EPA's Power Sector Modeling Platform 2023 using IPM Documentation Supplement Supporting RIA Analysis of Final MATS RTR

1. Overview

This supplement includes details on the modeling assumptions applied in EPA's analysis of the MATS RTR. The baseline for this analysis is EPA's Power Sector Modeling Platform 2023 using IPM.[1] In addition to the baseline, EPA analyzed the final rule scenario. This scenario reflects mercury and filterable PM emissions limits that are lower than the allowable limits in the baseline. The sections below describe the modeling approach utilized to reflect the mercury and filterable PM limits in the final rule scenario.

2. Mercury Standard

For the final rule, EPA modeled a mercury limit of 1.2 lbs/TBtu for all lignite-fired EGUs. This limit is modeled endogenously and reflects the assumption that each of the lignite-fired EGUs replace standard powdered activated carbon (PAC) sorbent with halogenated premium PAC sorbent. The incremental variable cost of each applicable EGU is estimated based on information supplied by Sargent & Lundy,[2] and the modeled emissions are reduced to reflect compliance with an emissions rate of 1.2 lbs/TBtu.

3. Filterable PM Standards (Surrogate Standard for Non-Hg HAP metals)

For the filterable PM standard, PM emissions controls and associated costs are modeled based on information available in the memorandum titled: "2024 Update to the 2023 Proposed Technology Review for the Coal- and Oil-Fired EGU Source Category (2024 Technical Memo)" which is available in the docket. This memorandum summarizes the current filterable PM emissions rate for each existing EGU. For the final rule, the EPA analyzed a filterable PM emission standard for existing coal-fired EGUs of 0.010 lb/MMBtu. Based on the difference between the emissions rates detailed in the 2024 Technical Memo and the fPM emission standard of 0.010 lb/MMBtu, the EPA assumed various levels of ESP upgrades, upgrades to existing fabric filters, or new fabric filter installations in the modeling. These assumptions are implemented in the model through the assignment of endogenous retrofit options.

Table 1 summarizes the cost and filterable PM emissions reduction associated with each control in the modeling. Table 2 presents the PM control improvements assumed for each unit in the modeling of the final rule.

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[1] Detailed information and documentation of EPA's Baseline run using EPA's Power Sector Modeling Platform 2023 using IPM, including all the underlying assumptions, data sources, and architecture parameters can be found on EPA's website at: *https://www.epa.gov/power-sector-modeling*

[2] Mercury Control Incremental Operating Cost Methodology, Sargent & Lundy (2023)

Table 1. Cost and Performance Assumptions for Filterable PM Control Improvements

PM Control Strategy	Capital Cost	Filterable PM_{10} Reduction	Filterable $PM_{2.5}$ Reduction
Operation & Maintenance (O&M)	$100,000/yr	Unit-specific	Unit-specific
Minor ESP Upgrades	$20/kW	20%	13.3%
Typical ESP Upgrades	$40/kW	40%	26.7%
ESP Rebuild	$80/kW	55% (0.005lb/MMBtu floor)	36.7% (0.005lb/MMBtu floor)
Upgrade Existing FF Bags	Unit-specific, approximately $15K - $500K annual O&M	50% (0.002 lb/MMBtu floor)	33.3% (0.002 lb/MMBtu floor)
New Fabric Filter (6.0 A/C Ratio)	Unit-specific, $150-360/kW	90% (0.002 lb/MMBtu floor)	60% (0.002 lb/MMBtu floor)

Sources: PM Incremental Improvement Memo, Sargent & Lundy (2023); Analysis of PM emission control costs and capabilities, Staudt (2023); EPA Memo “2023 Technology Review for the Coal- and Oil-Fired EGU Source Category” (Docket ID. No: EPA-HQ-OAR-2018-0794); Particulate Control Cost Development Methodology, Sargent & Lundy (2017); 2024 Update to the 2023 Proposed Technology Review for the Coal- and Oil-Fired EGU Source Category

Table 2. Unit-Level Control Assumptions for the Final Rule

NEEDS ID	PLANT NAME	UNIT ID	STATE	CONTROL ASSUMPTION
6076_B_3	Colstrip	3	Montana	New FF
6076_B_4	Colstrip	4	Montana	New FF
10143_B_ABB01	Colver Green Energy	ABB01	Pennsylvania	Bag Upgrade
6823_B_W1	D B Wilson	W1	Kentucky	O&M
3944_B_1	FirstEnergy Harrison Power Station	1	West Virginia	Typical ESP Upgrade
3944_B_2	FirstEnergy Harrison Power Station	2	West Virginia	Typical ESP Upgrade
3944_B_3	FirstEnergy Harrison Power Station	3	West Virginia	Typical ESP Upgrade
10343_B_SG-101	Foster Wheeler Mt Carmel Cogen	SG-101	Pennsylvania	Bag Upgrade
8066_B_BW73	Jim Bridger	BW73	Wyoming	O&M
10113_B_CFB1	John B Rich Memorial Power Station	CFB1	Pennsylvania	Bag Upgrade
10113_B_CFB2	John B Rich Memorial Power Station	CFB2	Pennsylvania	Bag Upgrade
2103_B_1	Labadie	1	Missouri	ESP Rebuild
2103_B_2	Labadie	2	Missouri	ESP Rebuild
2103_B_3	Labadie	3	Missouri	ESP Rebuild
2103_B_4	Labadie	4	Missouri	ESP Rebuild
6204_B_3	Laramie River Station	3	Wyoming	O&M
976_B_123	Marion	123	Illinois	Bag Upgrade
6146_B_1	Martin Lake	1	Texas	O&M
6250_B_1A	Mayo	1A	North Carolina	Typical ESP Upgrade
6250_B_1B	Mayo	1B	North Carolina	Typical ESP Upgrade
1364_B_4	Mill Creek (KY)	4	Kentucky	Bag Upgrade
2823_B_B2	Milton R Young	B2	North Dakota	O&M
3954_B_1	Mt Storm	1	West Virginia	O&M
3954_B_2	Mt Storm	2	West Virginia	O&M
3954_B_3	Mt Storm	3	West Virginia	O&M
55076_B_AA001	Red Hills Generating Facility	AA001	Mississippi	Bag Upgrade
55076_B_AA002	Red Hills Generating Facility	AA002	Mississippi	Bag Upgrade
2712_B_4A	Roxboro	4A	North Carolina	Minor ESP Upgrade
2712_B_4B	Roxboro	4B	North Carolina	Minor ESP Upgrade
6183_B_SM-1	San Miguel	SM-1	Texas	O&M
136_B_2	Seminole (FL)	2	Florida	O&M
54634_B_1	St Nicholas Cogen Project	1	Pennsylvania	Bag Upgrade
50611_B_031	Westwood Generation LLC	031	Pennsylvania	Bag Upgrade