High Level Summary

Coal Combustion Residuals Recycling/Beneficial Use Assessment Business Plan

Overview of Coal Combustion Residuals

For decades, coal-fired generation was the primary source of power generation. Only recently has coal been displaced by cleaner sources of electricity. The process of using coal to generate electricity results in a byproduct known as coal combustion residual (CCR) or "coal ash." Storage of CCR in a wet impoundment was a common and accepted practice dating back many decades.

There are four Dominion Energy facilities in Virginia with such impoundments:

- Bremo Power Station in Fluvanna;
- Chesapeake Energy Center;
- Chesterfield Power Station; and
- Possum Point Power Station.

Of these facilities, only Chesterfield still generates electricity from coal. Coal ash impoundments were also present at two non-Dominion Energy facilities in Virginia, both operated by Appalachian Power Company.

2015 CCR Rules

In 2015, the Obama Administration finalized rules requiring permanent closure of all CCR impoundments within 15 years. The 15-year requirement assumes all allowable extensions are granted—such extensions are not automatic. After extensive public comment, the Obama Administration determined that CCR should be regulated as solid waste (not hazardous waste). The final rule also determined that there were three permissible approaches for accomplishing closure. These are capping the impoundment in place onsite after removing, testing, and treating the water; beneficially reusing the material; or removal to a permanent storage facility. The Commonwealth of Virginia subsequently adopted its own rules largely incorporating the federal rules.

Virginia General Assembly Action

During the 2017 General Assembly, a Governor's amendment was accepted that placed a one-year moratorium on issuance of closure permits for any coal ash impoundment in the Chesapeake Bay watershed (in effect for Dominion Energy facilities). Closure of CCR impoundments in Western Virginia was allowed to proceed. The legislation also required a report on the costs of closure options. This report was completed in December 2017.

The 2018 General Assembly enacted follow-up legislation that allowed closure to proceed for former impoundments where all of the CCR material had been removed but continued the moratorium for other impoundments. The legislation also required a request for proposal (RFP) process and preparation of a business plan for beneficial reuse ("recycling"), which accompanies this summary.

2018 RFP and Business Plan Process

As required by the 2018 legislation, Dominion Energy conducted a RFP process for throughout the summer. The extensive process included informational meetings, pre-bid meetings, and site visits**.** Bidders were asked to recycle as much as possible in 15-year timeline, to comply with federal and state regulations.

The process culminated in complete bids for recycling into encapsulated beneficial uses from four bidders.

In preparing this business plan, Dominion Energy analyzed these bids. Hybrid approaches were also evaluated.

The proposals estimate that, of the 27.3 million cubic yards of ash available, about 45% of the ash (12.5 M cubic yards) can be recycled in the 15-year timeframe.

It should be noted that the two-year delay necessitated by state action did not change the federal compliance timeline nor can subsequent state action do so. Accordingly, the time for delay has run out. The 2019 General Assembly will have the options of either setting a new policy or allowing compliance with existing federal and state law and regulation to move forward. Further delay is not a practicable option.

Range of Potential Recycling Costs

All permissible approaches to closure of the coal ash impoundments in Dominion Energy's Virginia service territory have significant costs. In moving forward, Dominion Energy is focused on ensuring the best value for customers while fully complying with the federal and state regulations designed to protect the environment and public health.

Bidders on the beneficial reuse RFP were asked to provide bids for proven encapsulated reuses. This is the preferred approach contemplated by the rules and by the 2018 legislation. Encapsulated reuse means the ash is bound in a solid form to ensure the reuse protects the environment. The range of costs for encapsulated beneficial reuse are shown in Table 1. Costs shown are net costs after any anticipated revenues identified by the bidders.

The costs range from $2.773 billion to $3.358 billion if materials from all four sites are recycled by awarding all of the work to one company. These offers would recycle around 45 percent of the ash over the 15-year timeframe.

If multiple bidders were to be selected, the costs range from $2.345 billion to $5.642 billion if material at all four sites were to be recycled by multiple bidders to the maximum extent feasible within the required timeframe.

In both cases, these costs include some project management and certain overhead costs, but such costs are not necessarily fully accounted for.

Table 1

Range of Costs by Site for Beneficial Reuse

Site	**CCR Volume in cubic yards**	**Cost Range— (excluding project management costs, O&M, etc.)**	**Cost Range— (including project management costs, O&M, etc.)**
Bremo	6.2 million cubic yards	$277-$934 million	$375 million - $1.203 billion
Chesapeake	2.185 million cubic yards	$193-$449 million	$269 - $592 million
Chesterfield	14.9 million cubic yards	$1.072 billion to $2.264 billion	$1.403 - $2.905 billion
Possum Point	4 million cubic yards	$216 million to $727 million	$298 - $942 million
Total for all 4	27.285 million cubic yards	$1.758 billion to $4.374 billion	$2.345 - $5.642 billion**

**Excludes projected spend of $458 million through the second quarter of 2019 for costs that will be incurred at the facilities regardless of how they are closed such as water treatment.

Traffic Effects

The report examined both trucking and rail to transport material for beneficial reuse. Trucking is the lower cost option of the two. Rail transport requires additional handling (among other reasons for the higher cost). The bids received resulted in the following traffic estimates (Table 2).

Table 2
Estimated Truck Traffic for Beneficial Reuse Approaches by Site

Facility	Truck Trips Per Day	Duration
Bremo	124 to 161	10 to 11 years
Chesapeake	65 to 143	5 to 11 years
Chesterfield	278 to 300	15 years
Possum Point	105 to 114	7 to 11 years

Hybrid Approaches

As was noted during the joint subcommittee's most recent meeting, most utilities in the Eastern United States are pursuing a hybrid approach. A hybrid approach means more than one strategy is used to complete closure of CCR impoundments. It should be emphasized that many if not most of these projects are still in the conceptual stage.

Examples of hybrid approaches that could be considered across sites in Virginia include but are not limited to an enhanced cap and closure plan (such as closure and construction of slurry walls) or a combination of recycling and landfilling. The same approach may well not make sense at all four sites.

Next Steps

During the 2019 General Assembly, Dominion Energy stands ready to provide any analysis necessary for policy makers to determine whether to implement a new policy or to allow the regulatory process to proceed. However, deadlines for compliance with various provisions of the rule are approaching. Any further delay will make meeting the required timelines and other obligations in the rule increasingly more difficult. Delay will also make recycling proportionally less feasible.

It should also be noted that these costs are legacy costs. Long-standing public policy dictates such costs should be equitably shared by all customers. This cost sharing includes large customers who have exercised the "competitive shopping" options available to such customers in state law. The alternative to equitable cost sharing would be to impose proportionally greater costs of the ongoing transition to clean energy on residential and small business customers.