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The Potential for Significant Pellet Fuel Demand in Poland

(plus, an update dashboard)

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There is justified angst over the likely significant drop in fuel pellet demand when the UK's so-called Bridge Policy kicks in after March 2027. FutureMetrics and other consultants expect a drop in UK demand of at least 4.0 million tonnes per year. Some estimates are for a drop of nearly 4.5 million tonnes per year. The Dutch market is also uncertain and demand for pellet fuel may fall there as well.

But there is a possible bright spot. The potential for increased demand for pellets replacing coal in power generation in Poland has been discussed for several years. It would appear that the time for serious consideration has come.

The pathway is via the capacity markets in Poland.

Capacity markets in the power sector are a support mechanism that provides payments to generators for being ready to supply power during periods when the grid is challenged by supply-side shortfalls or transmission problems. Poland's capacity market has been in place since 2018.

As of the most current auction, a total of about 20.4 GWs was contracted in Poland's capacity market. Current total contracted capacity is about 18 GWs. But future contracted capacity declines steadily into the 2030's to well below 10 GWs even as future demand for electricity is expected to increase¹.

The critical requirement for being qualified for Poland's capacity market is a limit on CO₂ emissions per MWh.

From July 1, 2025, only units emitting below 550 kg CO₂/MWh are eligible for state aid in the capacity markets. But Poland, on January 24, 2025, amended the Capacity Market Act to allow time for transition into the lower emissions level. High-emission units can continue to generate until end of 2028².

Coal plants have been absent from recent auctions, but cumulative awards from past Polish auctions have about 7.9 GWs of coal fueled generation through 2028 and just under 4 GWs from 2029 to 2035. However, coal units emit too much CO₂ per MWh to be allowed to participate in the capacity markets after 2028.

Coal fueled power generation units, depending on the type of coal and on their efficiency emit between 800 and 1,200 kg of CO₂ per MWh. Thus, all coal fueled units in Poland will be unavailable for the capacity markets after 2028. And no new coal plants can bid into current auctions.

¹ See [HERE](#).

² See [HERE](#).



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This paper offers a way for some of those units to continue to support the capacity markets and support the stable transition to a lower carbon emitting power sector that the Polish government envisions.

How? By co-firing sustainably sourced coal replacement solid fuel.

As many FutureMetrics white papers have shown, the use of densified and upgraded biomass to replace coal is a proven solution already deployed in many countries in utility scale power stations that use pulverizing technology in their power boilers.

And, as many FutureMetrics white papers have explained, if the fuel is sourced from renewing bioresources, there is no new net carbon added to the atmosphere when combusted in a power boiler.

That is, using sustainably sourced pellet fuel lowers net CO₂ emissions per MWh generated.

Polish coal fueled power stations can co-fire at some ratio that will lower their CO₂ emissions per MWh to below the 550 kg/MWh limit.

There are 92 coal fueled units in Poland that have outputs of 80 MWs or greater (this interactive [MAP](#) has all 91 stations with information on each). Most are older (see Figure 2 on the next page) and most of their boilers are lower efficiency “subcritical” designs.

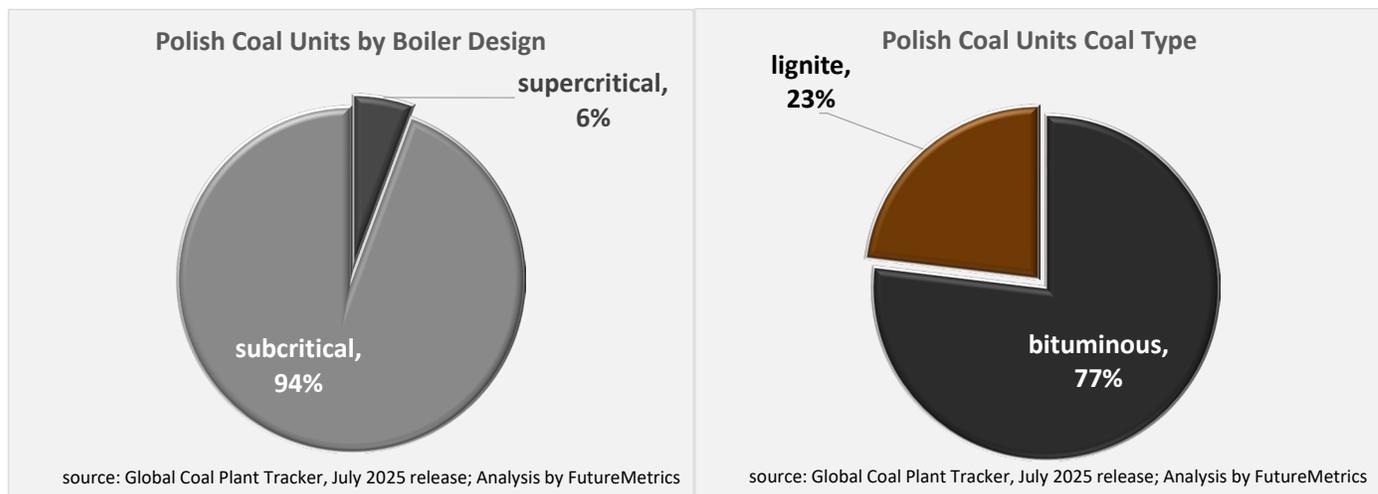


Figure 1 - Polish Coal Stations by Boiler Design and Coal Type

Almost a quarter of the units that are 80 MWs or larger use lignite³. Switching from lignite to pellet fuel may not require any modifications to coal mill capacity, fuel feeder pipes, and burners.

³ More on lignite [HERE](#).



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About 80% to 90% of coal used in Polish power generation is mined in Poland. The statistics are almost opposite for natural gas. About 75% to 80% is imported⁴.

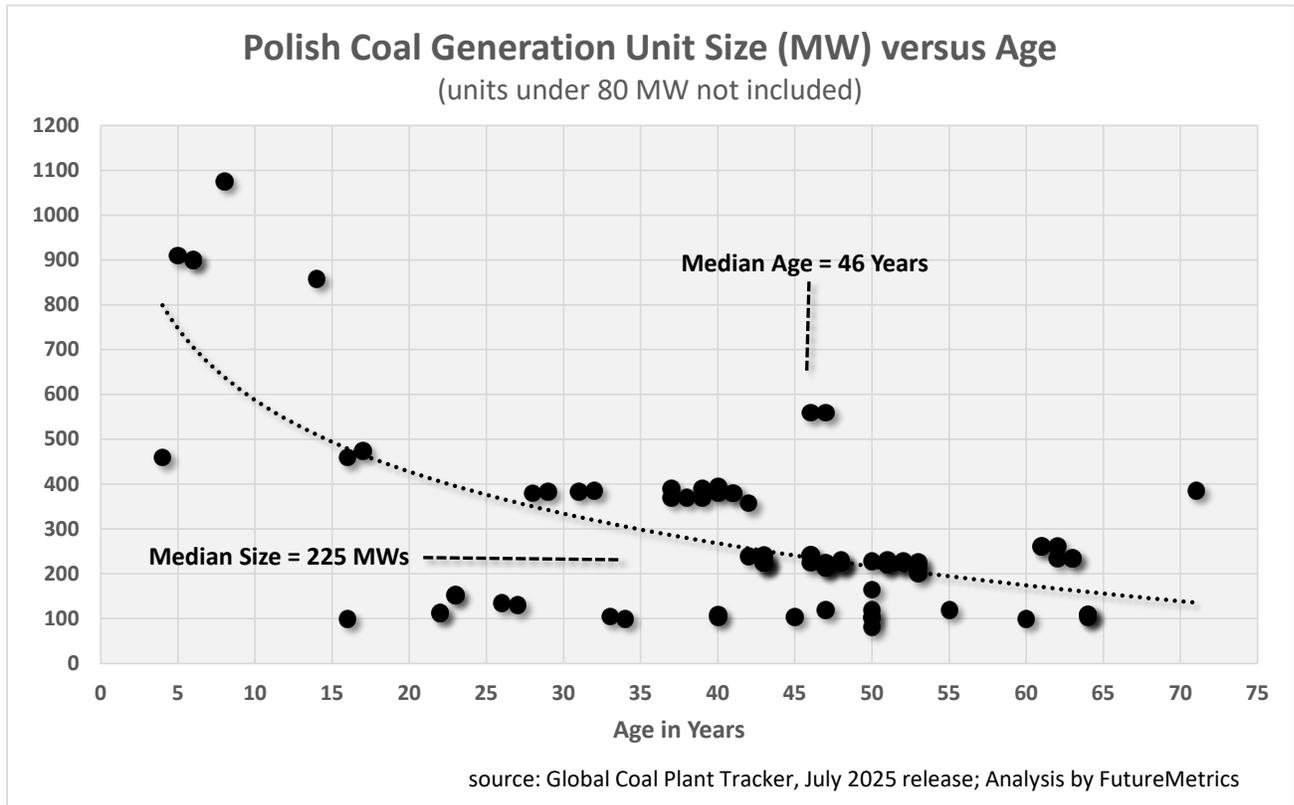


Figure 2 - Polish Coal Fired Units >80MWs - Age and Size

It is likely that most of the coal fired units could, with relatively modest modification, co-fire wood pellet fuel.

What co-firing ratio would it take for a Polish coal fired unit to be in compliance so that it could participate in the capacity market?

FutureMetrics has designed a dashboard that answers that question.

A screenshot of the dashboard is on the next page. This and many other fully interactive dashboards are free to use at the FutureMetrics [website](#). A direct link to this dashboard is [HERE](#).

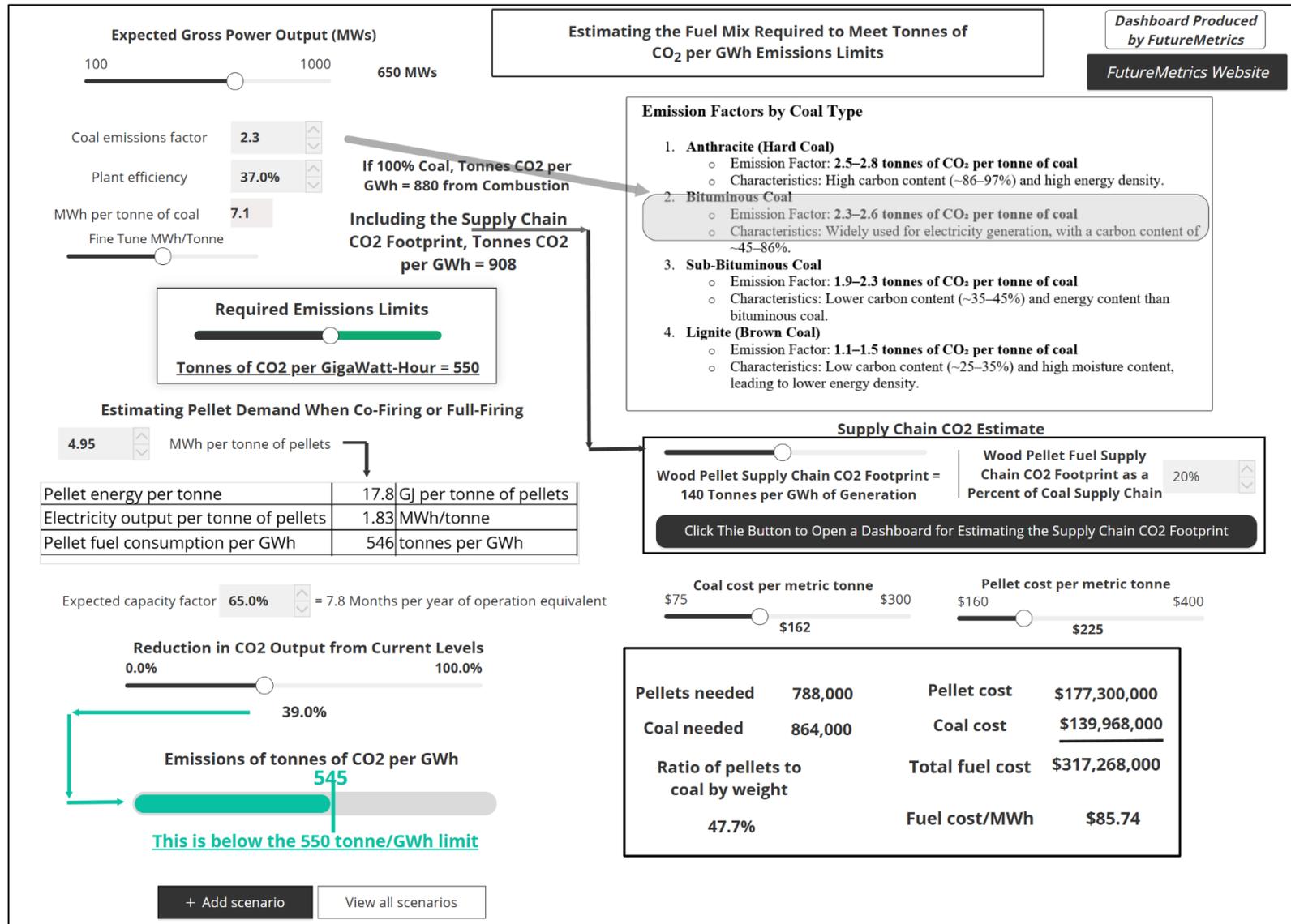
An explanation of the controls, outputs, and insights begins on page 5.

⁴ See [HERE](#).



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All of the default settings can be changed by the user. The user is encouraged to experiment with different input assumptions. The user can also save scenarios for later recall using the control at the lower left of the dashboard.

The user-driven analysis calculates the co-firing ratio needed to get the unit's CO₂ emissions below the required limit. The emissions shown in the dashboard are in tonnes of CO₂ per gigawatt-hour (GWh)⁵.

At the default settings, seen when the dashboard is first opened, a 650 MW unit using bituminous coal at an efficiency of 37%, which yields about 7.1 MWh's of electricity per tonne consumed, would need a ratio of pellets to coal of about 47% (by weight). Given the assumptions on the energy densities of the coal and pellets, and the assumed capacity factor of 65%, that plant would need about 768,000 tonnes per year of pellet fuel along with about 864,000 tonnes per year of coal.

All of the input assumptions can be changed. The calculated emissions are illustrated in the graphic in the lower left of the dashboard. If the generating unit is complying, it will be colored green. If it is not in compliance, the color will turn red.

By moving the slider control that is just above the colored graphic ("Reduction in CO₂ Output from Current Levels") the unit can be put back into compliance, and the co-firing ratio and tonnages in the lower right will be updated.

Conclusion

The transition to a lower carbon power sector should recognize the benefits of diversifying the supply of on-demand generation. Only depending on natural gas (NG) fueled generation from mostly imported NG for future supply growth and for the capacity markets lowers the resiliency of the power grid. Wind and solar combined with energy storage will play an increasing role. But the build out to a scale that can fully energize the grid most of the time is decades away.

At least for the next decade or more, dispatchable power will be needed.

There is a way to keep some of the high emitting coal stations operating for that timespan.

As this brief paper has shown, gigawatts of Polish generation capacity that is currently 100% reliant on coal could participate in the capacity markets beyond the 2028 deadline. Assuming the UK demand drops by 4.5 million tonnes per year in 2027, and replicating the unit used in Figure 3 with all of its input assumptions unchanged, there would be enough pellet fuel already being produced to supply 5.7 of those units (3.7 GWs of capacity at the assumed 65% capacity factor). Most pulverized coal generating units in Poland are smaller, but the aggregate electricity output from 4.5 million tonnes of pellet fuel using the example dashboard assumptions, would be similar.

There is a realistic potential for significant new demand for pellet fuel in Poland.

⁵ Metric tonnes per GWh are equal to kilograms per MWh. For example, 550 tonnes of CO₂ per GWh is the same emissions rate as 550 kg of CO₂ per MWh.