Power Plants and Neighboring Communities
Highlighting the communities around power plants

July 29, 2021
11:00 AM ET

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Other Logistics for Today’s Webinar

• Attendees will be muted during presentation

• Questions:
  • We will take questions related to the Power Plants and Neighboring Communities resource at the end of this webinar.
  • Please type your questions using the Q&A function (please include your name and affiliation)
  • After the webinar: email press@epa.gov
Agenda

• Welcome Remarks
  - Joe Goffman, Acting Assistant Administrator for the Office of Air and Radiation, EPA

• Introduction to EPA’s Power Plants and Neighboring Communities Project
  - Reid Harvey, Director, Clean Air Markets Division, EPA

• Highlights from the Power Plants and Neighboring Communities Resource
  - Travis Johnson, Clean Air Markets Division, EPA
Welcome Remarks
Joseph Goffman
Acting Assistant Administrator
Office of Air and Radiation
Introduction

EPA’s Power Plants and Neighboring Communities Resource

Reid Harvey

Director, Clean Air Markets Division

Office of Air and Radiation
Outline

• Covered power plants
• Key demographics
• Methodology
• Demonstration of the Power Plants and Neighboring Communities Mapping Tool
• Summary graphs
• Additional information
• Q&A
Power Plants and Neighboring Communities

Two Key Publicly Available Data Sets

**Power Plant Data**
1. Plant characteristics
2. Operating information
3. Fuel use
4. Emissions and emission rates

**Neighboring Community Demographics**
1. Low-Income Population
2. People of Color
3. Population with Less Than High School Education
4. Linguistically Isolated Population
5. Population Under Age 5
6. Population Over Age 64
7. Demographic Index (average of Low-Income and People of Color)
Included Power Plants

- Over 3,400 combustion power plants
- Grid-connected and at a facility over 1 MW
• EPA obtains the demographic information from the U.S. Census Bureau’s American Community Survey (ACS) 2014-2018 5-year summary file, which is based on 2018 Census boundaries.

• Key demographics and population metrics are determined for the areas within three miles of each plant using EJSCREEN data and methodology.

• **EJSCREEN** is EPA’s environmental justice mapping and screening tool that provides a nationally consistent dataset and approach for combining environmental and demographic indicators.
Let’s look at an example to show the methodology for determining the key demographics of the neighboring communities.
Block Groups

- Smallest geographical unit for which the bureau publishes sample data.
- Population of 600 to 3,000 people.
- Over 200,000 block groups.
- Range in size from a few hundred square miles to a few city blocks.
Average demographics for buffer

Summary Demographics Methodology
- Determine which Block Groups are fully in or partially in the 3-mile buffer.
- For Block Groups partially in the buffer, estimate how much of each block group’s population is inside the buffer.
- Values are based on population-weighted Block Group demographics.
- Designed to represent the average resident within the buffer.
- Provides an estimate of the total population residing in the buffer.
Community Demographics with Percentiles

- **People of Color (39%)**: 72nd percentile
  - 59%

- **Low-income (33%)**: 83rd percentile
  - 54%

- **Linguistically Isolated (4%)**: 68th percentile
  - 4%

- **Less Than High School (13%)**: 71st percentile
  - 16%

- **Under Age 5 (6%)**: 69th percentile
  - 8%

- **Over Age 64 (15%)**: 46th percentile
  - 13%

Percentage of Key Demographic in 3-mile radius (with national average)
Percentages or Percentiles?

• Percentiles are a way to see how residents in a specific area compare to everyone else in the United States.
• The national percentile tells you what percent of the U.S. population has an equal or lower value.
• For example, an area that is at the 83rd national percentile for low-income has a higher low-income population percentage than where 83% of the U.S. population lives.

A percentage is an absolute term. If you received 80% on a test of one hundred questions you had 80 correct answers.

A percentile is a relative term, and tells you how you have done on the test in comparison to the others who took the test. A percentile of 80 means that you scored equal to or better than 80% of people who took the test.
Mapping Tool – Demographic Index

Power Plants and Neighboring Communities Mapping Tool

Filters
- All
- Biomass
- Coal
- Gas
- Oil
- Other Fossil

Legend
- Fossil Fuel Power Plants
- Demographic Index (National Percentile)
  - 95 - 100
  - 90 - 94
  - 80 - 89
  - 70 - 79
  - 60 - 69
  - 50 - 59
  - 0 - 49

Number of Power Plants: 3,477
Layers

Power Plants and Neighboring Communities Mapping Tool

Filters

Fuel Type
- All
- Biomass
- Coal
- Gas
- Oil
- Other Fossil

Demographic Index
- 0+

Low-Income
- 0+

People of Color
- 0+

Less than High School Education
- 0+

Linguistically Isolated
- 0+

Legend

Plant unadjusted annual NOx emissions (tons)

Emissions:
- CO2
- NOx
- SO2
- PM2.5

Fossil Fuel Power Plants
3-mile Buffer

Number of Power Plants
3,477

Annual 2019 emissions for NOx, CO2, SO2, and PM2.5
Tribal Areas

Power Plants and Neighboring Communities Mapping Tool

Filters

Fuel Type
- All
- Biomass
- Coal
- Gas
- Oil
- Other Fossil

Demographic Index
- 0+

Low-Income
- 0+

People of Color
- 0+

Less than High School Education
- 0+

Linguistically Isolated
- 0+

Legend

Tribal Areas

Tribal Areas: Lower 48 States

Number of Power Plants

3,477
Users can filter the map to display plants based on:

- Fuel type
- National percentile of the key demographics (low-income, people of color, less than high school education, linguistically isolated, under age 5, and over age 64)
- Plant nameplate capacity (MW)
- Plant utilization (% of generating capacity)
- Emissions ($SO_2$, $NO_X$, $CO_2$, and $PM_{2.5}$) (tons)

The number of plants meeting the user-selected criteria is displayed.
Filter Example - Coal-fired plants in areas with a low-income national percentile at or above 80
Going back to the Omaha, Nebraska example
Power Plants and Neighboring Communities

Layers – Census Block Population

Filters
- Fuel Type: All, Biomass, Coal, Gas, Oil, Other Fossil
- Demographic Index: 75+, Low-Income: 80+, People of Color: 70+, Less than High School Education: 0+, Linguistically Isolated: 0+, Population Less than 5: 0+

Legend
- Demographics (Census Block Group)
  - Census Block Group Boundaries
  - Census Block Group Population
    - 1 Dot = 6
    - ACSTOTPOP

Number of Power Plants: 3
Power Plants and Neighboring Communities

Layers – Demographic Index

Power Plants and Neighboring Communities Mapping Tool

Filters

- Fuel Type:
  - All
  - Biomass
  - Coal
  - Gas
  - Oil
  - Other Fossil

- Demographic Index:
  - 75+
  - 80+

- Low-Income
  - 70+

- People of Color
  - 60+

- Less than High School Education
  - 50+

- Linguistically Isolated
  - 40+

- Population Less than 5
  - 30+

Legend

Demographic Index National Percentile
- > 95 - 100%
- > 90 - 95%
- > 80 - 90%
- > 70 - 80%
- > 60 - 70%
- > 50 - 60%
- 0 - 50%
- No Data

Number of Power Plants
- 3
Power Plants and Neighboring Communities

Detailed Information – Plant Level

Plant: North Omaha Station (NE)

<table>
<thead>
<tr>
<th>Plant ID</th>
<th>2291</th>
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</thead>
<tbody>
<tr>
<td>Data Year</td>
<td>2019</td>
</tr>
<tr>
<td>Plant nameplate capacity (MW)</td>
<td>645</td>
</tr>
<tr>
<td>Plant Utilization (a.k.a, capacity factor)</td>
<td>33.17%</td>
</tr>
<tr>
<td>Fuels</td>
<td>Primary fuel: Coal, Primary combustion fuel: Coal</td>
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<tr>
<td>Total population within 3 miles (ACS2018)</td>
<td>38,348</td>
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<tr>
<td>Demographic Index</td>
<td>57% (79%ile)</td>
</tr>
<tr>
<td>Low-Income</td>
<td>54% (83%ile)</td>
</tr>
<tr>
<td>People of Color</td>
<td>59% (72%ile)</td>
</tr>
<tr>
<td>Less than High School Education</td>
<td>16% (71%ile)</td>
</tr>
<tr>
<td>Linguistically Isolated</td>
<td>0% (68%ile)</td>
</tr>
<tr>
<td>Population under Age 65</td>
<td>8% (69%ile)</td>
</tr>
<tr>
<td>Population over Age 64</td>
<td>13% (46%ile)</td>
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2019 Emissions (tons)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>2,331,027 CO2</td>
<td></td>
</tr>
<tr>
<td>3,343,1 NOx</td>
<td></td>
</tr>
<tr>
<td>5,792.8 SO2</td>
<td></td>
</tr>
<tr>
<td>79.3 PM2.5</td>
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2019 Emission rates (lb/MWh)

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>2,489 CO2</td>
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<tr>
<td>3.6 NOx</td>
<td></td>
</tr>
<tr>
<td>6.2 SO2</td>
<td></td>
</tr>
<tr>
<td>0.1 PM2.5</td>
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</table>

2020 Emissions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Total generation: 1,873,296</td>
<td></td>
</tr>
<tr>
<td>Generation from combustion: 1,873,296</td>
<td></td>
</tr>
</tbody>
</table>

Plant data, key demographic data, emissions, emissions rates, and generation.
Power Plants and Neighboring Communities

Links to Power Plant Data

**eGRID**

- Annual data compiled from the EPA and the Energy Information Administration (EIA) and primarily used to determine emissions associated with electricity consumption.
- Unit- and plant-level data on facility attributes, emissions and emission rates, operation, fuel use, ownership, and service areas.
- The 2019 annual data is available.

**CAMD Power Sector Data**

- Emission data supports compliance assessment with emission reduction programs and policy development.
- Unit-level hourly emissions and operating data from larger plants (at least 25 MW).
- The 2020 annual data is available.
Power Plants and Neighboring Communities

Link to EJSCREEN Report

Report includes information on EJ Indexes (shown above), environmental indicators, and demographic indicators.
Heart Attacks†

The environment is one of several factors that can lead to an increased risk for heart disease. High levels of air pollution and extreme hot and cold temperatures have been linked to increases in heart disease and deaths from heart attacks. A heart attack happens when a part of the heart muscle dies or gets damaged because of reduced blood supply.

In 2019, there were

• 75 deaths from heart attacks in Douglas County.
• 595 deaths from heart attacks in Nebraska.

Report includes information on county or state demographics, asthma, ground-level ozone and particulate matter, smoking, extreme heat, heart attacks (shown above), access to parks, and proximity to highways.
Power Plants and Neighboring Communities

Link to ECHO – Enforcement and Compliance Report

Detailed Facility Report

Report includes information on plant-level characteristics, enforcement, compliance, environmental conditions, pollutants, and community.
The mapping tool is linked from a webpage which provides context, additional information about the data sources, and interactive summary graphs.
• Closing large fossil fuel-fired power plants may have immediate and lasting effects on the surrounding communities.
• The color of the marker indicates fuel type (coal is red and natural gas is blue).
• The color saturation level indicates projected retirement year with earlier years lighter in shade.
• The marker size represents projected retirement capacity.
Questions about how to use this tool?

• Please enter your question in the Q&A box

• If your question is not answered or for additional questions and comments email: press@epa.gov

• Webinar will be posted on the website: https://www.epa.gov/airmarkets/power-plants-and-neighboring-communities