The Context

The American Energy Market Regulator (AEMR) is responsible for looking after the United States of America's domestic energy network. The regulator's responsibility is to ensure that America's energy network remains reliable with minimal disruptions, which are known as outages.

The Problem

Recently, the AEMR management team has been increasingly aware of a large number of energy providers that submitted outages over the 2016 and 2017 calendar years. Therefore, the following analysis has 2 major goals:

Goal 1

Analysing how many outages were approved in comparison to those that are canceled.

Goal 2

Understand which of these outage events has the longest average duration offline.

Goal 3

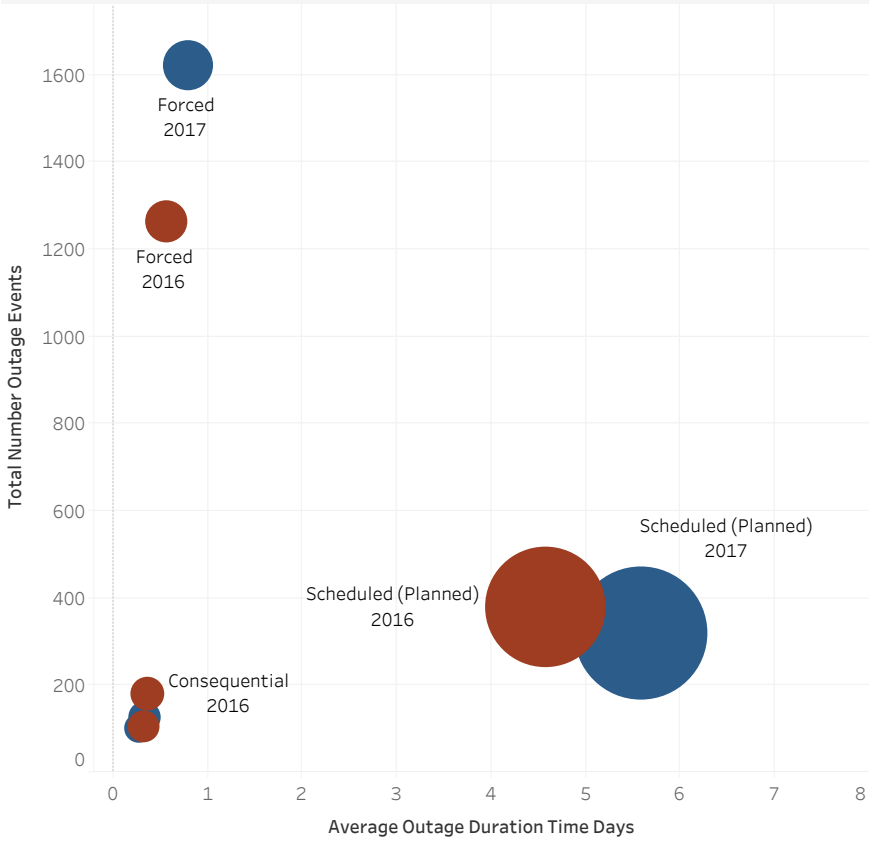
Clarifying which assets are the most unreliable.

Goal 4

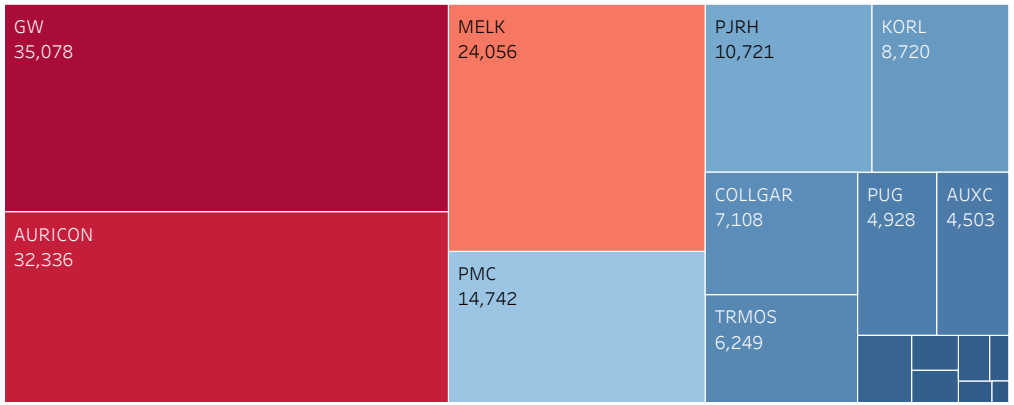
Identifying which participant code has lost the most amount of energy due to outages in 2016, and in 2017.

Forced outages represent the majority of enery outages, and have increased in both frequency and duration in 2017. Investigations should focus on providers MELK, AURICON and GW, which seem to be most unreliable providers.

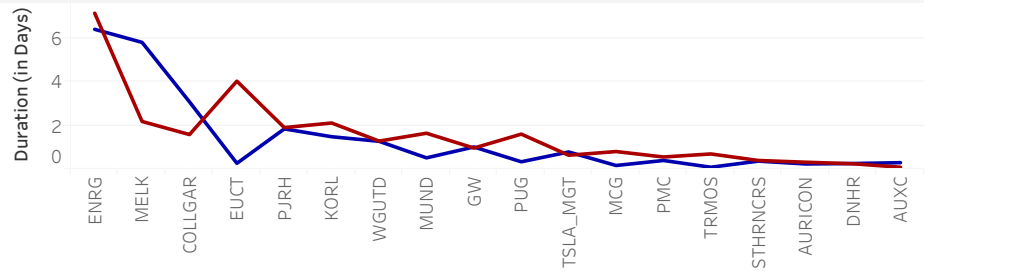
The data shows that forced outages **represent the majority of outage events**, and have **increased in 2017** both in frequency and duration. (Source: AEMR dataset)



Across all years, GW , AURICON and MELK standout as the providers with the **highest levels of energy lost to forced outages**. Investigations should be directed at understanding why these providers have such frequent outages. (Source: AEMR dataset)

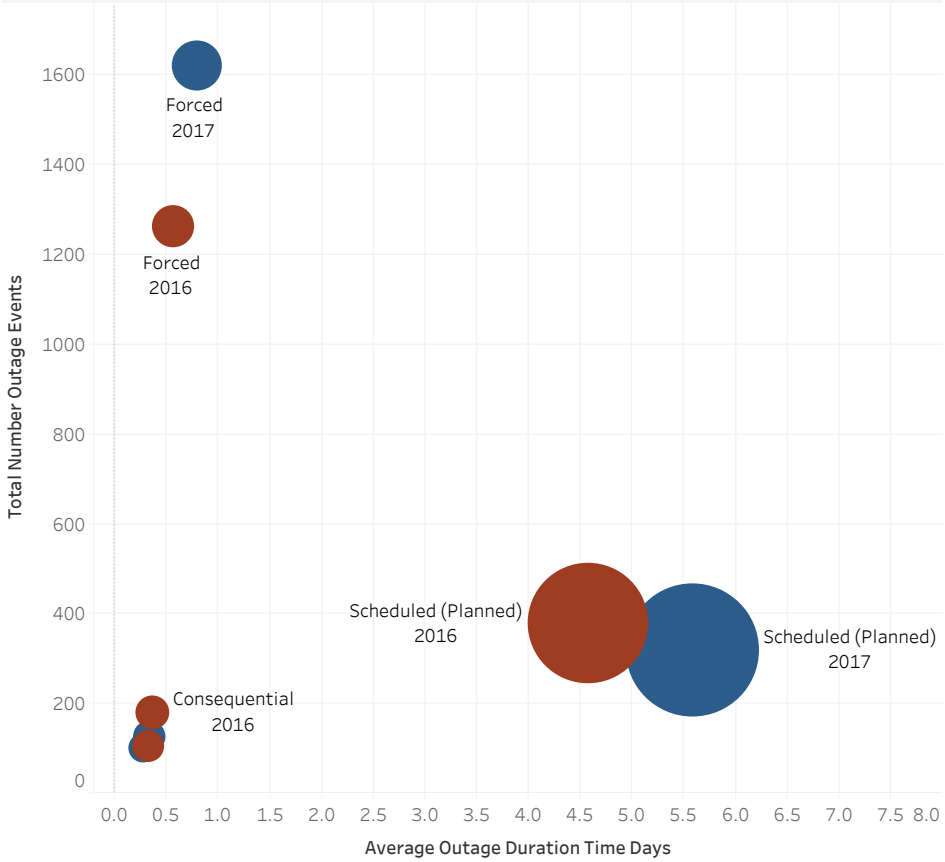


The provider ENRG has the **longest outages (in days)** both in 2016 and 2017. Punitive measures should focus on ENRG and MELK (which has significantly increased its outage duration in 2017); EUCT, MUND and PUG saw significant decreases in 2017, which suggests corrective actions are being successfully taken. (Source: AEMR dataset)

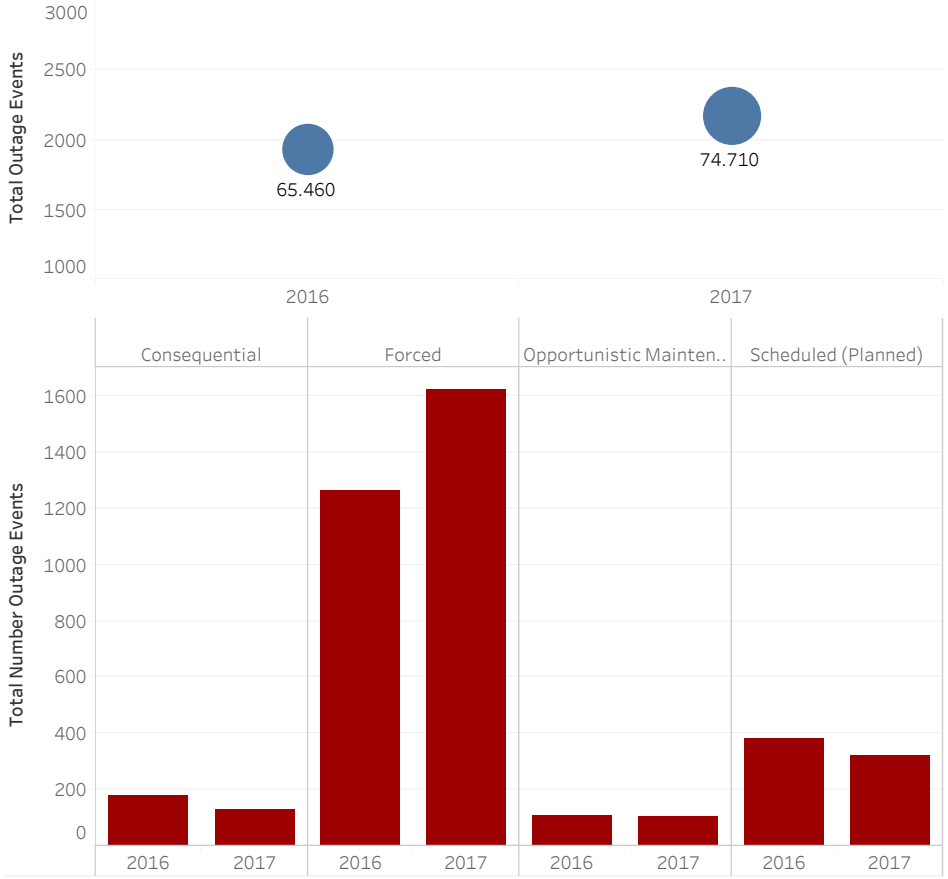


Forced outages constitute the majority of outages in 2016 and 2017, and have increased in duration in 2017. However, scheduled outages are still the ones that last longer.

The data shows that forced outages **represent the majority of outage events**, and have **increased in 2017** both in frequency and duration. (Source: AEMR dataset)

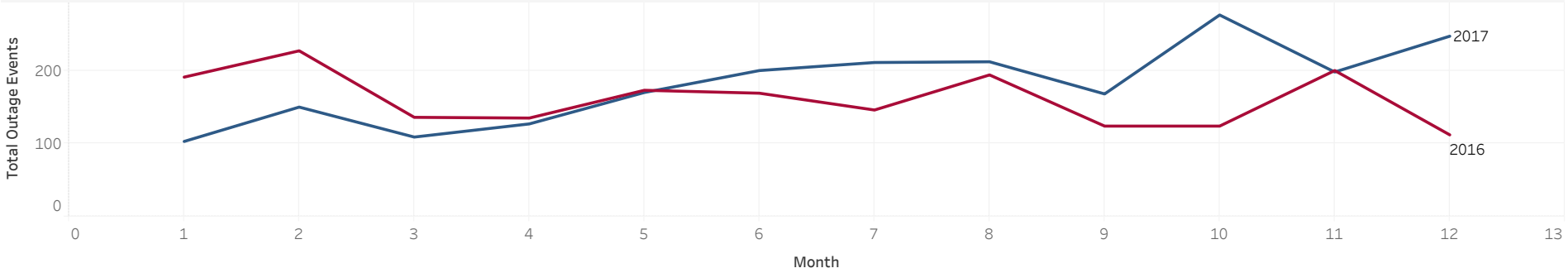


Forced outages constituted 65.5% of all outages in 2016, and 74.4% in 2017. (Source: AEMR dataset)

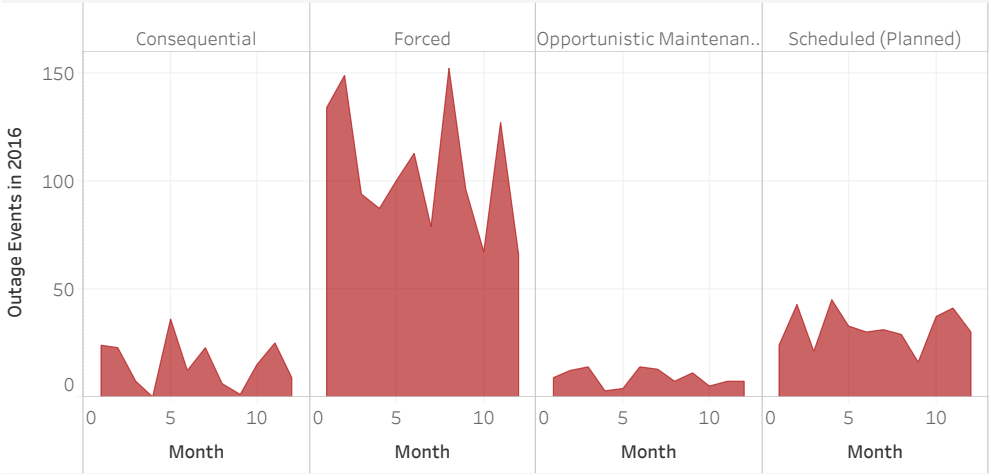


Forced outages are the most frequent type across the 12 months of both 2016 and 2017. There doesn't seem to exist any clear seasonality to energy outages across both years.

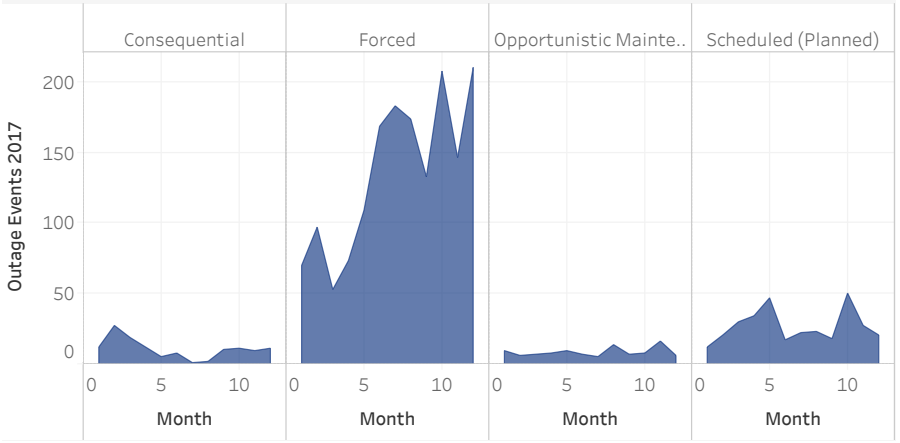
The data suggests that there is **no month when energy outages are consistently more frequent** across years. In 2017, there was a consistent increase in outages between March and August. (Source: AEMR dataset)



Frequency of outage events in 2016. (Source: AEMR dataset)

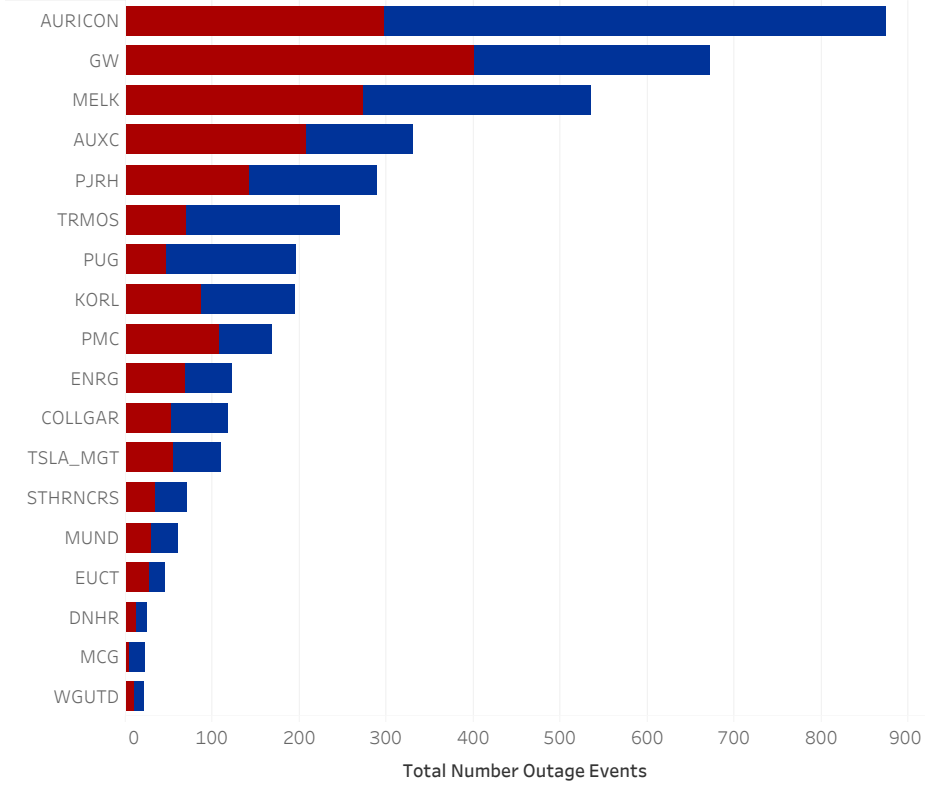


Frequency of outage events in 2017. There was a particularly consistent **increase in forced outages between March and August.** (Source: AEMR dataset)

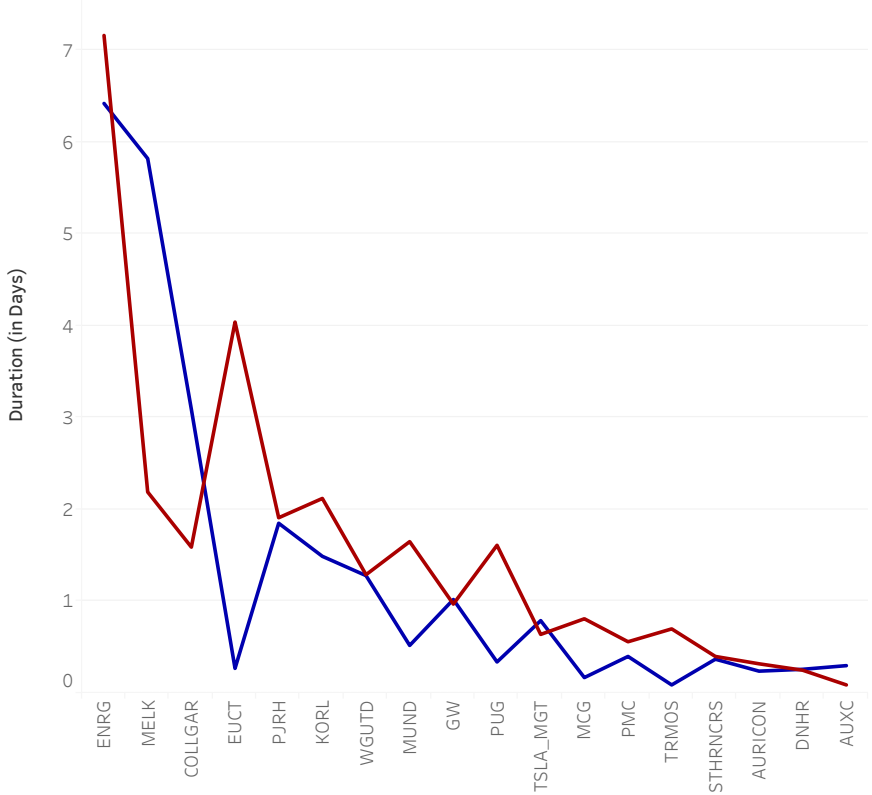


AURICON, GW and MELK are the providers that had more frequent outages across both years, while ENRG and MELK have the longest ones. Overall, MELK seems to have been the most unreliable provider across both years.

The providers AURICON, GW and MELK stand out as having **more frequent outages across both years**. AURICON, TRMOS and PUG saw significant increases in outage frequency in 2017, so investigations should be deployed to understand its causes. AUXC and PMC saw significant decreases, which suggests corrective measures and being successfully implemented. (Source: AEMR dataset)

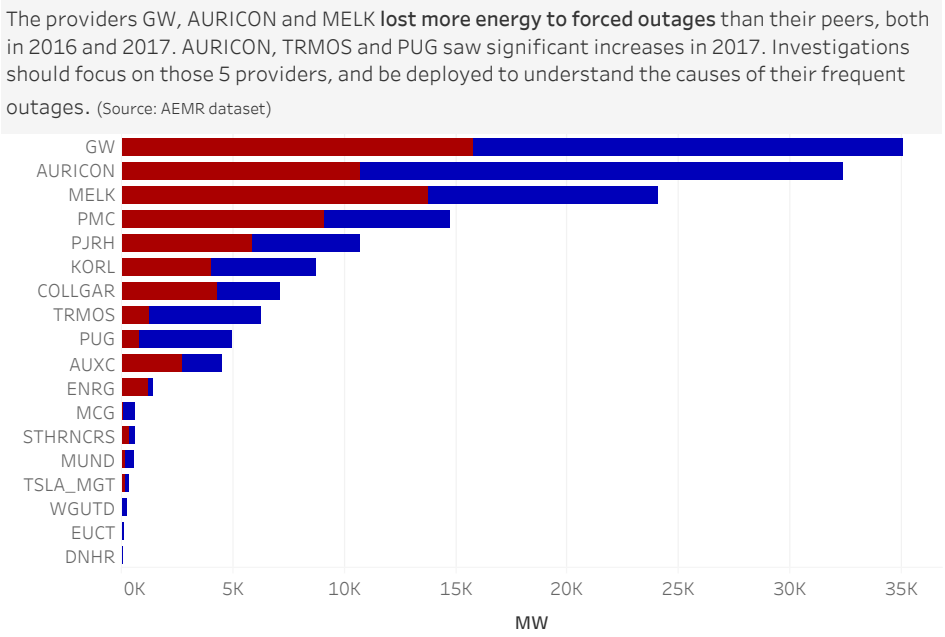


The provider ENRG has the **longest outages (in days)** both in 2016 and 2017. Punitive measures should focus on ENRG and MELK (which has significantly increased its outage duration in 2017); EUCT, MUND and PUG saw significant decreases in 2017, which suggests corrective actions are being successfully taken. (Source: AEMR dataset)

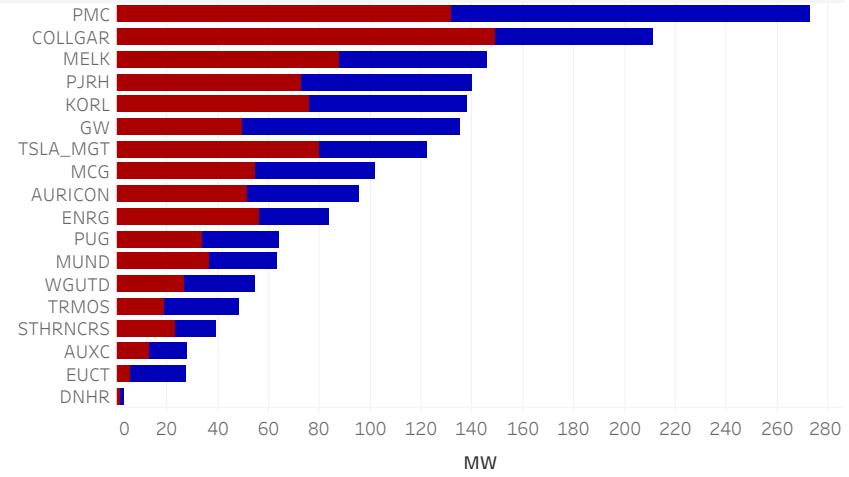


The providers GW, AURICON and MELK seem more unreliable in terms of energy lost to forced outages. However, PMC stands out as having the highest average of energy lost per outage in both 2016 & 2017.

The providers GW, AURICON and MELK **lost more energy to forced outages** than their peers, both in 2016 and 2017. AURICON, TRMOS and PUG saw significant increases in 2017. Investigations should focus on those 5 providers, and be deployed to understand the causes of their frequent outages. (Source: AEMR dataset)



The providers COLLGAR and PMC standout as having **more energy lost per forced outage** across years, which suggests longer outages. COLLGAR significantly reduced its average in 2017, while GW significantly increased it. Investigations should be deployed to understand how COLLGAR, PMC and GW and take more efficient corrective measures to reduce time offline. (Source: AEMR dataset)



Across all years, GW , AURICON and MELK standout as the providers with the **highest levels of energy lost to forced outages**. Investigations should be directed at understanding why these providers have such frequent outages. (Source: AEMR dataset)