Background

According to the U.S. Energy Information Administration (E.I.A.), in 2019 the annual average heat content of coal consumed was approximately 19.26 $\frac{MMBTU}{Short-Ton}$. Additionally, this value can be calculated directly from form EIA-923 (Page 5, Fuel Receipts and Costs). This is done in python script 'coal.py', for regulated, and unregulated coal plants.

Figure 1: Average heat content of coal, 2019.

From the 2020 version of EIA-923, the annual average heat content of coal consumed by all coal plants was calculated to be 20.73 $\frac{MMBTU}{Short-Ton}$. This is the value that will be used in fuel cost, and marginal cost of fuel calculations.

MCF calculation

Now that we have the annual average heat content of coal, we will need an up-to-date value for the annual price of coal delivered to the electric power sector.

Respectively, Figures 2 and 3 show the average annual price of coal ($\frac{\$}{Short-Ton}$) from 2009-2019, and price projections for 2020 onward. For the purpose of this calculation, I take the average annual price of coal to be $\frac{\$40}{Short-Ton}$.

So, the estimated average annual cost of fuel (coal), in units of $\frac{\$}{MMBTU}$ is given by:

$$\frac{\$40}{Short-Ton} \times \frac{Short-Ton}{20.73MMBTU} = 1.93(\frac{\$}{MMBTU})$$

As seen in Figure 4, 1.93 ($\frac{\$}{MMBTU}$) is approximately equal to the 2 ($\frac{\$}{MMBTU}$) value given by the EIA in one of their Monthly Energy Reviews.

From here, MCF is calculated by multiplying the estimated average annual cost of fuel by each unregulated coal plant's heat rate ($\frac{Annual\ Consumption\ (MMBTU)}{Annual\ Net\ Generation\ (MWh)}$). The necessary information to calculate each plant's heat rate is provided in EIA-923, and is carried out in 'coal.py'.

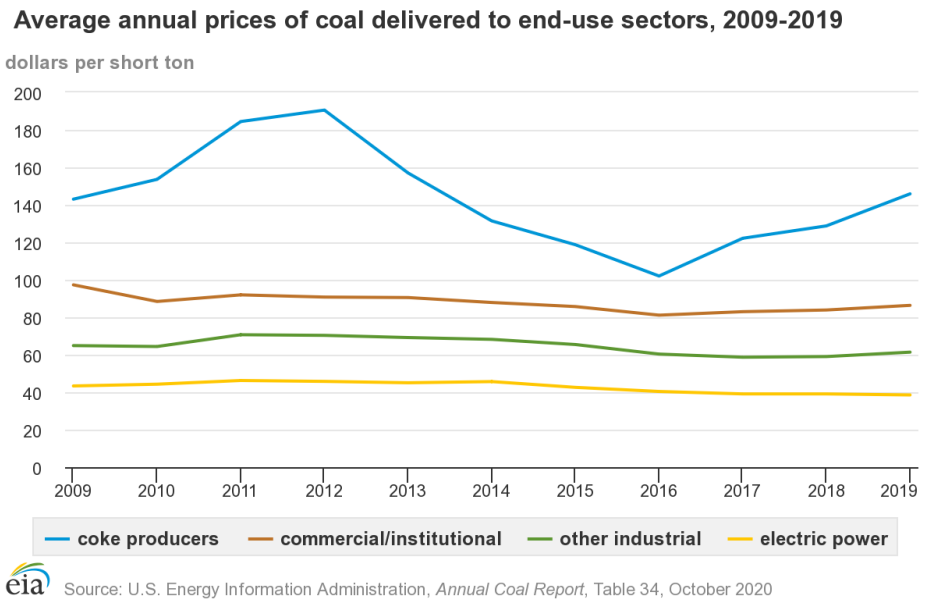

Figure 2: From the EIA Annual Coal Report, 2020.

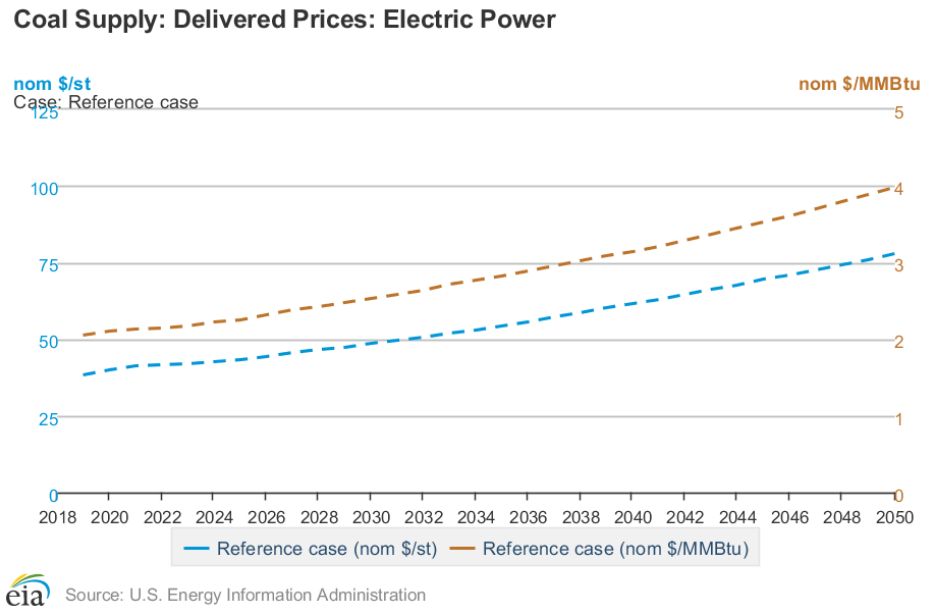

Figure 3: Projected average annual cost of coal delivered to the electric power sector. From the EIA.

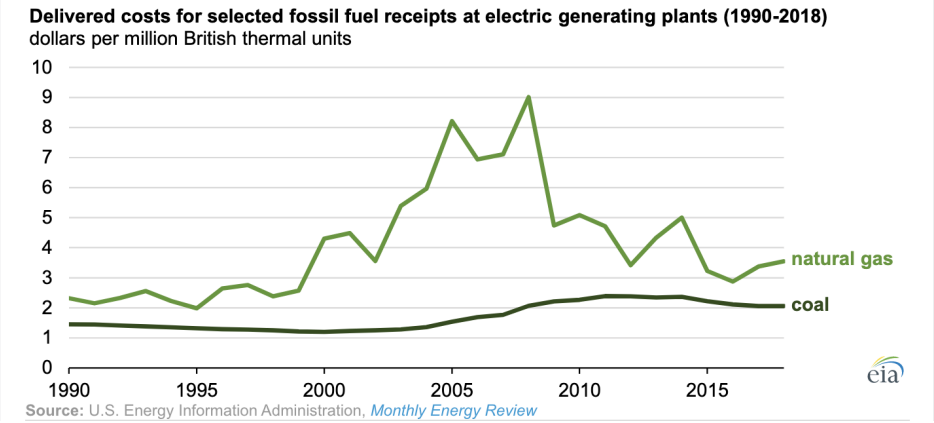

Figure 4: Delivered costs for coal fuel receipts in $\frac{\$}{MMBTU}$.