Climate Pollution Reduction Grants: Co-Pollutant Inventory and Future Projections Benefits Analysis

Disclaimer

The information contained in this presentation is intended for the sole purpose of providing tools and technical assistance to planning grant recipients under EPA's Climate Pollution Reduction Grants program. Specific questions on how this information relates to a particular grantee's deliverables should be directed to that grantee's EPA Project Officer.

Nothing contained in this presentation should be construed as creating new requirements beyond those already enumerated in the CPRG planning grant program guidance or the terms and conditions that apply to the grantee.

Housekeeping Notes:

- Mics are automatically muted for all registrants and all cameras should be turned off.
- Links to additional resources will be provided in the Chat during the training.
- Please enter all questions in the chat box and “like” any questions already asked that you would also like answered. Questions will be answered during the Q&A session (*Reserved for Grantees*).
    - *Note: We can not answer any questions regarding the implementation grants at this time.*
- We encourage you to answer the poll questions which will pop-up periodically throughout the training and will also show up in the chat box (*Reserved for Grantees*).
- Slides and links to additional resources will be shared after the training with training registrants.
- A recording and Q&A document will be posted to the CPRG website after the training.

Co-Pollutant Inventory and Future Projections Benefits Analysis Training:

- Overview of CPRG Requirements on Co-Pollutant Benefits Analysis for Planning Grants.
- Why should Climate Action Plans account for co-pollutants?
- Co-Pollutant Inventory 101
  - What is an air pollution emissions inventory?
  - What is the National Emissions Inventory (NEI)?
  - How is the NEI developed and used at the EPA?
  - Introduction to NEI data
  - Online 2020 NEI Data Retrieval Tool
- Examples of Co-Pollutant Benefits Analyses

Overview of CPRG Requirements on Co-Pollutant Benefits Analysis for Planning Grants

CPRG Requirements – Co-Pollutant Benefits Analysis

Many benefits may accrue from GHG reduction measures.
Here, we'll discuss co-pollutant benefits.

Priority Climate Action Plan (PCAP) **Due (States/MSAs): March 1, 2024** **Due (Tribes/Territories): April 1, 2024**	**Comprehensive Climate Action Plan (CCAP)** **Due (States/MSAs): 2 years from award (summer-fall 2025)** **Due (Tribes/Territories): 4 years from award (summer-fall 2027)**	**Status Report** **Due (States/MSAs): 4 years from award (2027)** **N/A for Tribes/Territories**
Encouraged: Estimate co-pollutant reductions for the suite of measures included in the PCAP. Grant recipients should also track, minimize, and mitigate, to the extent possible, any potential disbenefits resulting from implementation of GHG reduction measures.	Required: Estimate co-pollutant reductions for the suite of measures included in the CCAP. Grant recipients should also track, minimize, and mitigate, to the extent possible, any potential disbenefits resulting from implementation of GHG reduction measures.	Required: Updated estimate of co-pollutant reductions for the suite of measures included in the CCAP. Updates to the potential disbenefits analysis should also be included.

EPA is not requiring a specific baseline year; inventory years should be chosen based on availability of underlying data.

Why should Climate Action Plans account for co-pollutants?

Climate Action Plans and Co-Pollutants

- Many processes that emit GHGs also emit a wide range of other air pollutants (co-pollutants), such as NO_x, SO_2, $PM_{2.5}$, CO, VOCs, and air toxics.
- The environmental benefits from co-pollutant emissions reductions are immediate, tangible, and predominantly local.
- GHG reduction measures can lead to decreases in co-pollutants.
  - For example, a reduction in local fossil fuel combustion will lead to both reduced GHG and co-pollutant emissions.
- GHG reduction measures may lead to unintended increases in co-pollutants.
  - For example, an increase in electricity usage may reduce GHG emissions in total, reduce co-pollutant emissions where the electricity is consumed, but increase co-pollutant emissions where the electricity is generated (e.g., increased EV deployment).

Co-Pollutant Inventory 101

What is an air pollution emissions inventory?

- An emissions inventory describes the sources of emissions for a given air pollutant, or pollutants, and how much of each pollutant is emitted by each source over a defined period within a geographic area.

What is the National Emissions Inventory (NEI)?

- The NEI is a comprehensive and detailed estimate of criteria air pollutants (CAPs) and their precursors, and hazardous air pollutants (HAPs) emissions from sources in the United States. The NEI also contains greenhouse gas (GHG) emissions estimates for some sources.
- The NEI is released every three years, with the 2020 NEI being the most recent version. It can be found here.

How is the NEI developed and used at the EPA?

- The NEI is based upon data provided to the EPA by state, local and tribal air agencies (hereafter referred to as SLTs) across the country.
- In addition, the EPA also generates emissions estimates in-house that are incorporated into the NEI.
- All data is stored in a database managed by the EPA.

How is the NEI developed and used at the EPA?

- The NEI is used by the EPA to identify sources of air emissions, understand emissions trends, aid in the development of rules and policies, and provide input into air quality models.
- While the EPA is a primary user of the NEI, the comprehensive nature of the inventory makes it an important tool for others, including other governmental agencies, the general public, research institutions, and other countries.

Introduction to NEI data: Source Classification Codes (SCC)

- Emissions in the NEI are reported for individual Source Classification Codes (SCCs). There are 5,391 SCCs in the 2020 NEI.
  - SCCs describe the process or function that generates air pollutants. All emissions sources in the NEI have an SCC, and each SCC has 4 levels which describe the process from a general to more specific activity with each successive level.

Less specific → *More specific*

SCC	SCC Level 1	SCC Level 2	SCC Level 3	SCC Level 4
2102001000	Stationary Source Fuel Combustion	Industrial	Anthracite Coal	Total: All Boiler Types
2102002000	Stationary Source Fuel Combustion	Industrial	Bituminous/Subbituminous Coal	Total: All Boiler Types
2102004000	Stationary Source Fuel Combustion	Industrial	Distillate Oil	Total: Boilers and IC Engines
2102004001	Stationary Source Fuel Combustion	Industrial	Distillate Oil	All Boiler Types
2102004002	Stationary Source Fuel Combustion	Industrial	Distillate Oil	All IC Engine Types
2102005000	Stationary Source Fuel Combustion	Industrial	Residual Oil	Total: All Boiler Types
2102006000	Stationary Source Fuel Combustion	Industrial	Natural Gas	Total: Boilers and IC Engines
2102011000	Stationary Source Fuel Combustion	Industrial	Kerosene	Total: All Boiler Types

Introduction to NEI data: sector aggregations

- Sectors are used to summarize different, more detailed (e.g., SCCs) types of activities that generate emissions.
- NEI emissions are also reported as “data categories.” In the 2020 NEI, there are four data categories: onroad, nonroad, point, and nonpoint.
  - Onroad mobile sources include emissions from motorized vehicles that normally operate on public roadways.
  - Nonroad mobile sources include all mobile source emissions that do not operate on roads, excluding commercial marine vessels, locomotives, and aircraft.
  - Point sources include individual facilities, usually at specific latitude/longitude coordinates, and are typically large energy and industrial sites (also includes rail yards and airports).
  - Nonpoint sources include commercial marine vessels, locomotives, and all other stationary sources not included in the point data category (and are reported as county or tribal aggregates). Includes, but is not limited to, some waste disposal sources, all agricultural sources, and most industrial, commercial, institutional, and residential fuel burning.

Introduction to NEI data: spatial aggregations

- All onroad, nonroad, and nonpoint SCCs are reported at the county-level.
- All point SCCs are reported for individual units and processes within a facility. EPA can also provide point source NEI data summed by facility.
- All emissions in the NEI are annual totals, but temporal specificity is also necessary and available through EPA's modeling platforms.

Introduction to NEI data: GHGs in the NEI

- Point source GHGs in the NEI include:
  - Facility totals from the GHGRP (CO_2, CH_4, N_2O, SF_6) and GHGs from SLT submissions.
  - CO_2 from airports and CO_2, CH_4, and N_2O from railyards.
- Mobile source GHGs by county/process:
  - Onroad and nonroad from MOVES (CO_2, CH_4; Onroad includes N_2O).
  - Locomotives (CO_2, CH_4, N_2O) and Commercial Marine Vessels (CO_2).
- Wildfires and prescribed burning by county (CO_2, CH_4).
- The NEI does not have GHG emissions for most nonpoint sources (e.g., oil and gas extraction and production; industrial, commercial, and residential fossil combustion). These emissions are available from EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks by State* (GHGI)
- Note: The GHGI is the U.S. EPA's official GHG inventory and is different from the NEI.

Online 2020 NEI Data Retrieval Tool

- To help CPRG applicants access data from the 2020 NEI, OAQPS has developed the 2020 NEI Data Retrieval Tool.
- Using this tool, users can select, view, and download data from the 2020 NEI at the SCC- and county-level for onroad, nonroad, and nonpoint sources, and at the facility-level for point sources.
  - In the tool, all onroad, nonroad, and nonpoint emissions are available in the "County Level Data" table, and point emissions are available in the "Facility Data" table.

URL: https://awsedap.epa.gov/public/single/?appid=20230c40-026d-494e-903f-3f112761a208&sheet=5d3fdda7-14bc-4284-a9bb-cfd856b9348d&opt=ctxmenu,currsel

Examples of Co-Pollutant Benefits Analyses

Disclaimer: *The examples provided here are intended for illustrative purposes and should not be viewed as preferential GHG reduction measures.*

Methods for quantifying co-pollutant benefits

- Several tools that can be used to estimate GHG reductions can simultaneously quantify co-pollutant benefits.
  - EPA's AVoided Emissions and geneRation Tool (AVERT)
  - EPA's GLIMPSE modeling tool
  - EPA's MOtor Vehicle Emission Simulator (MOVES)
- Applicants can meet the co-pollutant benefits requirements, when applicable, by reporting the co-pollutant emissions changes output derived from the GHG reduction measure tool.

URL for tools: https://www.epa.gov/inflation-reduction-act/quantifying-energy-savings-and-greenhouse-gas-ghg-reductions

Methods for quantifying co-pollutant benefits

- If a GHG reduction measures tool does not provide co-pollutant information, applicants can meet the co-pollutant benefits requirements, when applicable, by submitting:
  - The underlying *activity change* of an emissions source (e.g., vehicle miles traveled for affected vehicle types).
  - Changes to electricity demand for an area if the GHG reduction measure(s) involves energy efficiency or energy demand changes.
- Alternatively, the applicant can:
  - Estimate co-pollutant changes by proportionally applying changes in GHG emissions to co-pollutant emissions from a base year inventory (if the GHG reduction measure(s) captures GHGs and other pollutants).
  - Submit zero changes in co-pollutant emissions if the GHG reduction measure(s) is not expected to have an impact on co-pollutants.

Example 1: Rooftop Solar

- Awardee proposes to install 10 MW of rooftop solar capacity in jurisdiction. This would go on ~2,500 households.
- Awardee partially analyzes policy impacts on emissions using AVERT[1].
  - AVERT estimates county-level emission changes for NOx, SO2, CO2, primary PM2.5, VOC, and NH3 from the electricity demand changes.
- Awardee uses 2020 NEI as a baseline year inventory for co-pollutants.

Annual emissions changes from AVERT

Pollutant	Total Emission Changes (lb) From Fossil Generation
SO_2	-7,890
NO_x	-11,030
CO_2	-24,262,160
$PM_{2.5}$	-1,640
VOCs	-700
NH_3	-660

1. AVoided Emissions and geneRation Tool (AVERT)

Example 1: Rooftop Solar

- Use 2020 NEI Data Retrieval Tool to collect baseline year emissions:

Overview | County Level Data | Facility Data

2020 Facility Source Emissions Table

SITE NAME	EIS Fa...	STATE	State-County	Pollutant	Pollut...	Emissions (Ton...	Facility Type	Street Address
Duke Energy Carolinas, ...	8370411	North Carolina	NC - Catawba	Nitrogen Oxides	CAP	5,991.98000	Electricity Generati...	8320 East NC Hwy ...
Duke Energy Carolinas, ...	8514011	North Carolina	NC - Stokes	Nitrogen Oxides	CAP	4,497.30000	Electricity Generati...	3195 Pine Hall Road
Duke Energy Progress, ...	7826011	North Carolina	NC - Person	Nitrogen Oxides	CAP	3,601.12000	Electricity Generati...	1700 Dunnaway Ro...
CPI USA North Carolina...	8176711	North Carolina	NC - Brunswick	Sulfur Dioxide	CAP	3,157.90000	Electricity Generati...	1281 Power House ...
Duke Energy Carolinas, ...	8370411	North Carolina	NC - Catawba	Sulfur Dioxide	CAP	3,086.51000	Electricity Generati...	8320 East NC Hwy ...
Duke Energy Progress, ...	7826011	North Carolina	NC - Person	Sulfur Dioxide	CAP	2,637.52000	Electricity Generati...	1700 Dunnaway Ro...
Duke Energy Carolinas, ...	8300611	North Carolina	NC - Rutherford	Nitrogen Oxides	CAP	2,074.49000	Electricity Generati...	573 Duke Power Ro...
Duke Energy Carolinas, ...	8370411	North Carolina	NC - Catawba	Carbon Monoxide	CAP	2,045.99000	Electricity Generati...	8320 East NC Hwy ...
CPI USA North Carolina...	7826311	North Carolina	NC - Person	Sulfur Dioxide	CAP	2,005.00000	Electricity Generati...	331 Allie Clay Road
Duke Energy Carolinas, ...	8514011	North Carolina	NC - Stokes	Sulfur Dioxide	CAP	1,873.93000	Electricity Generati...	3195 Pine Hall Road
CPI USA North Carolina...	8176711	North Carolina	NC - Brunswick	Carbon Monoxide	CAP	1,188.34000	Electricity Generati...	1281 Power House ...

Example 1: Rooftop Solar

Framework:

1. Select Policy: Awardee proposes to install 10 MW of rooftop solar capacity in jurisdiction.
2. NEI: Obtain co-pollutant emissions at the county-level for the baseline year inventory.
3. AVERT: Use AVERT to model impacts of policy on county-level emissions of NO_x, SO_2, CO_2, primary $PM_{2.5}$, VOC, and NH_3.
4. Co-Pollutant Projections: Obtain future year co-pollutant emissions from the EPA ("business-as-usual" projection). Apply changes predicted by AVERT to future inventory.
   - For co-pollutants not predicted by AVERT (e.g., HAPs), scale HAP emissions from the baseline year inventory using proportional changes of other (e.g., VOC, $PM_{2.5}$) emissions that are predicted by AVERT.

Example 2: Commercial Building Energy Efficiency

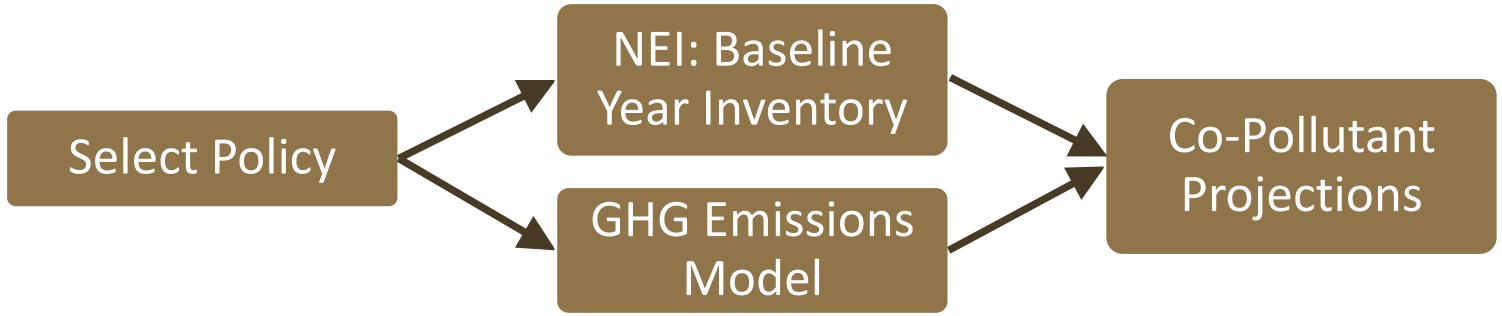
- Awardee proposes to retrofit commercial buildings to enhance energy efficiency. It is estimated that there will be a reduction of 40 GWh of electricity demand locally as a result.
- Awardee analyzes policy impacts on emissions using a proprietary, contractor developed tool.
  - Tool estimates emission changes for GHGs but not co-pollutants.
- Awardee can submit change in electricity demand for jurisdiction to meet requirements. Awardee decides to use 2020 NEI to generate baseline year and future projections of co-pollutants.

Annual, Regional Emissions Changes

Pollutant	Total Emission Changes (lb)
	From Fossil Generation
CO_2	-62,175,990
CH_4	-4,010
N_2O	-30

Example 2: Commercial Building Energy Efficiency

Framework:



1. Select Policy: Awardee proposes to retrofit commercial buildings to enhance energy efficiency. A proprietary model estimates that there will be a reduction of 40 GWh of electricity demand locally as a result.
2. NEI: GHG reduction measure will reduce emissions from local power station. Awardee obtains co-pollutant emissions from this facility.
3. Co-Pollutant reductions: Since co-pollutants are not predicted by base model, awardee scales all co-pollutants in the baseline year inventory using proportional changes in CO_2 emissions predicted by base model.
4. Co-Pollutant Projections: Obtain future year co-pollutant emissions from the EPA ("business-as-usual" projection) for sources in baseline year inventory. Apply changes predicted by prior step to future inventory.

Resources

- CPRG Tools and Technical Assistance - Benefits Analysis website
- 2020 NEI website
- EPA's AirKnowledge Emissions Inventories curriculum

Upcoming Trainings

- **July 27, 1-2 PM ET**: Quality Assurance Project Plans (QAPPs)
- **Aug 2, 1-3:30 PM ET:** EPA Programs, Tools, and Resources used for Evaluation and Quantification of GHG Reduction Measures
- **Week of Aug 7**: EPA Climate Action Funding Fair with USDA, DOE, HUD, DOI, DOT, and Treasury on IRA and other funding opportunities (five sessions on each of the key CPRG sectors and one session on tribal programs, each 90-120 minutes)
- **Aug 9, 2-3 PM ET**: Quantified GHG Reduction Measures
- **Aug 16, 2-3 PM ET:** Low Income/Disadvantaged Communities (LIDAC) Benefits Analysis
- **Aug 23, 2-3 PM ET:** Workforce Planning Analysis
- **Aug 30, 2-3 PM ET:** Meaningful Engagement - Update and Technical Resources

CPRG Technical Assistance Forums (TAFs)

- Opportunity for peer-to-peer technical assistance, collaboration, and mentoring.
- Sharing of case studies, best practices, and lessons learned
- Forums will focus on key plan elements (e.g., emission inventories, best practices for collaboration, key sectors for GHG reductions, benefits to low income and disadvantaged communities, etc.)
- Facilitated and led by EPA subject matter experts and contractors
- Will be launched late summer/early fall via Microsoft Teams platform