

# How to Submit Effective Comments on NEEDS and IPM

## Summary

This document is intended to provide guidance on submitting clear, concise, and impactful comments on NEEDS (National Electric Energy Data System), other inputs to the Integrated Planning Model (IPM), or outputs from IPM.

While the EPA always welcomes comments on its data, be sure to submit comments to the appropriate docket by the due date if the comment is regarding modeling in support of a NODA or rulemaking.

When submitting a comment, please remember these following principles:

- 1) **Be as specific as possible** regarding what unit, plant, state, regulation, or law you are referring to. This helps ensure the EPA understands to what you are referring.
  - a. For comments on specific units, provide the plant name and NEEDS Unique ID
  - b. For comments on specific plants, provide the plant name and ORIS code
  - c. For laws and regulations, refer to them by name (not just “laws in [state name]”).  
Provide citations if possible.
- 2) **Identify if you are referring to a model INPUT or an OUTPUT.** When commenting on model outputs, it is helpful to connect your comments, if possible, about the model’s behavior to inputs and constraints, as inputs and constraints are what EPA can change in the model.
- 3) **Identify the specific data parameter of concern, including the current model input/output value, and the value you believe it should be.** This again helps ensure the EPA understands what you want changed.
- 4) **Provide strong documentation with clear citations and web links.** Strong documentation includes: operating permits; documentation of firm financial commitments; evidence (photographs, news articles, press releases) that construction on a new unit or retrofit has started or that a plant has been retired; copies of state rule, consent decrees, NSR settlements; designation as a reliability must run (RMR) unit. Weak documentation includes: utility integrated resource plans (IRPs) or announcements that reflect current intentions but not firm commitments; and references to historic data/operation *without* a clearly supported reason why that historic behavior *must* continue in the future.
- 5) **Remember that there is a time-lag between when you submit a comment and when it is reflected in EPA’s modeling.** Modelling that is released within a few months after your comment is submitted may not yet reflect any changes related to your comment, due to the lead time required for conducting such modeling.
- 6) **Remember that some comments may not be “ripe” to support changing model inputs.** For example, a utility might announce its intention to retire a unit in five years, but may not yet have the necessary approvals. In these cases, EPA welcomes comments about these units and will monitor the situation and update the model inputs when the retirement is firmer.
- 7) **Check the status of prior comments.** EPA will be releasing quarterly a list of the comments it has received, including their review status and any resulting changes.

Finally, while EPA accepts comments in any format, it is recommended that you use the comment spreadsheet we’ve developed. This will help ensure your comments are as clear as possible and remind you to follow the above principles that facilitate our ability to factor your input into our work going forward.

## Introduction

Commenters play an essential role in our modeling development, providing interpretations of the raw data and ensuring that the most appropriate data is being used by the Agency. This guidance document is focused on comments about the EGU sector, and is oriented toward commenters that may be focused on the behavior of a single unit or a small set of units. This guidance describes information about units (that may be analyzed directly and/or used as input to models) as well as estimates about potential emissions from units based on modeling projections and other analytic approaches.

This document is intended to help commenters provide complete information about unit configuration and behavior that can be understood by EPA.

This document is organized as follows:

- What data sources are used as inputs to EPA's modeling with IPM?
- What is contained in the NEEDS database?
- What are the data outputs of IPM?
- What information should I include in my comment?

## What data sources are used as inputs to EPA's modeling with IPM?

EPA uses several major sources of data to provide inputs to the Integrated Planning Model (IPM). The inputs include information describing the configuration of each unit in the existing EGU fleet, such as the size of the unit, type of boiler, and types of fuel it is capable of utilizing. These are distinct from the outputs, which are modeled projections of how the units could operate in the future including dispatch, retrofit, retirement, fuel type selected for future-year operation, and construction of new capacity.

It is important to identify if the data that concerns you is an input or an output so that you can comment effectively. Inputs to IPM are determined by EPA and are based on real, reported data. This data is constantly changing and, provided with sufficient documentation, the EPA can directly modify the inputs to the model. Outputs from IPM are based upon solving mathematical equations that use input data. Comments on outputs (e.g. "This result doesn't match my expectation or other projections") tends to be less actionable, because directly modifying the outputs would prompt a more complicated consideration of whether/how such modifications necessitate revisiting other components of the modeled systemwide solution. It is our preferred approach to adjust model inputs, assumptions, and/or constraints to produce new outputs that still represent a least-cost (economic) projection; hence our recommendation that commenters who are concerned with a model output identify justified changes to relevant input data, assumptions, or constraints likely to drive the output of concern. In any circumstance, comments on the model outputs can be useful if they flag an unexpected result. Comments on outputs are most effective, though, when they relate back to the inputs to the model.

Below is a list of the major sources of data the EPA uses to form the inputs to IPM. You can also see the documentation for IPM for more detailed information about the data inputs and how they are used.

### **Data inputs:**

**EPA Air Markets Program Data (AMPD).** Continuous emissions monitoring and reporting of sulfur dioxide (SO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), and nitrogen oxide (NO<sub>x</sub>) follow the monitoring regulations in Part 75 of Volume 40 of the Code of Federal Regulations (CFR) for sources included in several programs administered by EPA. Data for individual units and for groups of units can be found in the Air Markets Program Database available at <https://ampd.epa.gov/ampd/>

**NEEDS.** The National Electric Energy Data System (NEEDS) is the database of existing and planned-committed units. This includes unit-level information about units that are currently operational and new units that are firmly anticipated to be operational in the future, and have either broken ground (initiated construction) or secured financing (these units are termed "planned-committed"). The NEEDS database is an input for IPM. See the [NEEDS User's Guide](#) for additional information.

**Coal availability.** For units that operate with this fuel, the specific attributes of the fuel are instrumental in the operation and emissions of the unit. Coal supply, coal quality, the availability of specific types of coals to individual coal fired generating units, the cost of the coals, the coal transportation network, and the transportation cost are key components of the endogenous coal market modeling framework within IPM. Details can be found in [chapter 7 "Coal" of the IPM documentation](#). For purposes of this document, we will direct the reader to specific pieces of this extensive documentation.

For units burning coal, we also suggest first reviewing the coal transportation matrix. Table 7-20 in the IPM documentation provides a crosswalk between plant ORIS code and the coal supply region (presented both as a code and with the full description). We suggest assessing whether these coal

supply regions are reasonable sources for your unit. That is, if you are purchasing coal from a region that is not listed, please provide that information to EPA with any information about coal quality, production and transportation costs that you would like to provide. Alternatively, assess whether source regions cannot be accessed because of physical transportation limits. Because the cost of delivery is an important part of the overall cost, assessment of the cost of transportation is important.

Next, we suggest reviewing the coal supply curves. Table 7-6 in the IPM documentation shows the various coal supply regions and the types/grades of coals that are available in each region. More-detailed cost curves found in table 7-21 provides information on the cost to extract, the coal quality including sulfur and heat content, and reserves for mines (i.e., availability) in each coal supply region.

**Gas supply matrix and costs** IPM Platform 6 uses natural gas supply curves rather than endogenously modeling the entire US and Canada natural gas system. These curves are derived through a least cost linear program model solving for the least cost provision of gas to meet total demand. They can be viewed in Chapter 8 of the IPM platform 6 documentation. These curves provide a cost per production level for a specific model run year, and are different for each model run year in IPM's time horizon. These curves were developed using the Gas Market Module (GMM), as described in chapter 8 of the documentation and they reflect a Henry Hub Spot Price and total gas available to the power sector. The curves are accompanied by a table of basis differentials which have region specific cost adders reflecting the transportation costs.

Commenters are welcome to provide comments on the natural gas supply curves and differentials (including the value and slopes of the curves for any of the years, or how those slopes change among the years), the cost adders, or underlying GMM analysis.

## What data is contained in the NEEDS Database?

One of the primary input data sources is EPA's NEEDS database, which can be viewed as an Excel workbook. NEEDS contains a unit-level description of the EGU fleet that is used by IPM. So, this is an important data set to verify, and a first source to examine if "output" modeling estimates are not as expected.

NEEDS contains data on unit characteristics, including:

- Attributes like the name and location of the unit;
- Physical parameters of each unit including unit capacity, heat rate, type of boiler
- Unit online year and retirement year (if it has a firm retirement date)
- Emissions control information, including type of controls and when they were retrofit (or will be retrofit if firmly known).
- If the unit has been or is firmly scheduled to convert from coal to gas and the year of the conversion.
- NO<sub>x</sub> Emissions Rates, reflecting possible combustion control upgrades and operation of post-combustion controls at units.
  - For NEEDS version 6 variations, NO<sub>x</sub> rates are based on 2017 historical values.
  - NO<sub>x</sub> rates are calculated off historical data and reflect the fuel mix for that year and burn at the unit. NEEDS represents up to four scenario NO<sub>x</sub> rates based on historical

data to capture seasonal and existing control variability. These rates are constant and do not change independent of fuel mix assumed in the model. If the unit undertakes a post-combustion control retrofit or a coal-to-gas retrofit, then these rates would change in the model projections.

- NEEDS has prospective NO<sub>x</sub> rates for units that can upgrade to state of the art combustion controls and if post-combustion controls are or are not operating (if the unit has operated the controls seasonally in the recent past).
- The model recalculates the NO<sub>x</sub> rates if the unit is projected to add a new post-combustion control.
- SO<sub>2</sub> Permit Rates. This is the permitted emission level, NOT the emissions rate that the unit will necessarily operate at in the model. The operational SO<sub>2</sub> emissions rate is an output of IPM, not an input, since the modeled SO<sub>2</sub> rate is highly dependent on fuel choice. Model-projected SO<sub>2</sub> emission rates for a given unit may not exceed the applicable permit rate shown in NEEDS for that unit and are often significantly lower than the permit rate.

See the [NEEDS User Guide](#) for a list and description of the data fields in NEEDS.

A description of how the values for these various characteristics are determined can be found in the [IPM Documentation, Chapter 4](#).

## What are the Data Outputs of IPM?

Unexpected unit behavior, state level results, or national results are sometimes the first clue that input data may need to be updated. EPA has a document called the [“Guide to IPM Output Files”](#) that describes useful output files including:

- [System Summary Report \(SSR\) File](#): It contains system-wide power sector results for the lower continental U.S. for each run year. It reports forecasted generation, capacity, capacity additions, capacity factors, production costs, emissions, fuel consumption & cost, and allowance prices by model run year. Disaggregation of system-wide data to plant type data is provided for generation and capacity fields. The plant types are categorized based on fuel used (e.g., coal, oil/gas, nuclear, hydro), combustion technology (e.g., turbine, combined cycle gas), control technology (e.g., scrubber, post-combustion NO<sub>x</sub> control), and retrofit structure (e.g., coal plant with existing SNCR retrofit with ACI). In addition to providing the above outputs forecasted for each model run year, it also gives information on the various regulatory and legal requirements that were inputted into the model as constraints.
- [State Level Emissions File](#): This file shows EGU emissions at the state level for each run year. There are two tabs, one showing emissions from all EGUs, and the other showing emissions only from fossil units greater than 25 MW.
- [RPE File](#): For each model plant, this file shows the projections of fuel consumption, emissions, capacity, costs (capital, fixed operations and maintenance, and variable operations and maintenance), and generation

Sometimes, but not always, EPA will parse the model results from a specific year from the model plants back to “real-world” units (i.e. create parsed file). This parsing is a post-processing step for the IPM

results and is only done to meet specific analytical requirements; *it is not a standard model output*. While the parsed files are post-processed, and therefore not a direct output of IPM, they are often helpful in understanding the choices the model made and why it made them. The parsed file includes information about how the model chose to dispatch, retrofit, retire, and build EGUs, as mapped to real-world units. It includes information on unit heat input, fuel choice, generation, emissions, and retrofit/retirement actions.

## What information should I include in my comment?

You likely have a lot of information about the unit you are commenting about. EPA is looking at thousands of units and has access to some information (i.e., through continuous emissions monitoring system (CEMS) measurements), but may not have the full spectrum of information that you can provide. Thank you, in advance, for providing this information.

For comments to be effective, the comment needs to be complete, and it needs to be supported by documentation to the extent possible. Comments like “my unit is a “must-run” unit and is not going to be retired” need to be supported. For example, describe the particular transmission constraint that is resulting in the load pocket that the unit is supplying. What documents are available from the facility operator, local, state, or federal officials to support the claim? Please provide EPA with a copy of that document, or a link to where the document can be found.

**Strong Documentation:** Documentation and evidence can support a strong case to change or update NEEDS when it demonstrates that: a unit must operate within specific parameters; a unit is clearly being retrofit, retired or built; or that the unit has a choice of options to comply with new state rules consent decrees, or settlements. It includes, but is not limited to:

- Unit operating permits
- Documentation of firm financial commitments for financing a new unit or retrofit
- Evidence that ground has been broken on a new unit or retrofit (photographs, news articles, press releases)
- State Rules, Consent Decrees, NSR Settlements, etc.
- Designation as a reliability must run (RMR) unit.

It is extremely helpful to provide a copy or link to the actual documents cited, including a reference for the page number. This will ensure that we can easily find the information your comment is based on.

**Other Documentation:** Documentation and evidence that does not demonstrate a firm retrofit, retirement, or construction of a unit nor shows that a unit must operate in a certain manner can be helpful, but is generally considered to offer weaker support for making a change to NEEDS and/or IPM assumptions or constraints and, on its own, may not provide enough certainty to support changing such data.

For example, long-term utility integrated resource plans (IRP) are not firm commitments to build, retire, or retrofit units and can and do change from year to year. Similarly, a unit’s emissions rate can vary year to year. While it is helpful to identify instances where there is a large variation in rates between historical data and the corresponding rates in NEEDS, especially in conjunction with identifying reasons

for the change (e.g., this unit just retrofit an SCR), small variations tend to reflect the choice of base year for the data, and EPA typically prefers to use a consistent set of base year data for such input assumptions rather than vary that base year on a unit-by-unit basis. Documentation of this category includes:

- Utility IRPs.
- Historical data on past unit behavior without justification for why that behavior will remain the same in the future.
- Press releases about possible, but not firm, fleet changes.
- Proposed state rules.

Even if the data provided fits in one of these categories, it can still be helpful to submit. Even if EPA determines the documentation itself does not support an immediate change, it can flag to EPA to watch for changes at units or in state rules.