-42 Compilation of Air Emissions Factors
  - 40 CFR Part 98 Subpart C – Stationary Fuel Combustion
- Industry group published emission factors / analysis

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Step 3 – Calculate GHG Emissions

c. Upstream

- Preliminary Interim Draft Emission Factors for use by State Agencies and Project Proponents – NYSDEC February 2021

Table 1. Current Upstream and Out-of-State Emission Factors for Imported Fossil Fuels

These factors reflect greenhouse gas emissions associated with the extraction, production, and transmission of fossil fuels imported into New York State for the most recent year available, or 2018.[3] This does not include extraction, production, or transmission of fuels within New York State.

	Greenhouse gas emission rate (g/mmbtu)*			
Fuel Type**	**CO_2**	**CH_4**	**N_2O**	**CO_2e (20 yr GWP)+**
Natural Gas	11,913	384	0.136	44,205
Diesel/ Distillate Fuel	15,164	121	0.258	25,375
Coal	3,279	397	0.103	36,650
Kerosene/Jet Fuel	10,071	109	0.170	19,270
Gasoline (E85)	5,097	33	0.085	7,905

- EPA Emission Factors Hub

Table 8 **Scope 3 Category 4: Upstream Transportation and Distribution and Category 9: Downstream Transportation and Distribution**

Vehicle Type	CO_2 Factor (kg / unit)	CH_4 Factor (g / unit)	N_2O Factor (g / unit)	Units
Medium- and Heavy-Duty Truck	1.450	0.013	0.034	vehicle-mile
Passenger Car [A]	0.332	0.007	0.007	vehicle-mile
Light-Duty Truck [B]	0.454	0.012	0.009	vehicle-mile
Medium- and Heavy-Duty Truck	0.211	0.0020	0.0049	ton-mile
Rail	0.022	0.0017	0.0006	ton-mile
Waterborne Craft	0.041	0.0183	0.0008	ton-mile
Aircraft[C]	1.165	-	0.0359	ton-mile

Red text indicates an update from the 2021 version of this document.

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Step 3 – Calculate GHG Emissions

d. Downstream

- Preliminary Interim Draft Emission Factors for use by State Agencies and Project Proponents – NYSDEC February 2021

Table 2. Current Downstream In-State Emission Factors for Natural Gas/RNG Distribution

These factors reflect fugitive emissions within New York State associated with fuel throughput for the most recent year available, or 2018.

	Greenhouse gas emission rate (g/mmbtu)			
Fuel Type	**CO_2**	**CH_4**	**N_2O**	**CO_2e (20 yr GWP)**
Natural Gas/RNG	n/a	23	n/a	1,932

Source: Emission factor generated by summing emissions from natural gas distribution reported in NYSERDA (2019) New York State Oil and Gas Sector Methane Emission Inventory and dividing by energy content of natural gas consumed in residential, commercial, and industrial sectors of New York as reported by EIA.

- EPA Emission Factors Hub

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Alternatives Analysis and Mitigation Measures

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CLCPA Analysis – Alternatives (1 of 3)

- Alternatives analysis required if:
  - The facility's CO_2e PTE, including any upstream and downstream emissions, will increase
  - The NYSDEC determines that the project would be inconsistent with or would interfere with the attainment of the Statewide GHG emission limits
- On-site combustion
  - Electrically-heated/powered equipment rather than fossil-fuel-fired equipment
  - Lower GHG intensity fuel use

GHG Intensity (Direct + Upstream)	kg CO_2e (20 yr) / MMBtu
Hydrogen	0.00
Natural Gas	97.38
No. 2 Fuel Oil	99.75

Upstream GHG emission rates based on NYSDEC February 2021 Interim Guidance

  - Can thermal efficiency of heating processes be improved?

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CLCPA Analysis – Alternatives (2 of 3)

- Direct emissions of GHG
  - Alternatives to direct use of GHG… CO_2 vs. refrigerants for foam blowing (significantly lower GWP)
- Technical evaluation of alternatives
  - Are the alternatives technically viable for the process / operation?
  - Is required infrastructure in place?
    - Utility or local electrical substation capacity
    - Hydrogen delivery infrastructure and safety
- Economic evaluation of alternatives
  - A good-faith, reasonable estimate of financial impact for those options that are technically viable

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CLCPA Analysis – Alternatives (3 of 3)

- GHG impact of each technically feasible alternative must be calculated on CO_2e basis
- Trinity takes a top-down approach to the Alternatives Analysis:
  - Focus on GHG reduction rather than emissions control for existing sources
  - Identify if less GHG-intensive technologies/fuels exist for the process
  - Identify if modifications to the existing technology could reduce fossil fuel usage
  - Evaluate the technical feasibility of each alternate technology or modification
- Trinity observation: the focus of NYSDEC review appears to be on reduction of direct GHG emissions rather than reduction in electricity used

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CLCPA Analysis – Mitigation Measures

- Evaluation of mitigation measures required if no alternatives are feasible
- "Any mitigation option must result in measurable GHG emissions reduction or sequestration that is in addition to actions already required by law or regulation."
- Mitigation measures should equal / exceed GHG increases from project
- Potential mitigation options
  - Improve capture / control of GHGs used in processes
  - Capture methane for use in on-site heat generation or flaring
  - Limit the quantity of fossil fuel combusted
  - Carbon sequestration (i.e., maintenance of forest land / carbon sinks)
  - Funding GHG reduction projects in the local community
- Mitigation measures must be permanent, quantifiable, verifiable and enforceable

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Electric Generation Sector Zero-emission 2040 Goal

- Overall goal of CLCPA: electric generation sector will be zero emissions by 2040
- CLCPA analysis for electric generation sector sources must
  - Describe how the facility intends to comply with the goal
  - Address feasibility and impacts from any alternative fuels or technologies that will be used by the facility
  - Discuss any alternatives or mitigation measures that will be implemented

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Section 7(3) Co-Pollutant Evaluation

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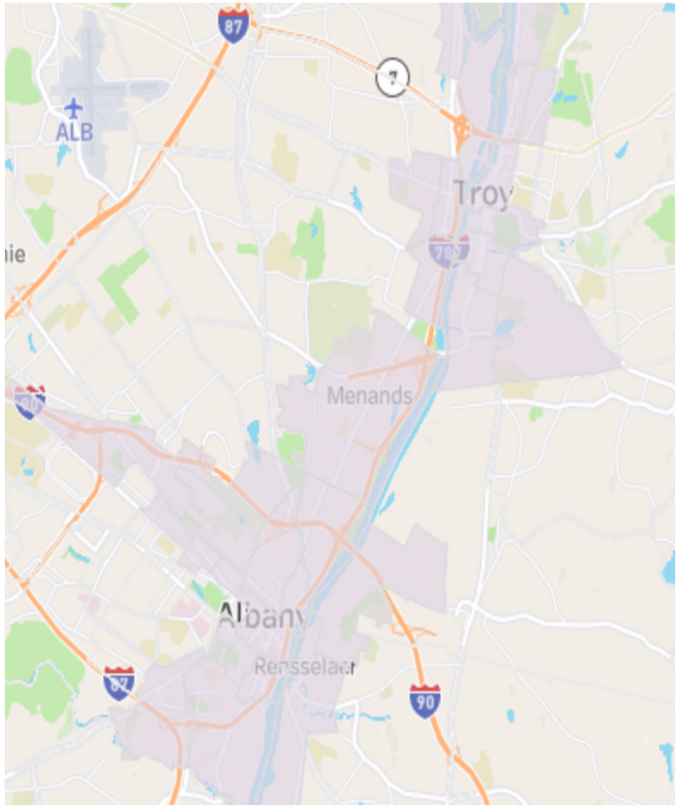
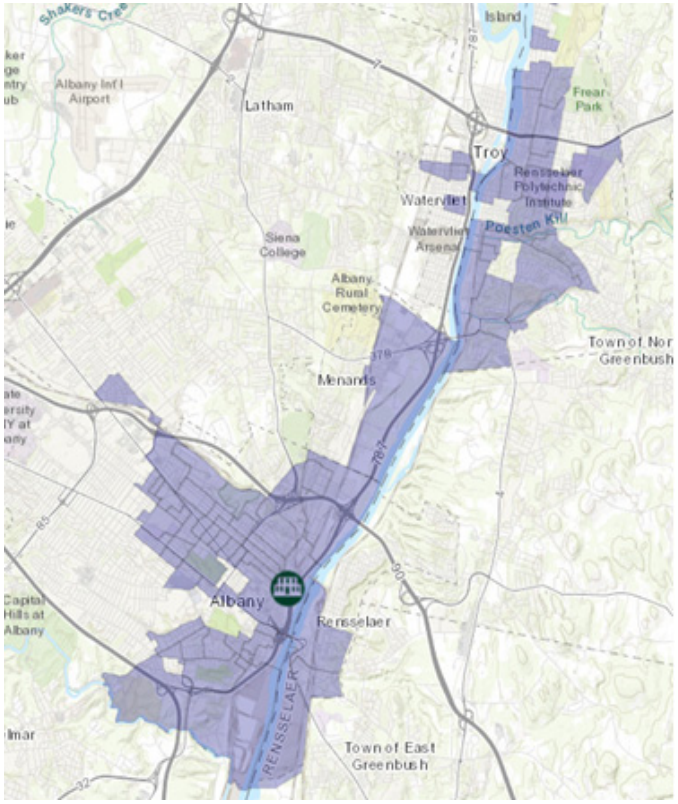
Co-Pollutants

- CLCPA defines Co-Pollutants as “hazardous air pollutants produced by greenhouse gas emissions sources”
- Section 7(3) requires an analysis of co-pollutant emissions
- NYSDEC guidance Trinity has received to date:
  - Evaluate co-pollutants which are emitted from emission sources that generate GHG
  - Co-pollutant emission evaluations can be satisfied by evaluating compliance with Part 212 and applicable NESHAPs
  - Additional focus has been given to Potential Environmental Justice Areas (PEJA) defined by NYSDEC
- Pending changes to co-pollutant guidance
  - Evaluate co-pollutants from all emission sources at a facility that generates GHGs
  - Additional focus will be given to Disadvantaged Communities. Draft list generated by the Climate Justice Working Group in May 2022.
    - The Disadvantaged Communities map varies slightly from PEJA maps

Disadvantaged Communities



Potential EJ Areas



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Air Permit Considerations

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Expectations for Your Next Air Permit Application

- CLCPA analysis is likely to be required to be submitted concurrent with permit application (few exceptions)
- Additional emissions evaluations
  - 20-year GWP CO_2e
  - Evaluation of alternatives / mitigation measures that are not planned for the project
  - If submitting CLCPA analysis separately from main application, consider submitting GHG-focused emission calculations
- Additional analysis / narrative for alternatives and mitigation measures
- Expect questions on the analysis and alternatives. Common themes to questions received:
  - Electrification of heat sources
  - Evaluation of any possible alternatives
  - Considering impacts and alternatives that were not already included in the analysis (continued evolution of process)
  - Identification of indirect sources of GHG emissions

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CLCPA Air Permit Conditions

- Air permits are currently being issued with general CLCPA condition that reflects Part 496 GHG reduction targets.
  - Example condition language in state-enforceable section:

Condition 9: CLCPA Applicability
Effective for entire length of Permit

Item 9.1:
Pursuant to The New York State Climate Leadership and Community Protection Act (CLCPA) and Article 75 of the Environmental Conservation Law, emission sources shall comply with regulations to be promulgated by the Department to ensure that by 2030 statewide greenhouse gas emissions are reduced by 40% of 1990 levels, and by 2050 statewide greenhouse gas emissions are reduced by 85% of 1990 levels.

- If an alternative or mitigation is proposed in a permit application / CLCPA analysis, it may result in permit conditions to ensure compliance

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Questions?

PDH Questions

▸ GHG emissions from direct, upstream and indirect sources must be included in CLCPA analysis.	**True**
▸ 100-year Global Warming Potential Factors are used in calculations for CLCPA.	**False**
▸ New York has established state-wide GHG emission limits.	**True**
▸ For CLCPA purposes, using natural gas heat is preferred over electric heat.	**False**
▸ DAR-21 and CLCPA analysis requirements never apply to Title V Renewals.	**False**
▸ Viable alternatives and mitigations included in a CLCPA analysis may become permit conditions.	**True**

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