EPA 111(D) STAFF ANALYSIS #2: MONTANA BIG PICTURE

TO: Commissioners
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SUBJECT: EPA 111(d)—Staff Analysis #2: Montana Big Picture
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CC: PSC Electric

Our first staff report on EPA's 111(d) Final Rule summarized how the Commission's 15 recommendations on the Draft Rule (submitted to EPA in November 2014) were addressed in the Final Rule, which was released August 3. In this second installment, we present an overview of the generation facilities in Montana affected by the Final Rule and the scope of the compliance challenge facing the state.[1]

MT Electric Generation Units Affected by EPA 111(d)

Generator	Capacity (net MW)	2012 Energy (MWh)	2012 Energy (% of total)	CO2 emissions (tons)	CO2 emissions (% of total)	CO2 rate (lb/MWh)	CO2 w/HRI (tons)
Corrette	153	718,795	5%	864,369	5%	2,405	846,217
Colstrip 1	307	1,297,572	9%	1,626,704	9%	2,507	1,592,543
Colstrip 2	307	1,339,921	9%	1,720,254	10%	2,568	1,684,129
Colstrip 3	740	4,680,658	32%	5,564,141	31%	2,378	5,447,294
Colstrip 4	740	4,932,852	34%	5,855,084	33%	2,374	5,732,127
L & C	53	254,009	2%	334,414	2%	2,633	327,391
CELP	35	301,608	2%	436,051	2%	2,892	426,894
YELP	52	454,794	3%	881,745	5%	3,878	863,228
Hardin	107	467,194	3%	641,774	4%	2,747	628,297
Total	**2,494**	**14,447,403**	**100%**	**17,924,536**	**100%**	**N/A**	**17,548,121**

Table 8/13/15
Capacity, energy production, and emission data (columns 1, 3, and 5) from EPA

The table lists the energy production and CO2 emission data from 2012, the baseline year of 111(d), for the nine generation units affected by the rule. Note that all generation units in Montana affected by the rule are coal-fired.[2]

One of the fundamental changes from the Draft Rule now reflected in the Final Rule is EPA's method of calculating state emission targets. In the Draft, EPA applied four "building blocks" to arrive at state-specific allowable emission rates. In the Final Rule, however, EPA utilizes regional interconnection data to arrive at two source-specific CO2 emission rates for power plants—one emission rate for coal plants and one for natural gas combined cycle plants. As a result, affected power plants are subject to the same standards (in either the coal or natural gas category) no matter what state they are located in.

In the Final Rule, Montana's target emission rate dropped from 1,771 lb/MWh to 1,305 lb/MWh, an increase in required CO2 reduction of 26% from the Draft Rule's target rate. Because electric generation in Montana draws significantly from coal, and because Montana has no natural gas

combined cycle plants, the state now faces one of the largest rate-based reduction requirements among all states, i.e., a reduction from 2,481 lb/MWh (baseline level, 2012) to 1,305 lb/MWh. That is, Montana's CO2 emission rate must decrease by 47%.

The Final Rule allows states to comply with the rule through either a rate-based (pounds of CO2 per MWh produced) or a mass-based (total CO2 tonnage per year) approach. Because the mass-based approach makes it easier to comprehend the scope of a state's challenge in complying with the rule, we'll use it to highlight some general points.

(Important: Several aspects of the rule, including data selection, calculation methodology, emission credits and incentives, interstate trading, interim and phase-in periods, and non-emission strategies, such as energy efficiency and renewable resource development, are absent from this analysis; we will address some of them in future reports. The intent here is to broadly define the dimensions of the playing field, not to envision how the compliance game will be played.)

Using a mass-based approach, Montana must reduce its annual CO2 emissions from 17,924,535 tons to 11,303,107 tons, i.e. 6.6 million tons, or 37%.[3] To get a general idea of the size of that obligation, ignore the target date of 2030 and the various policy routes that might be executed to reach that target over several years, and imagine that the target must be reached immediately. By using the above table, you can construct certain scenarios …

Scenario A

- CO2 reduction required =6.6 M tons
  - ─ heat rate improvement -.4 M tons (EPA value of 2.1%; column 8 in table)
    = 6.2 M tons
  - ─ Corette retirement -.8 M tons (already in effect)
    = 5.4 M tons
  - ─ Colstrip 1 retirement -1.6 M tons (for illustrative purposes; not planned)
    = 3.8 M tons
  - – Colstrip 2 retirement -1.7 M tons (for illustrative purposes; not planned)
- Balance = 2.1 M tons (target not reached)

Scenario B

- CO2 reduction required =6.6 M tons
  - ─ heat rate improvement - .4 M tons (EPA value of 2.1%; column 8 in table)
    = 6.2 M tons
  - ─ Corette retirement -.8 M tons (already in effect)
    = 5.4 M tons
  - – Colstrip 3 retirement -5.4 M tons (for illustrative purposes; not planned)
- Balance = 0 M tons (target reached)

These scenarios add perspective to the relative contribution of certain emission-reduction actions. A collective heat-rate improvement of 2.1%, for example, would achieve about 6% of Montana's required mass-based reduction of 6.6 M tons by 2030. The Corette retirement achieves 12%. A Colstrip 1 retirement would achieve 24%, and a Colstrip 3 retirement would achieve 82%.

Presumably, any operational changes or retirement of fossil generators would be compensated for by efficiency, changing energy markets, and the development of renewable resources and/or low-emission resources. The retirement of, say, Colstrip 1 and Colstrip 2 represents a capacity

loss of 614 MW of baseload power. Replacing all, or a significant portion, of that with non-CO2 or less intensive CO2 resources would require resolved pursuit of a multi-pronged strategy.

Again, these scenarios are illustrative, intended to characterize the magnitude of Montana's compliance challenge, not to suggest a compliance strategy. Montana, as most states, will probably strive to produce a plan that blends numerous policies and resource decisions over a span of 15 years to comply with the rule, and it's impossible to say at this time how such a plan will affect any particular existing generator.

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[1] This analysis is based on the presumption that the 111(d) Final Rule takes effect as it was released on August 3, and it looks at the "scope of the compliance challenge facing the state" from a regulatory perspective. It does not examine the legal challenges to the rule or the myriad economic or environmental implications of the rule.

[2] YELP burns petroleum coke, but EPA treats that fuel as coal in 111(d).

[3] The choice of a rate-based, as opposed to mass-based, compliance approach could change the long-term quantity and interim-period timing of required emission reductions. We'll examine and compare the two compliance approaches in a future report.