NET ZERO STRATEGY

SAN LUCIA

trusted consulting

since 2025

Disclaimer

Authors

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EXECUTIVE SUMMARY

San Lucia is a vibrant community that is committed to transitioning to 100% renewable electricity by 2030. In 2023, the San Lucia City Council commissioned a report from Dodgy Consultants Incorporated (DCI) for advice on how to utilise the existing solar and wind farms to provide sufficient Variable Renewable Energy (VRE) and propose a solution that would meet the city's forecasted demands in 2030 whilst minimising spilled energy and unserved demands (blackouts). After the release of DCI's proposal, the mayor of San Lucia has requested that Trusted Consulting conduct a review of the proposal and provide alternative recommendations for consideration by the city council.

As part of this report, Trusted Consulting has calculated the annual forecasted demand at 4027 GWh and charted the hourly demand profiles for each month of the year.

Trusted Consulting has also reviewed DCI's Proposal and found that although there are some advantages to their approach there are some technical errors due to insufficient granularity of the analysis (monthly instead of hourly), poor selection of wind turbines, lack of battery management constraints and no inclusion of levelized cost of energy and storage or total system cost.

Due to the over-reliance on battery storage to meet peak demand and account for seasonal variability, Trusted Consulting estimated the total system cost at $101 billion, and therefore concludes that San Lucia City Council should reject Dodgy Consultant Incorporated's proposal.

Instead, Trusted Consulting recommends that San Lucia City Council adopt the following measures:

1. Take a centralized approach towards building out variable renewable energy and storage as part of its commitment to transition to 100% VRE to avoid issues with private solar and wind farm operators installing insufficient generation due to the risk of curtailment.
2. Install 4568 MW of VRE with an annual nameplate capacity of 40,016 GWh and 10750 MWh of energy storage for a total system cost of $15,515 million.
3. Engage with the local community early to ensure all stakeholder's concerns are met.
4. Conduct environmental studies to ensure that the aforementioned plans at each site will not negatively impact native flora, fauna and ecosystems.
5. Conduct additional consultation with industry for expressions of interest in Renewable Energy Zones to fully utilise spilled energy instead of curtailing it through strategies such as flexible demand, thermal storage and green hydrogen/ammonia production.

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INTRODUCTION

San Lucia is a vibrant community that is committed to transitioning to 100% renewable electricity by 2030. In 2023, the San Lucia City Council commissioned a report from Dodgy Consultants Incorporated (DCI) for advice on how to utilise the existing solar and wind farms to provide sufficient Variable Renewable Energy (VRE) and propose a solution that would meet the city's forecasted demands in 2030 whilst minimising spilled energy and unserved demands (blackouts).

After the release of DCI's proposal, the mayor of San Lucia has requested that Trusted Consulting conduct a review of the proposal and provide alternative recommendations for consideration by the city council.

REVIEW METHODOLOGY

As part of this review, Trusted Consulting believed that the best approach to meet San Lucia City Council's needs was to analyse the system demand and DCI's proposal before stepping through the various iterations of Trusted Consulting's proposal before finally summarising the final proposal in the conclusion and recommendations.

SAN LUCIA SYSTEM DEMAND

Based upon the demand data provided by San Lucia City Council, Trusted Consulting has compiled the energy demand and average power for each month as shown in **Error! Reference source not found.**. As indicated in the table, annual demand is forecast to be 4027 GWh which is in concordance with DCI's analysis.

Table 1 – San Lucia Energy Demand and Average Power for 2030

	Energy Demand (MWh)	Energy Demand (GWh)	Average Power (MW)
Jan	371396	371	499
Feb	355347	355	529
Mar	353581	354	475
Apr	310519	311	431
May	321636	322	432
Jun	331835	332	461
Jul	350736	351	471
Aug	340687	341	458
Sep	320969	321	446
Oct	309670	310	416
Nov	322107	322	447
Dec	338483	338	455
Annual	4026965	4027	460

HOURLY DEMAND PROFILES

Below are the hourly demand profiles for each month, grouped into the four seasons. As can be seen from the average demand for each month (shown in red), November to April tends to exhibit a flatter demand curve, whilst May to October tends to show 2 definitive peaks, centred around 6am and 6pm.

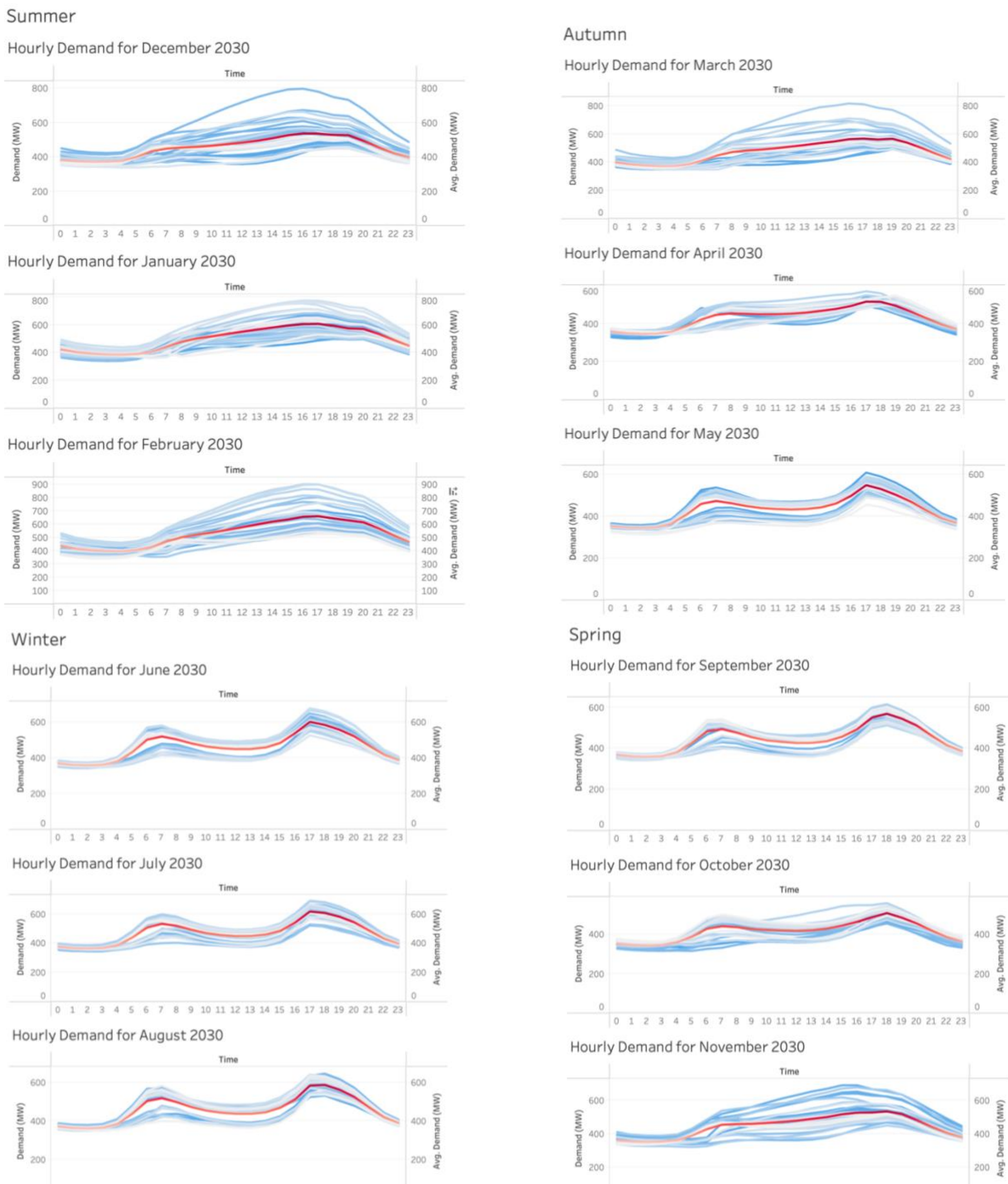

Figure 1 - Hourly Demand Profiles for each Month

DCI PROPOSAL EVALUATION

San Lucia City Council commissioned Trusted Consulting to review a report titled 'Net Zero Off Grid Strategy for San Lucia' by Dodgy Consultants Incorporated (DCI) [1].

SUMMARY

The main recommendation provided by DCI can be summarised as follows:

- 110 wind turbines at Bango for a nameplate capacity of 418 MW.
- 110 wind turbines at Coopers Gap for a nameplate capacity of 418 MW.
- 1.1 million solar panels at Kidston for a nameplate capacity of 385 MW.
- 1.1 million solar panels at New England for a nameplate capacity of 385 MW.
- A battery to shift peak and seasonal demand with a capacity of 257000 MWh.

ASSUMPTIONS

Trusted Consulting assumes that:

- DCI uses solar panels with a nameplate capacity of 350W, an efficiency of 18.4%, an area of 1.2m^2 and temperature coefficients of Alpha = 2.1e-7, Beta = 5.3e-3 and a Reference temperature = 25°C.
- DCI uses wind turbines with a nameplate capacity of 3800 kW, a Cut-in wind speed of 3 m/s, a Cut-out wind speed of 25 m/s, a Hub Height of 115m, a Rotor length (diameter) of 130m and a power output curve of $\frac{3800}{1+e^{-k(v-v_0)}}$ where k = 0.7 and v0 = 7.5.
- Coopers Gap has an Alpha of 0.16, a Reference Height of 10m and an air density of 1.2 kg/m^3.
- Bango has an Alpha of 0.14, a Reference Height of 15m and an air density of 1.2 kg/m^3.
- DCI recommended a 684 MW lithium-ion battery with a 376 hour capacity (since the maximum demand that needs to be met by the battery is 684MW).

SUPPLY AND DEMAND

As part of Trusted Consulting's review of DCI's Proposal, the average hourly supply curves for each site using DCI's recommendations are shown in Figure 2 and compared to San Lucia's average hourly demand curve for 2030 calculated earlier.

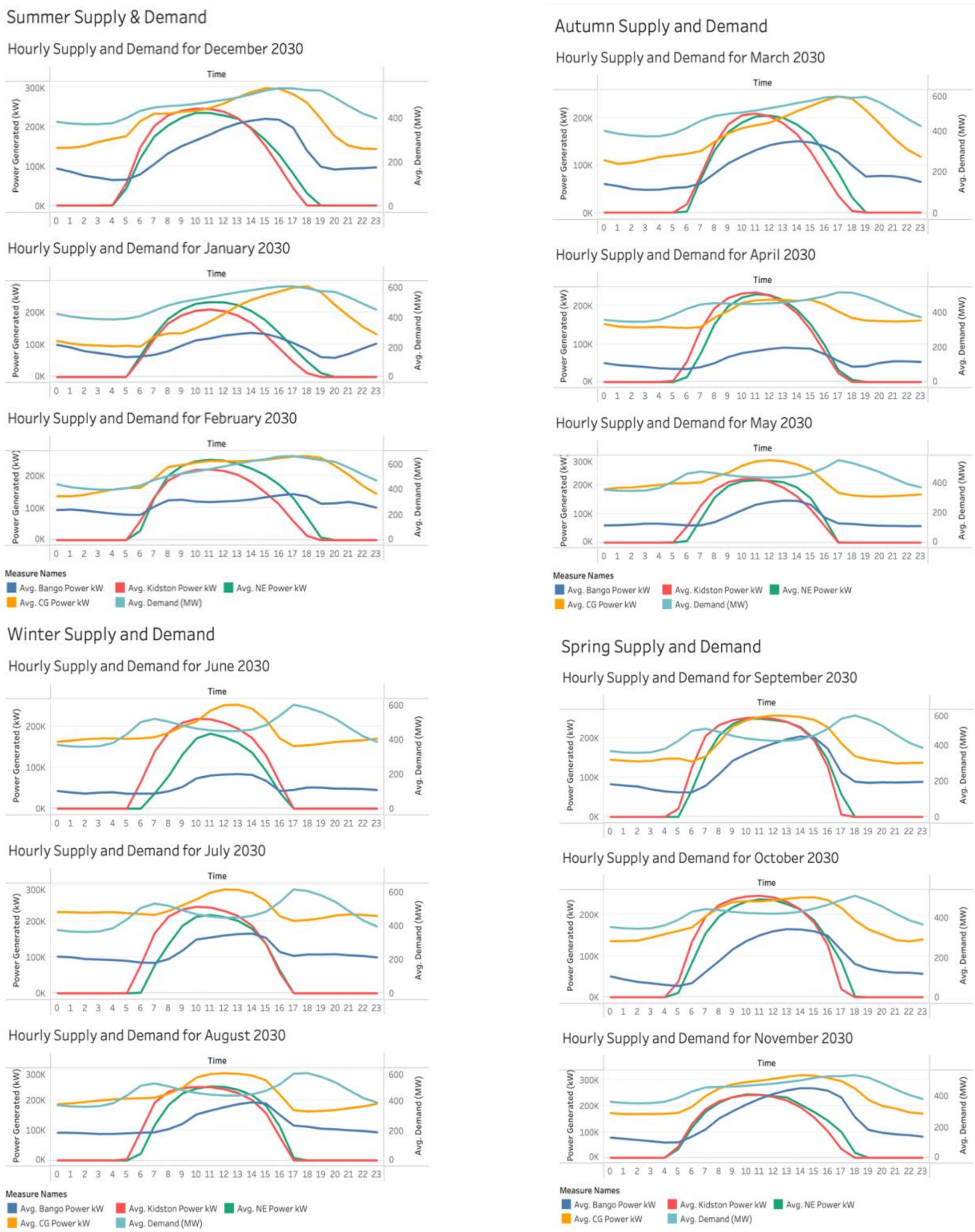

Figure 2 – Average Hourly Supply and Demand Curves for the DCI Proposal

ADVANTAGES OF DCI APPROACH

An advantage of DCI's approach is to use batteries to store excess energy generated by VRE to be used at a later time when there is insufficient generation due to peak demands or seasonal variability.

Furthermore, diversification of VRE sites also helps with energy security should one of the sites suffer a transmission problem, reduced solar irradiation or insufficient wind speeds.

TECHNICAL ERRORS

Unfortunately, assessing the system and sizing the energy storage based upon a monthly difference in demand vs supply does not provide sufficient granularity as to whether the battery would be sufficient for San Lucia's needs on an hourly basis.

Furthermore, the recommendations are based solely upon capacity factors of each site and do not take into account the levelized cost of energy (LCOE) or levelized cost of storage (LCOS).

WIND TURBINE SIZE

Another disadvantage with DCI's approach is their use of wind turbines with a nameplate capacity of 3800 kW. Although this was an impressive amount of generation a few years ago, technology has progressed and newer wind turbines such as the Wind to Energy w2e-171/8.0 are able to generate up to 8000 kW.

BATTERY LEVEL

To calculate the battery level of DCI's proposal throughout the year, Trusted Consulting summed the energy generated at each site and compared it to the forecasted demand curve on an hourly basis. The difference between supply and demand was calculated to indicate the spilled energy and unserved demand. The unserved demand was assumed to be met by the battery and any spilled energy was returned to the battery as long as it didn't exceed the battery's capacity. A snapshot of the results can be seen in Figure 3 when the battery drops to its lowest level in July of 3851 MWh or 1%.

BATTERY HEALTH

One of the technical implications of this approach to battery management is that it would accelerate battery degradation and rapidly shorten the life of the battery [2]. This is because lithium-ion batteries should be maintained between 20-80% of the maximum battery capacity to maximise the number of cycles they can achieve [3].

Figure 3 - Supply and Demand, Spilled Energy and Battery Level for July for DCI Proposal

EXISTING BATTERIES

When compared to existing BESS, the DCI proposal dwarfs existing batteries such as the Warratah SuperBattery [4] , which is the largest battery in Australia and has a nameplate capacity of 300MW with a 450 MWh capacity (1.5hr storage). The reason most utility scale batteries are not the size recommended by the DCI proposal is due to the levelized cost of storage for batteries.

ECONOMIC FEASIBILITY

The financial implication of the 257 000 MWh battery (684 MW) recommended by DCI is a massive capital expenditure (CAPEX) due to the levelized cost of storage in 2024 which is approximately $379 /kWh for a 48 hour battery [5, p. 75]. At 257 GWh, the cost of the battery in DCI’s proposal equates to $97B, making up the lion’s share of the total cost of DCI’s Proposal which is estimated at $101B.

TRUSTED PROPOSAL

ASSUMPTIONS

For Trusted Consulting's proposal, we assumed the following:

- Solar panels with a nameplate capacity of 350W and dual axis tracking, an efficiency of 18.4%, an area of 1.2m^2 and temperature coefficients of Alpha = 2.1e-7, Beta = 5.3e-3 and a Reference temperature = 25°C.[1]
- Wind turbines with a nameplate capacity of 8000 kW, a Cut-in wind speed of 3 m/s, a Cut-out wind speed of 25 m/s, a Hub Height of 160m, a Rotor length (diameter) of 171m and a power output curve of $\frac{8000}{1+e^{-k(v-v_0)}}$ where k = 0.65559 and v_0 = 8.684 as shown in Appendix A.

LEVELISED COST OF ENERGY

- The levelized costs of energy (LCOE) and levelized cost of storage (LCOS) from CSIRO's GenCost 2023-24 Draft Consultation [5] were considered reasonable figures to use for this modelling.

OPTION METHODOLOGY

To address the shortfalls in DCI's proposal, Trusted Consulting has taken the following considerations into account when modelling:

- Replaced the wind turbines modelled by DCI with the aforementioned Wind to Energy w2e-171/8.0.
- To ensure that there is sufficient granularity in the modelling, an iterative analysis was conducted with demand and supply curves for every hour of the year.
- For battery sizing, the capacity of the battery was maintained between 20-80% of its maximum capacity.

Table 2 – Summary of Options Evaluated by Trusted Consulting

	Kidston (MW)	New England (MW)	Bango (MW)	Coopers Gap (MW)	Battery Size (MWh)	PHES (MWh)	Total Cost ($m)
DCI	385	385	418	418	257000	0	101,066
Trusted 1	595	595	1200	1200	31250	0	20,829
Trusted 2	1225	0	0	2000	31250	0	19,681
Trusted 3	2870	0	0	3280	12500	0	20,455
Trusted 4	7000	0	0	7200	9375	0	36,413
Trusted 5	7000	7000	8000	8000	6250	0	71,875
Trusted 6	1505	1505	960	1760	11250	0	17,490
Trusted 7	6540	0	0	0	13099	0	15,835
Trusted 8	980	980	1008	1600	8750	2000	15,515

[1] These are the same figures as used by the DCI proposal.

OPTION ITERATIONS

TRUSTED PROPOSAL 1

For Trusted Consulting's first iteration, we reduced the battery size to 31250 MWh, (80% capacity = 25000 MWh), and increased the generation at each site until the lowest battery capacity throughout the year was no lower than 20%. This required 1.7 million solar panels at each solar farm and 150 wind turbines at each wind farm. This change reduced the total cost of the system by 80% to $20,828 million.

TRUSTED PROPOSAL 2

For the next iteration, we kept the battery size the same but checked whether using only the wind and solar sites with the highest capacity factor would make a difference. This configuration involved 3.5 million solar panels at Kidston and 250 wind turbines at Coopers Gap, which resulted in only a slight cost reduction to $19,681 million.

TRUSTED PROPOSAL 3

For the third iteration, we reduced the battery size to 12500 MWh, (80% capacity = 10000 MWh), and increased the generation at each site until the lowest battery capacity throughout the year was no lower than 20%. Although the cost of the battery had decreased again, the cost of 8.2 million solar panels at Kidston and 450 wind turbines at Coopers Gap offset any decrease achieved. The total cost of the system was estimated at $20,455 million.

TRUSTED PROPOSAL 4

We tried reducing the battery size even further to 9375 MWh, (80% capacity = 7500 MWh). However, with only Kidston and Coopers Gap operational, the lowest battery capacity throughout the year could not be raised above 15% no matter how much generation was installed.

TRUSTED PROPOSAL 5

To see if there was a lower limit for battery size, we reduced the battery size to 6250 MWh (80% capacity = 5000 MWh). At this battery capacity, the battery capacity was reduced to zero at some point in the year no matter how much solar or wind generation was installed.

TRUSTED PROPOSAL 6

Implementing the lessons from the previous iterations, we reverted to a battery size of 11250 MWh (80% capacity = 9000 MWh). We also chose to install 120 wind turbines at Bango and 220 wind turbines at Coopers Gap as well as 4.3 million solar panels at Kidston and 4.3 million solar panels at New England. This led to a total cost of $17490m.

TRUSTED PROPOSAL 7

Although the cost of proposal 6 was 83% less than DCI's proposal, Trusted Consulting decided to conduct a cross-check to see what the optimising function called 'Data Solver' in Microsoft Excel could achieve. By allowing the algorithm to try all the possible combinations of generation and battery size, it arrived at a solution where there was a substantially larger solar farm at Kidston (18.7 million solar panels for 6540 MW) and a battery size of 13099 MWh. This led to a total cost of $15835m. However, with such a concentrated energy generation portfolio, this approach is not recommended. If there were long periods of cloud cover or should a transmission line go down, there would be no power available for supply at all.

TRUSTED PROPOSAL 8

For the final iteration, Trusted Consulting considered the installation of a Pumped Hydro Energy Storage system co-located at Kidston. For modelling purposes, it was assumed that the PHES was the same size as the Kidston Pumped Storage Hydro Project in Australia [6] with 250 MW and 8 hours of storage at 2000 MWh.

Since a PHES was installed, the battery size was able to be reduced to 8750 MWh (80% capacity = 7000 MWh), while the solar generation was diversified across Kidston (2.8 million solar panels for 980 MW) & New England (2.8 million solar panels for 980 MW). Wind turbines were diversified across Bango (126 wind turbines for 960 MW) and Coopers Gap (200 wind turbines for 1600 MW) but with a bias for Coopers Gap which had a higher capacity factor than Bango. This led to a total cost for the system of $15319m.

SUMMARY OF TRUSTED PROPOSAL 8

Below is a summary of Trusted Consulting's Proposal 8, which is considered to be the most cost-effective solution for transitioning San Lucia City Council to a 100% renewable energy system. Supply and demand curves for the first week of January for Trusted Proposal 8 are shown on the next page, while the supply and demand curves for each month can be found in Appendix B.

Table 3 – Generation and Storage Details

	Kidston	New England	Bango	Coopers Gap	PHES	Battery
Solar Panel (W)	350	350				
# Solar Panels	2.8m	2.8m				
Wind Turbine (kW)			8000	8000		
# Wind Turbines			126	200		
Nameplate Capacity (MW)	980	980	1008	1600	250	475
Storage Capacity (MWh)					2000	8750
Capacity Factor (%)	22	21	19	41		
LCOE ($/kW)	1500	1500	3000	3000		
LCOS ($/kWh)					363	460
Cost ($m)	1470	1470	3024	4800	726	4025

System Power
4568 MW

System Nameplate Capacity
40,016 GWh

System Storage
10,750 MWh

Spilled Energy (2030)
7112 GWh

System Cost
$15,515m

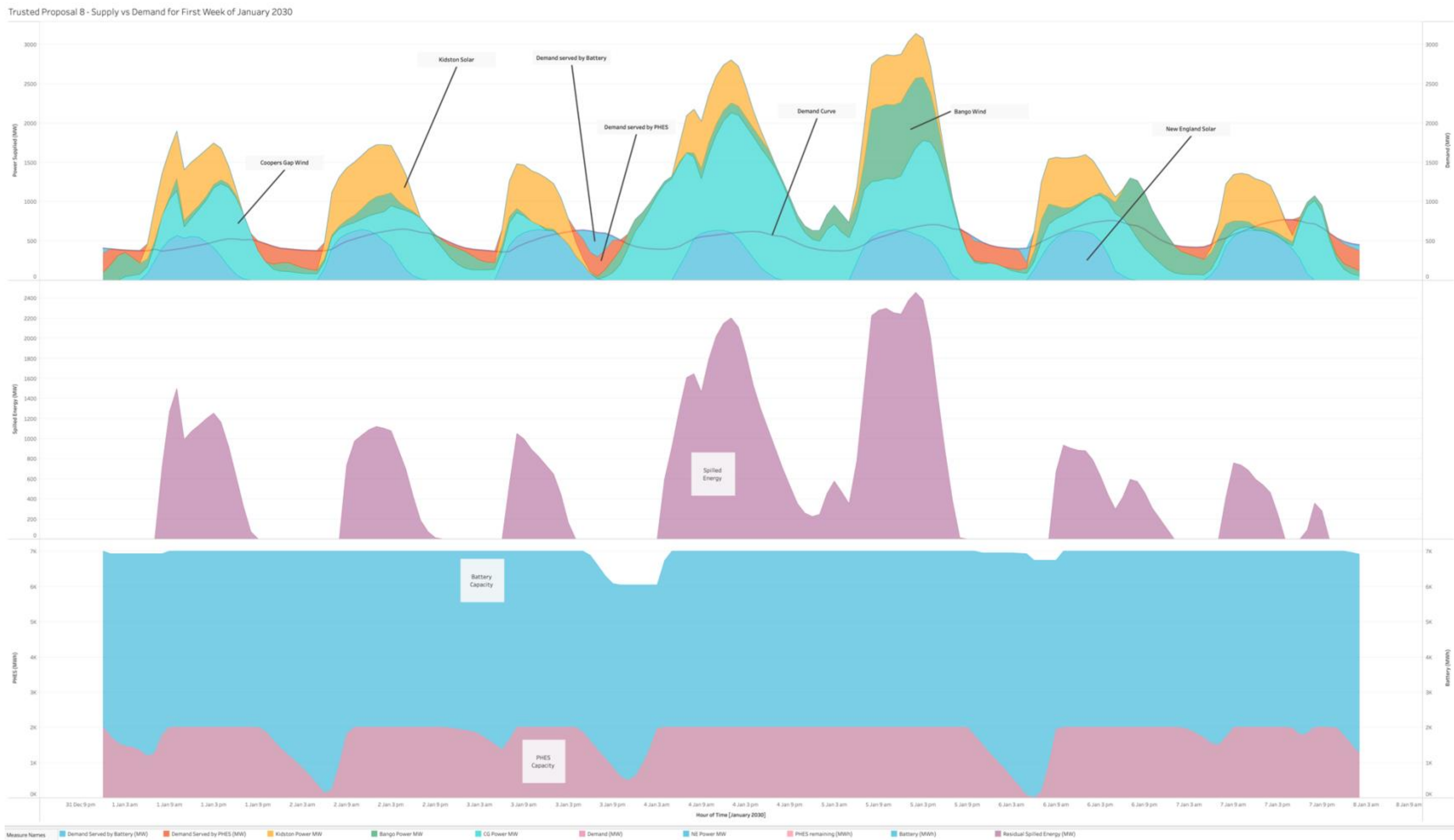

Figure 4 – Supply and Demand Curves for the First Week of January 2030 for Trusted Proposal 8

TECHNICAL DISCUSSION

The configuration of Trusted Proposal 8 is in line with the latest research and analysis by organisations such as the CSIRO in Australia. For example, in their latest Gencost 2023-24 Consultation draft [5, p. 64], they state that:

> **In a high variable renewable system, maximum demand will be significantly lower than the capacity of variable renewables installed.**

10:1

VRE Installed vs Maximum Demand

For Trusted Proposal 8, the VRE generation proposed exceeds the maximum demand by a factor of 10:1. Although this is considerably more than the ratio recommended by CSIRO, this difference is understandable since CSIRO modelling only accounts for an extreme case of 90% VRE as opposed to the 100% VRE commitment made by San Lucia. Diversification across all four sites also helps with ensuring energy security and accounts for any daily or seasonal differences between sites. However, there is a bias towards Coopers Gap due to its higher capacity factor which is almost double that of every other site.

Due to the high LCOS compared to LCOE of VRE, it is more affordable for San Lucia to have excess spilled energy than to have a large storage capacity. It should also be noted that Trusted Proposal 8 has been sized so that the battery is maintained between 20-80% so as to extend battery life. Even with the a relatively small storage capacity (8750 MWh) supplemented by PHES (2000 MWh), the cost of the battery is still 25.9% of the total cost of the system

MARKET DYNAMICS

Although the technical analysis of Trusted Proposal 8 shows that 100% VRE with zero unserved demand is feasible, it is only economically feasible if managed from a whole-of-system framework. As shown in the analysis, there is an estimated 7112 GWh of spilled energy that would need to be curtailed. Since curtailment of generation reduces a site's Return on Investment (ROI), wind and solar farm operators may choose to only install sufficient VRE generation to avoid curtailment. This would cause flow-on effects with unserved demand and blackouts.

ECONOMIC OPPORTUNITIES

As long as San Lucia City Council employs a more centralized planning approach to building out VRE generation and storage, there will be a forecasted 7112 GWh of spilled energy in 2030. However, instead of curtailing this energy, San Lucia should encourage the predominant local sectors such as heavy industy, agriculture, truck and rail corridor to start or modify their businesses to maximise the low cost energy. Additional consultation with industry stakeholders is therefore recommended to ascertain the level of interest for the creation of Renewable Energy Zones to promote flexible demand, zero carbon heat and green hydrogen/ammonia.For example, heavy industry could use thermal batteries to store heat for later use, agricultural companies could curtail their operations to reduce demand or truck and rail companies could use the excess energy to generate green hydrogen or green ammonia to refuel their vehicles as they pass through San Lucia.

Green ammonia production could also be used for ammonia-fired power generation such as the one announced by Centrica and Mitsubishi Europe in Ireland [7] to firm up energy security in San Lucia or open up export channels for green fuels to countries with low renewable energy resources such as Asia or the shipping industry [8].

ENVIRONMENTAL IMPACTS

Aside from the technical and economic implications of Trusted Proposal 8, there are environmental considerations that will need to be assessed for each site.

With 2.8 million solar panels at Kidston and 2.8 million panels at New England will require 4 square kilometres for each site. The development proposal will need to ensure that there are no impacts on the local flora or fauna.

For the wind farm sites at Bango and Coopers Gap, the wind turbines selected by Trusted Consulting have a hub height of 160 m and a rotor diameter of 171 m. With an operating wind speed range of 3-25 m/s, the development proposal will need to ensure that flora or fauna (especially birdlife) are harmed.

Although the energy generated by wind turbines, solar panels and batteries outweigh the embodied carbon when compared to fossil fuel generators [9], recycling and waste management of these components will be a considerable issue once they reach their end of life due to the concrete, steel, copper, rare earth metals and aluminium used in these items [10].

SOCIAL LICENSE

Another major issue to be addressed on San Lucia's journey to 100% VRE is social license. To avoid NIMBYism (the common sentiment of Not In My Back Yard), engagement with the local community should be started early to ensure that their concerns are addressed and fair compensation is awarded to land owners [11].

CONCLUSION

To conclude this report, it is Trusted Consulting's opinion that San Lucia City Council should reject Dodgy Consultant Incorporated's proposal as the cost of the system is estimated at $101 billion due to the over-reliance on battery storage to meet peak demand and account for seasonal variability.

RECOMMENDATIONS

Instead of focusing on battery storage, Trusted Consulting recommends that San Lucia City Council adopt the following measures:

1. Take a centralized approach towards building out variable renewable energy and storage as part of its commitment to transition to 100% VRE to avoid issues with private solar and wind farm operators installing insufficient generation due to the risk of curtailment.
2. Install 4568 MW of VRE with an annual nameplate capacity of 40,016 GWh and 10750 MWh of energy storage for a total cost of $15,515 million. This includes:
    a. 2.8 million solar panels with dual axis tracking at Kidston for a nameplate capacity of 980 MW at an estimated cost of $1470 million.
    b. 2.8 million solar panels with dual axis tracking at New England for a nameplate capacity of 980 MW at an estimate cost off $1470 million.
    c. 126 wind turbines (8000 kW) at Bango for a nameplate capacity of 1008 MW at an estimated cost of $3024 million.
    d. 200 wind turbines (8000 kW) at Coopers Gap for a nameplate capacity of 1600 MW at an estimated cost of $4800 million.
    e. a 250 MW Pumped Hydro Energy Storage system (2000 MWh storage) at Kidston for an estimated cost of $726 million.
    f. a 475 MW Battery Energy Storage system (8750 MWh storage) for an estimated cost of $4025 million.
3. Engage with the local community early to ensure all stakeholder's concerns are met.
4. Conduct environmental studies to ensure that the aforementioned plans at each site will not negatively impact native flora, fauna and ecosystems.
5. Conduct additional consultation with industry for expressions of interest in Renewable Energy Zones to fully utilise spilled energy instead of curtailing it through strategies such as flexible demand, thermal storage and green hydrogen/ammonia production.

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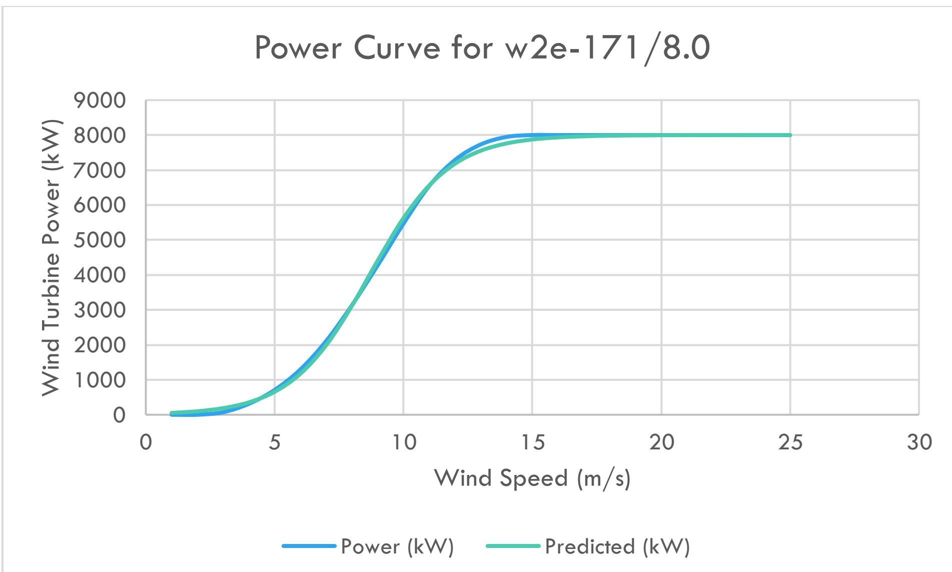
APPENDICES

APPENDIX A – W2E-171/8.0

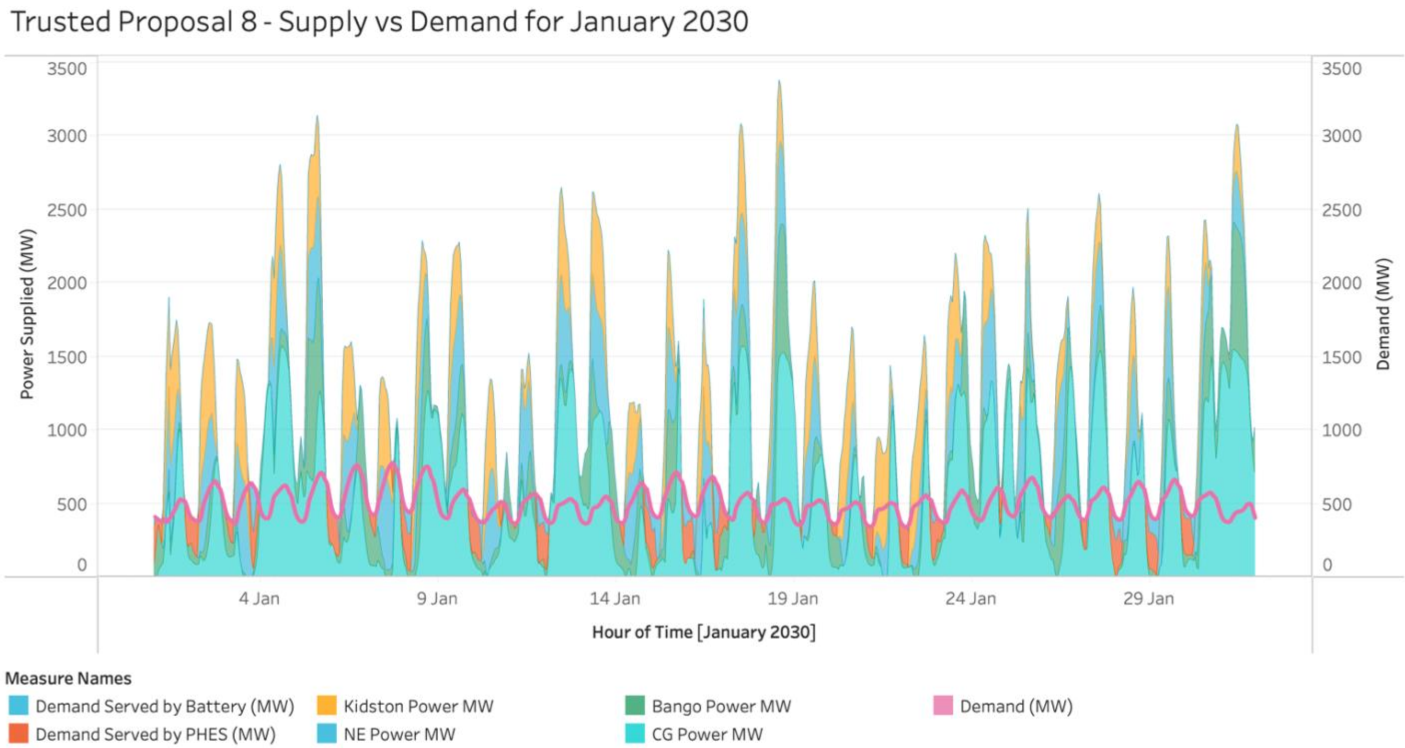
The power curve for the Wind to Energy w2e-171/8.0 wind turbine was calculated using Microsoft Excel' Data Solver function with the resulting equation being:

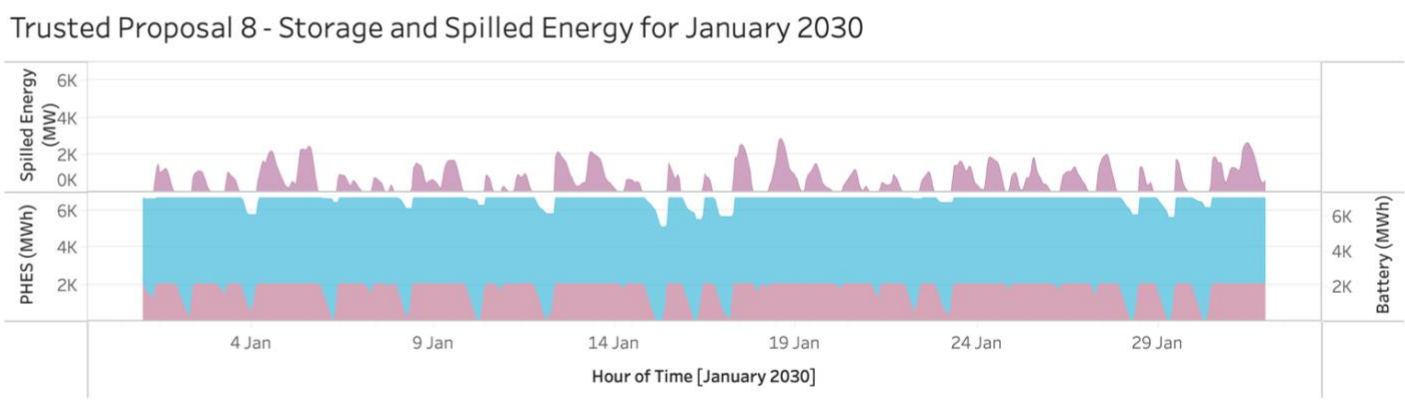
$$\frac{8000}{1 + e^{-k(v - v_0)}}$$

Where k = 0.65559 and v_0 = 8.684

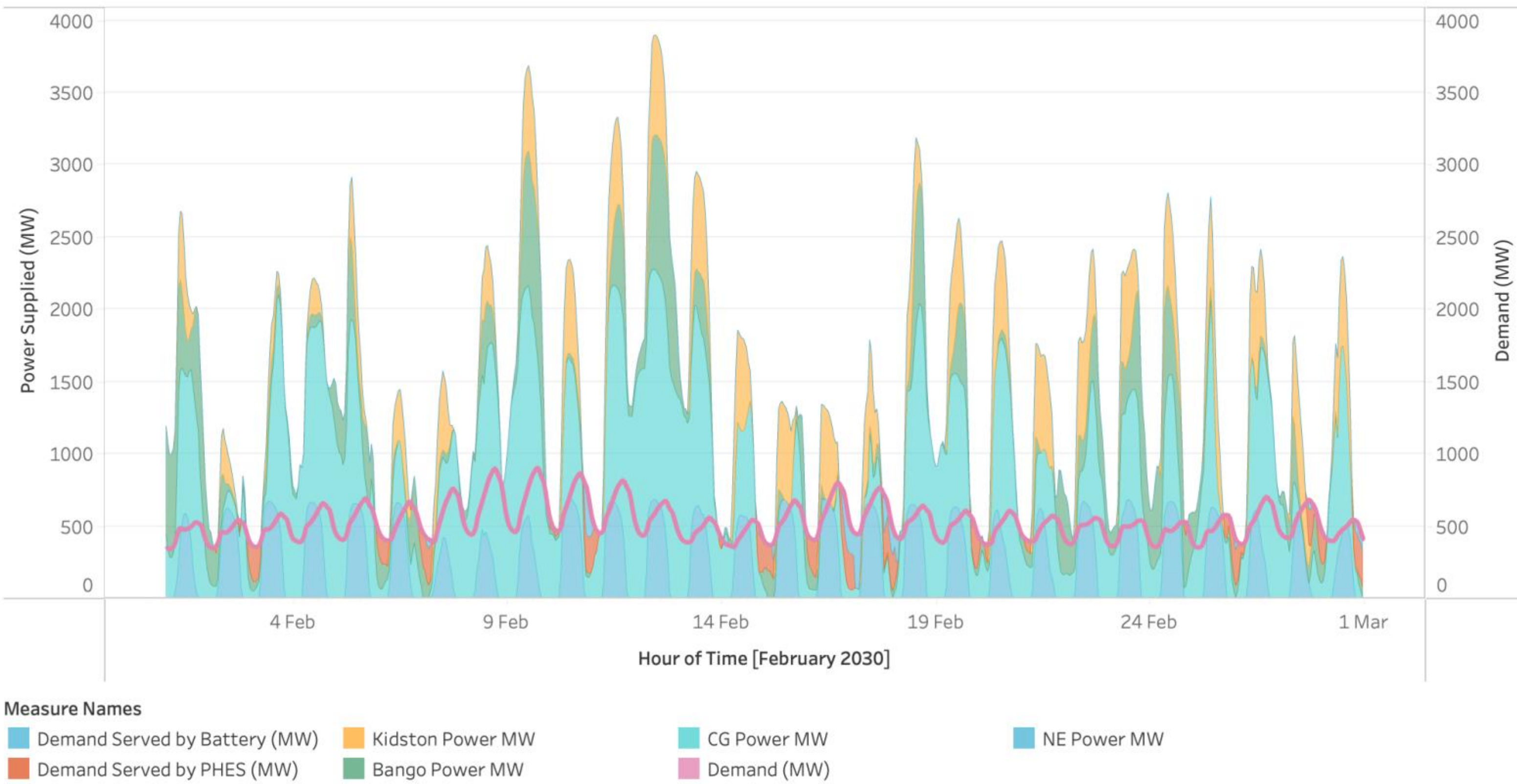


APPENDIX B - TRUSTED PROPOSAL 8

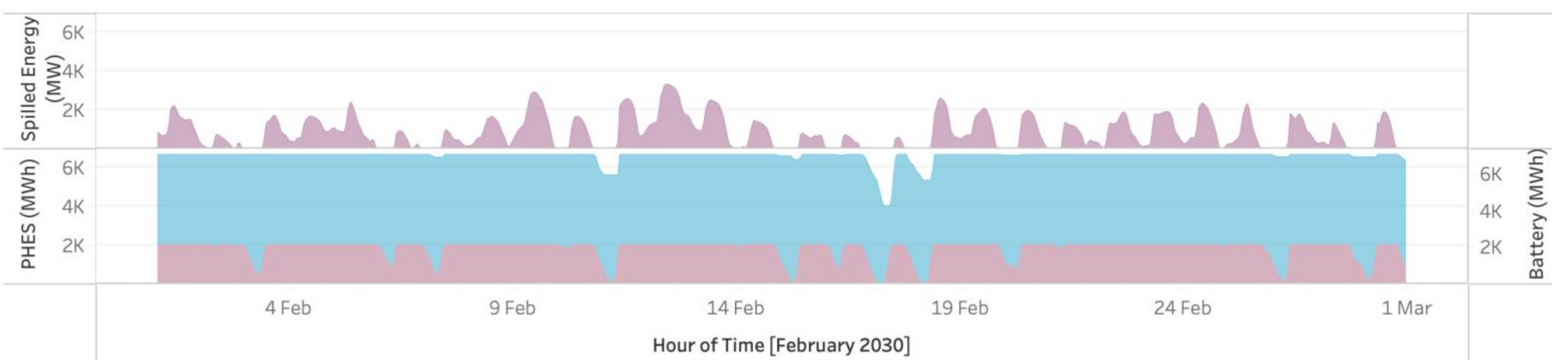




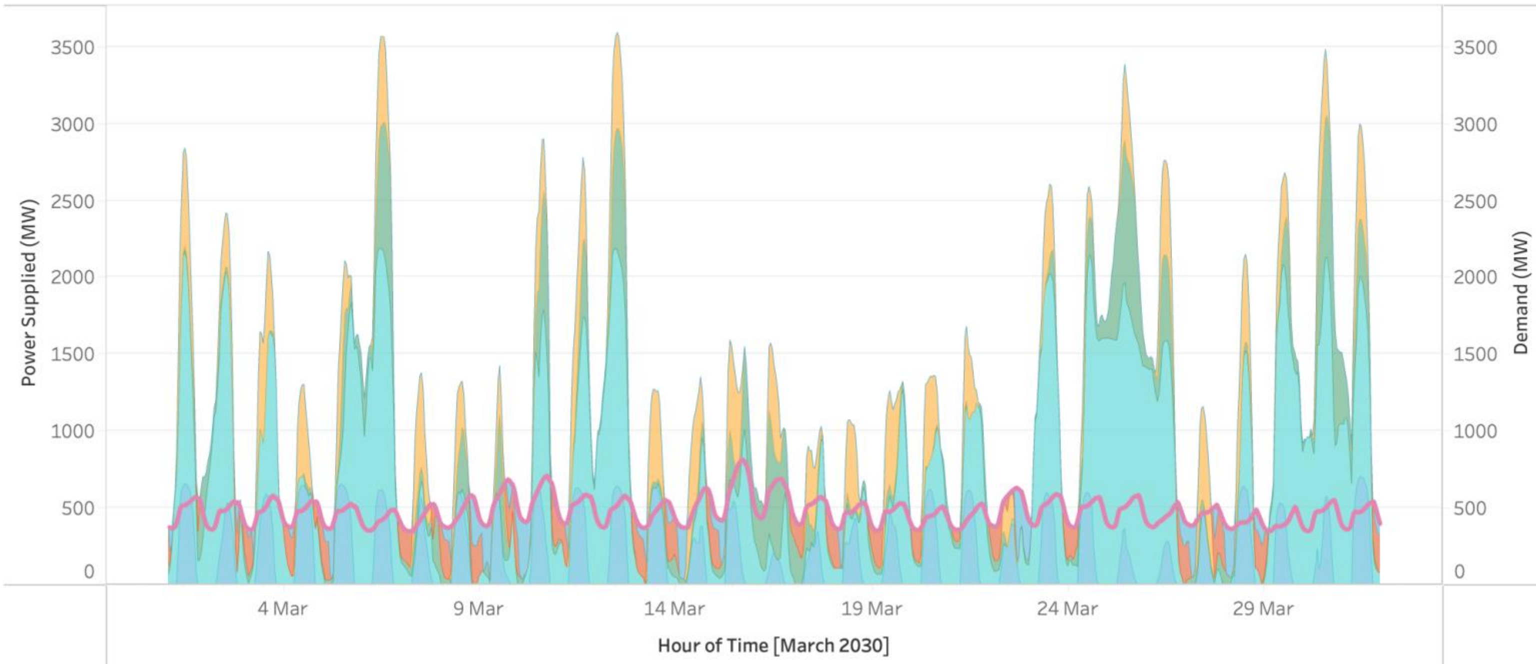
Trusted Proposal 8 - Supply vs Demand for February 2030



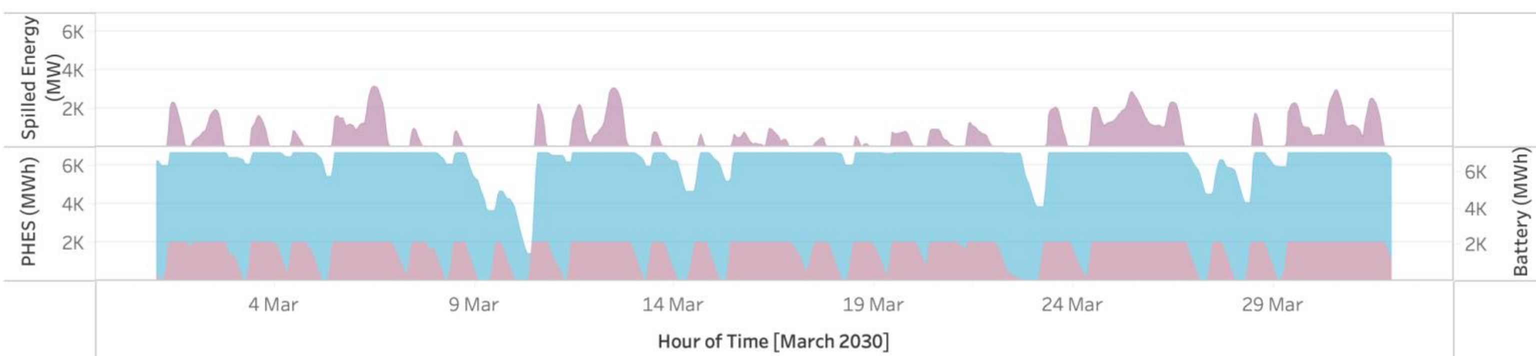
Trusted Proposal 8 - Storage and Spilled Energy for February 2030



Trusted Proposal 8 - Supply vs Demand for March 2030

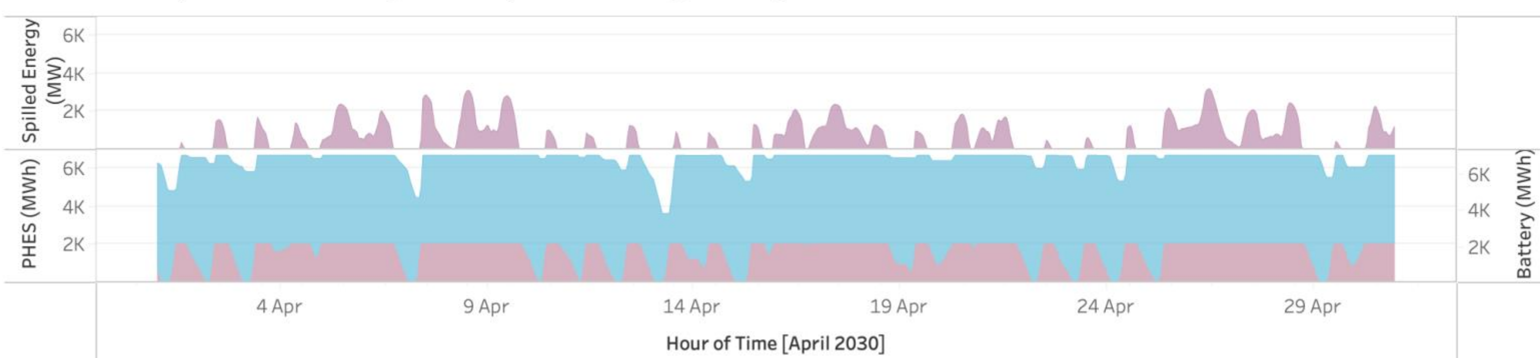


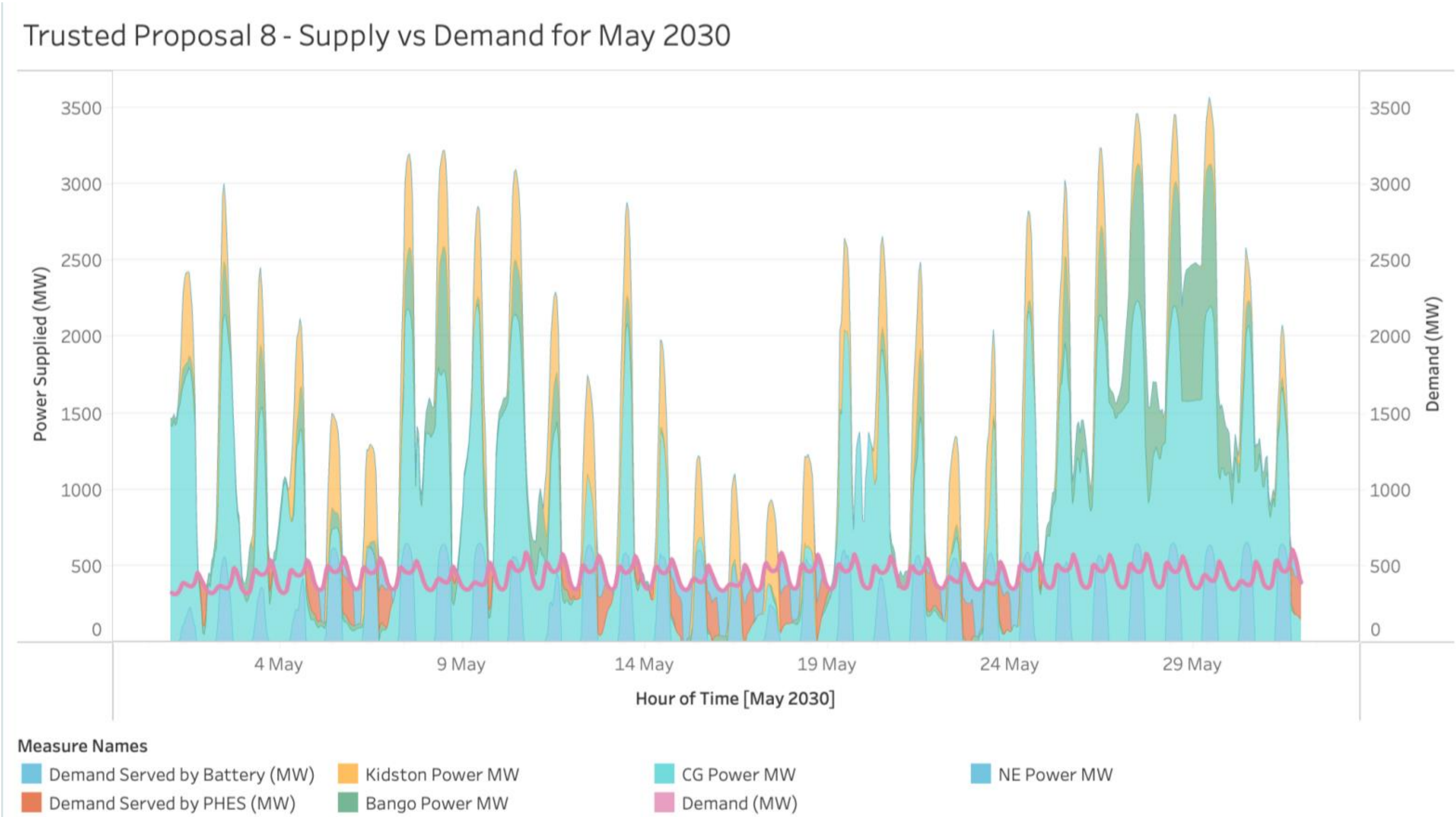
Trusted Proposal 8 - Storage and Spilled Energy for March 2030

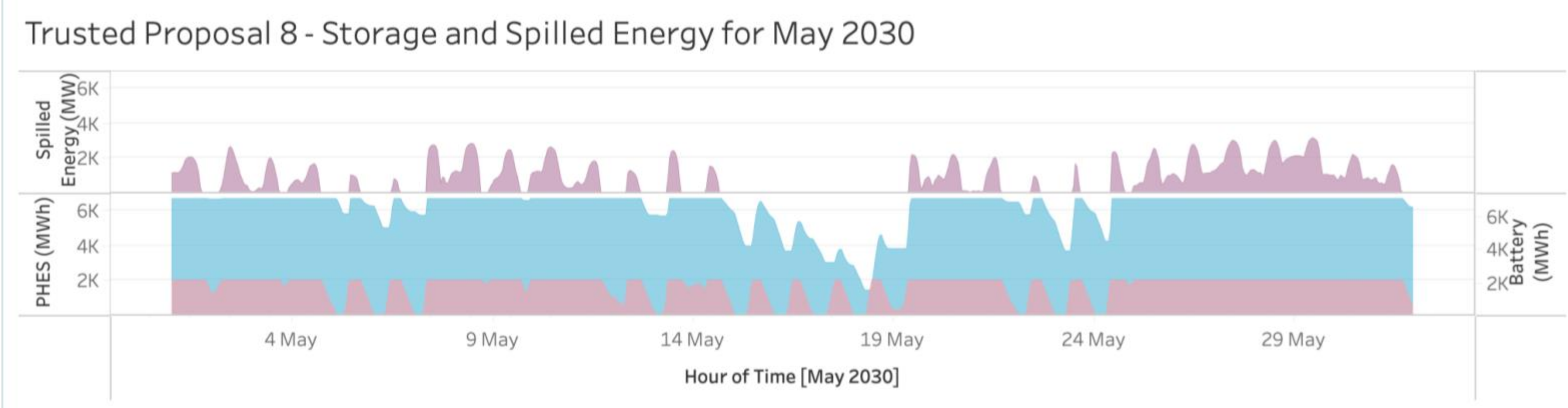


Trusted Proposal 8 - Supply vs Demand for April 2030

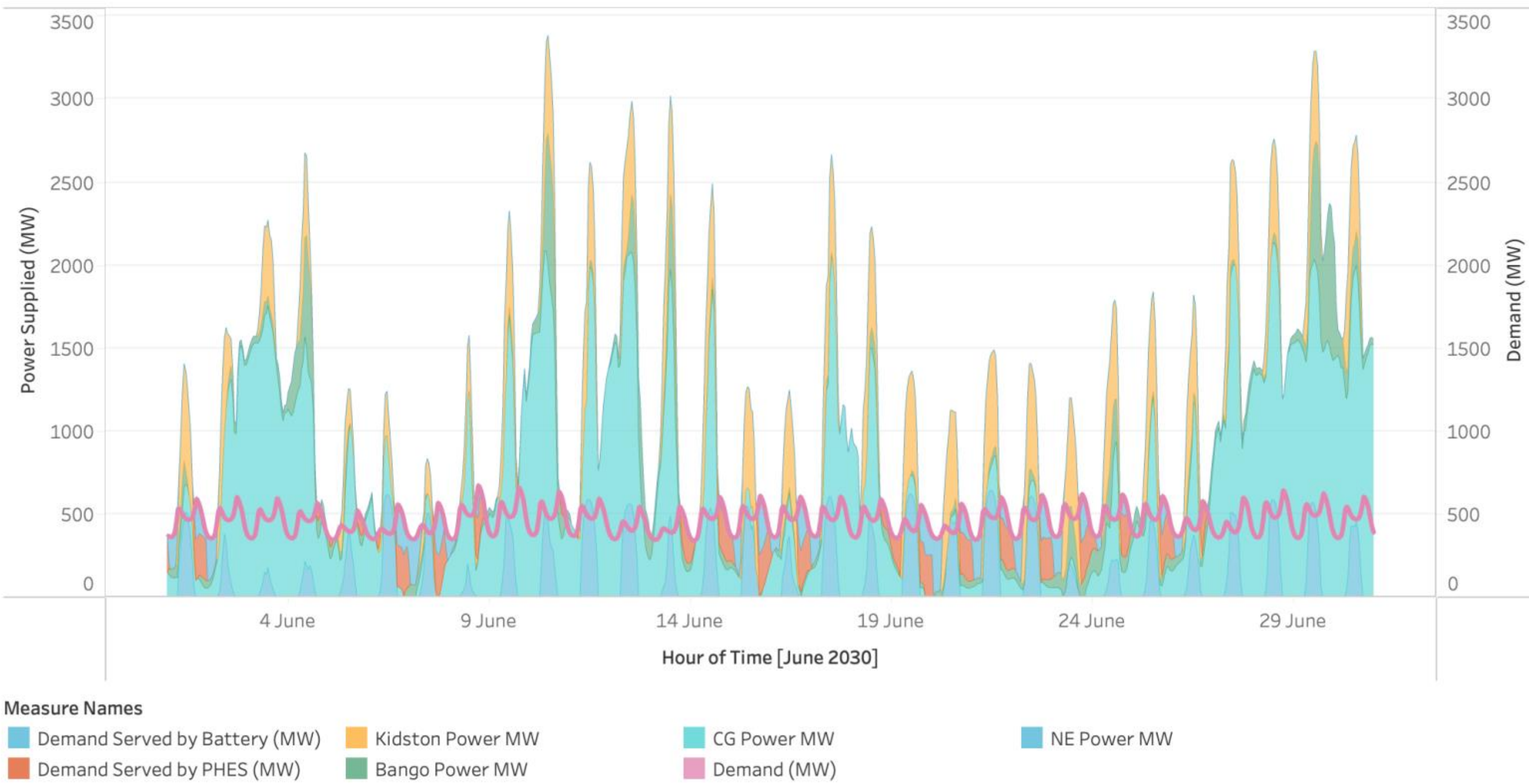
Trusted Proposal 8 - Storage and Spilled Energy for April 2030



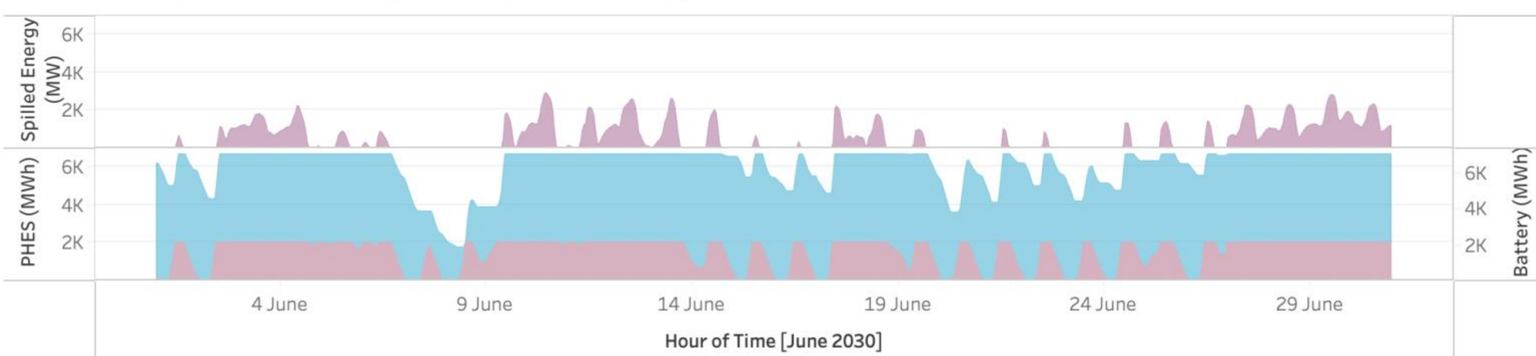

Trusted Proposal 8 - Supply vs Demand for May 2030
Power Supplied (MW)
Demand (MW)
3500
3000
2500
2000
1500
1000
500
0
4 May
9 May
14 May
19 May
24 May
29 May
Hour of Time [May 2030]
Measure Names
Demand Served by Battery (MW)
Demand Served by PHES (MW)
Kidston Power MW
Bango Power MW
CG Power MW
Demand (MW)
NE Power MW

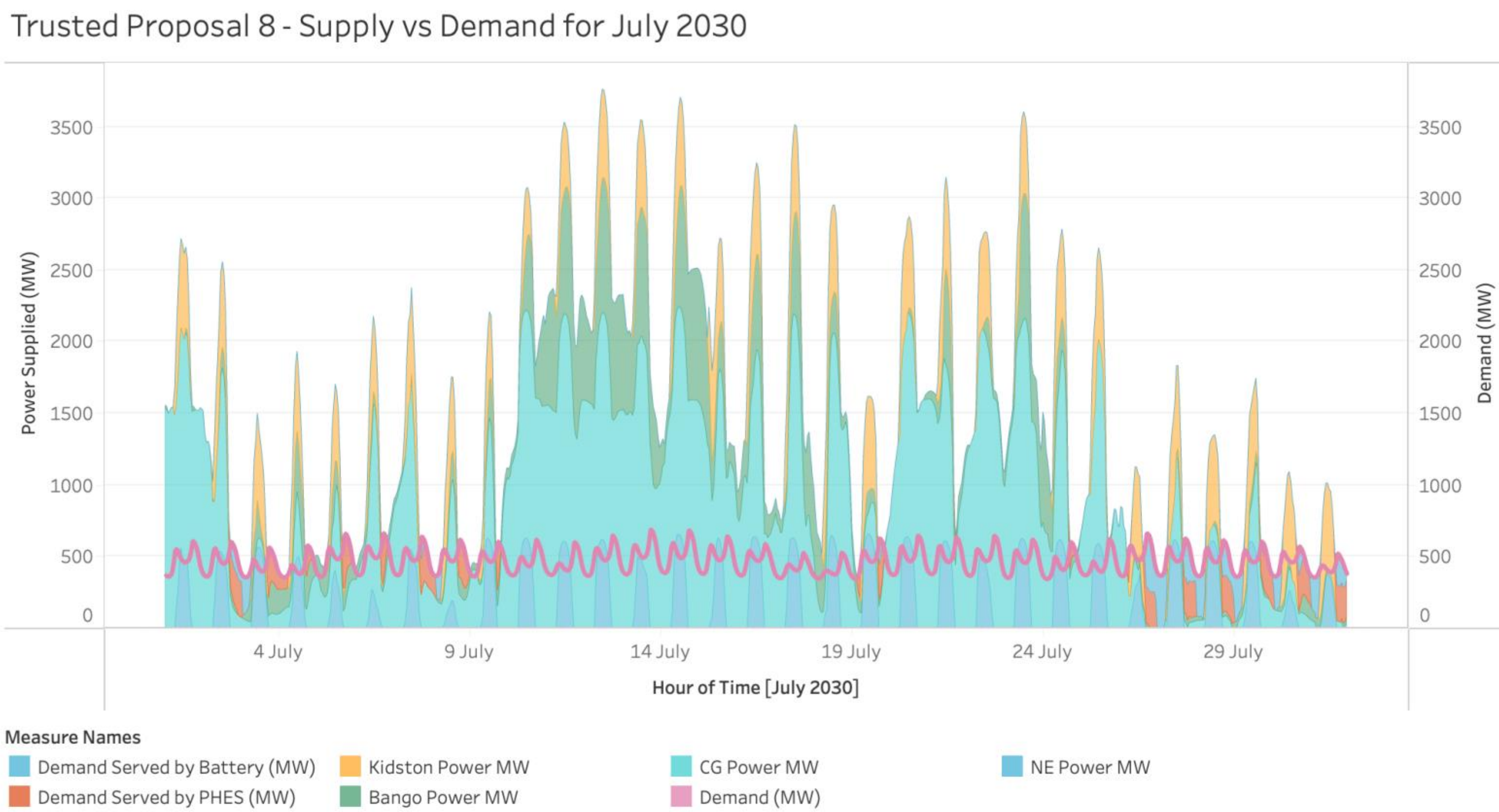

Trusted Proposal 8 - Storage and Spilled Energy for May 2030
Spilled Energy (MW)
6K
4K
2K
PHES (MWh)
Battery (MWh)
4 May
9 May
14 May
19 May
24 May
29 May
Hour of Time [May 2030]

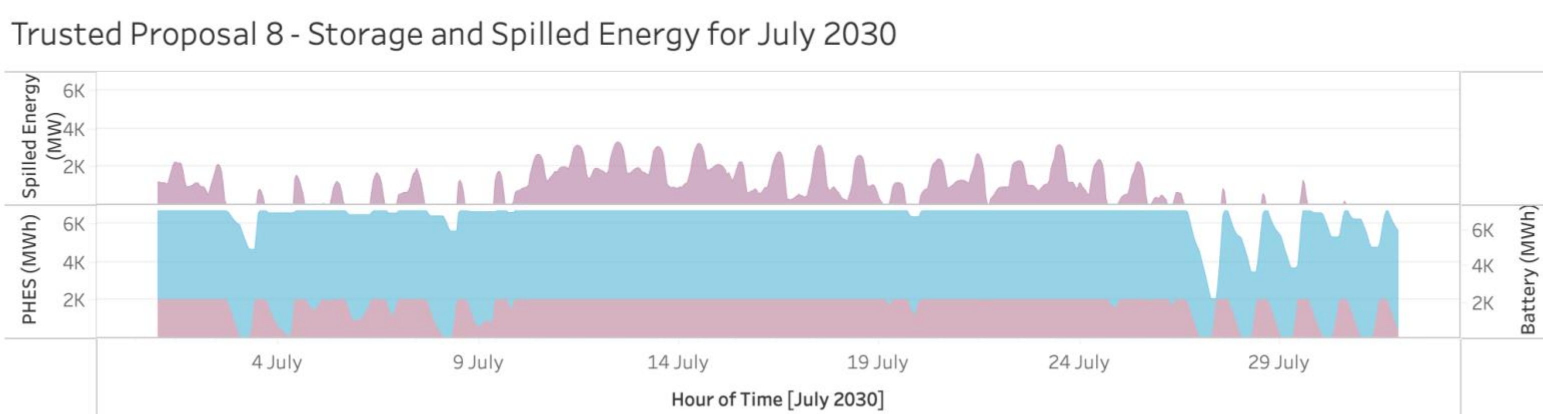
Trusted Proposal 8 - Supply vs Demand for June 2030



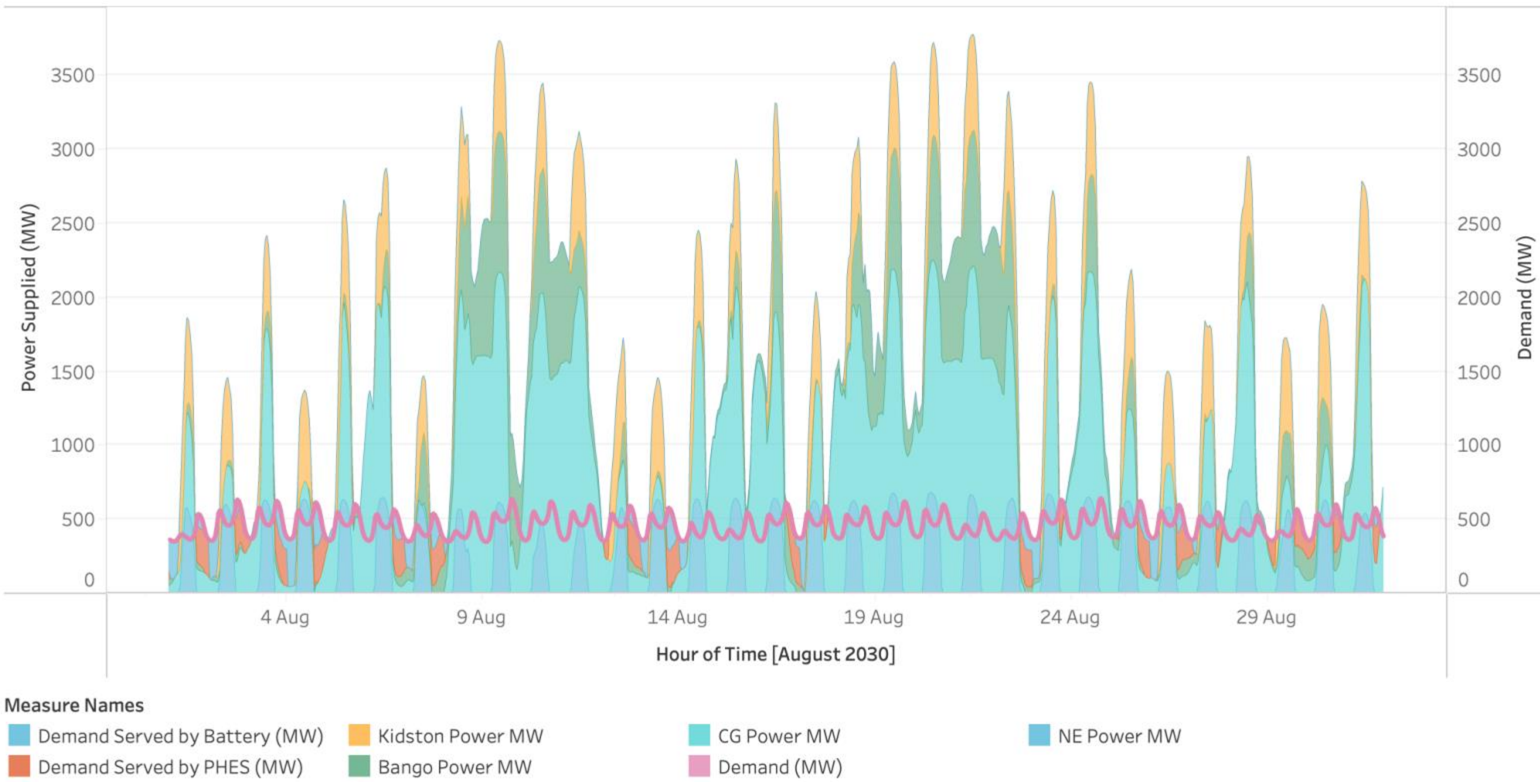
Trusted Proposal 8 - Storage and Spilled Energy for June 2030



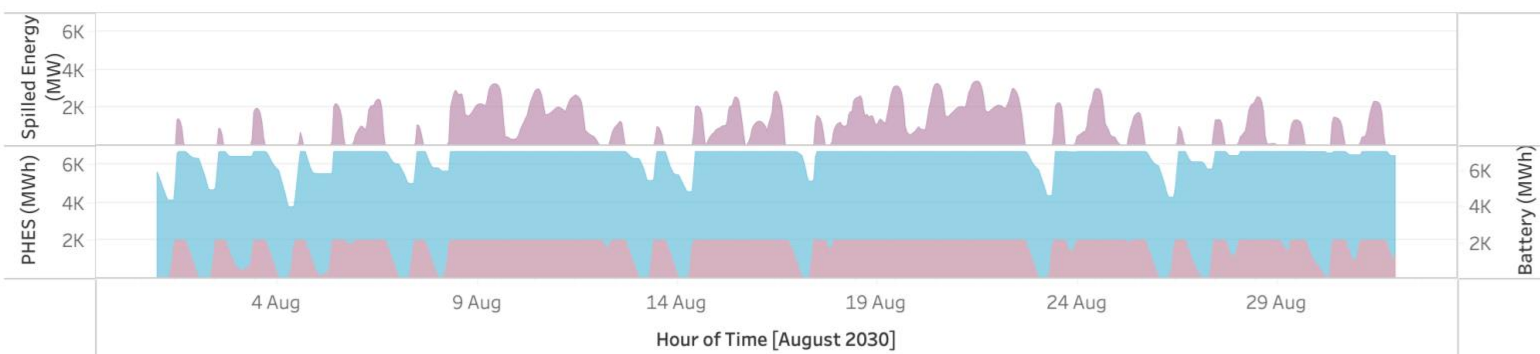

Trusted Proposal 8 - Supply vs Demand for July 2030
Power Supplied (MW)
Demand (MW)
3500
3000
2500
2000
1500
1000
500
0
4 July
9 July
14 July
19 July
24 July
29 July
Hour of Time [July 2030]
Measure Names
Demand Served by Battery (MW)
Demand Served by PHES (MW)
Kidston Power MW
Bango Power MW
CG Power MW
Demand (MW)
NE Power MW

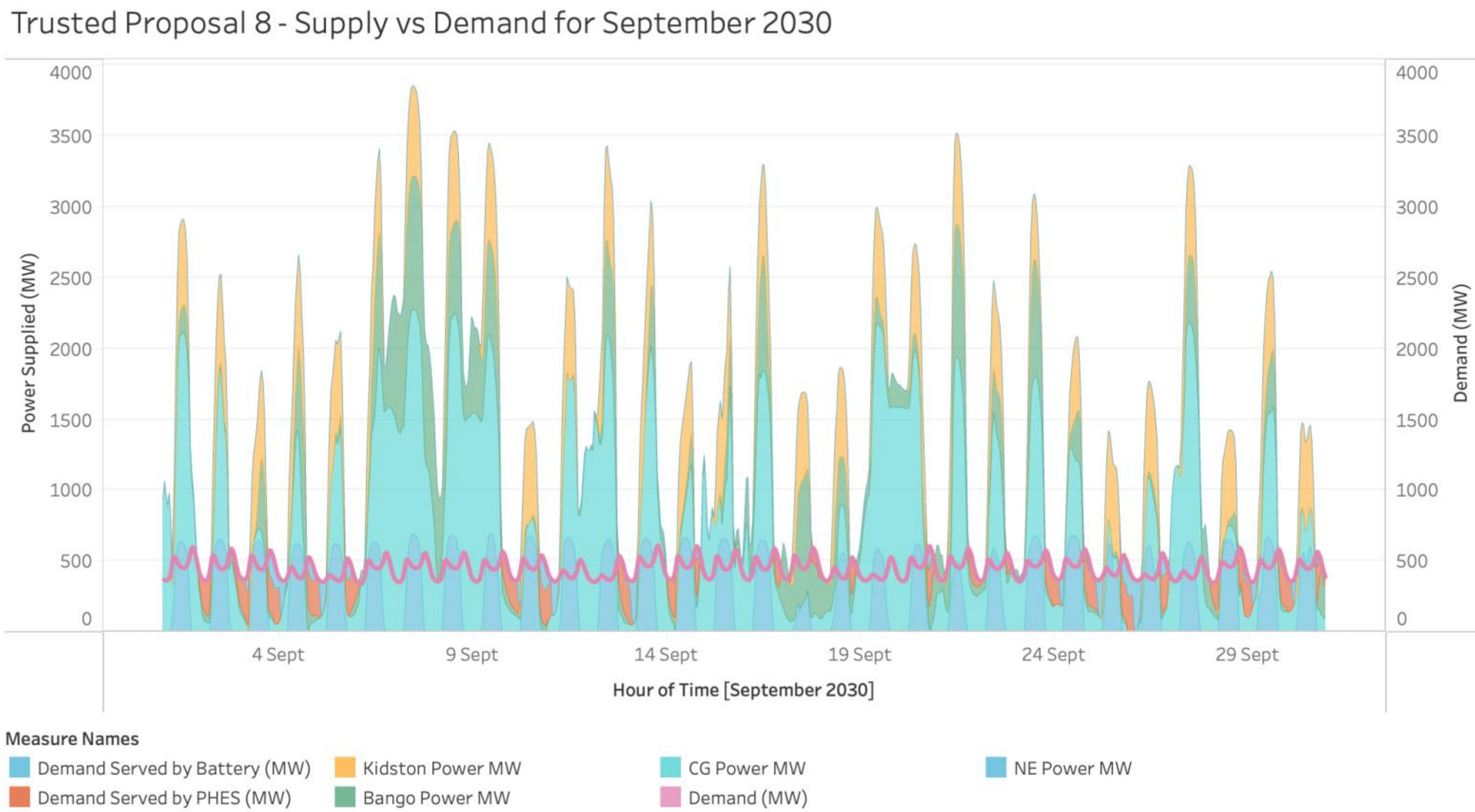

Trusted Proposal 8 - Storage and Spilled Energy for July 2030
Spilled Energy (MW)
PHES (MWh)
Battery (MWh)
6K
4K
2K
4 July
9 July
14 July
19 July
24 July
29 July
Hour of Time [July 2030]

Trusted Proposal 8 - Supply vs Demand for August 2030

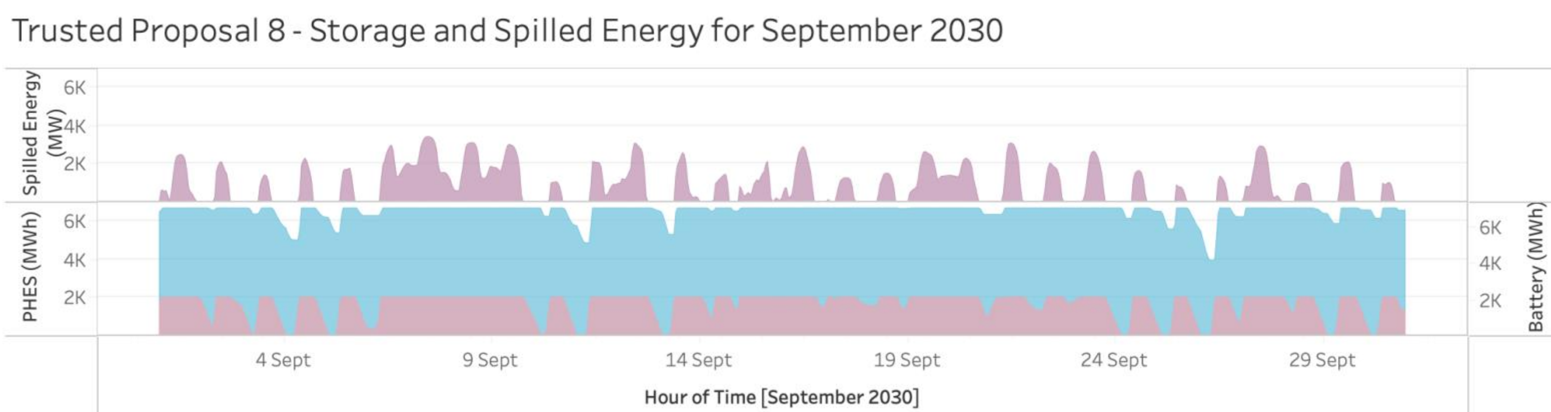


Trusted Proposal 8 - Storage and Spilled Energy for August 2030

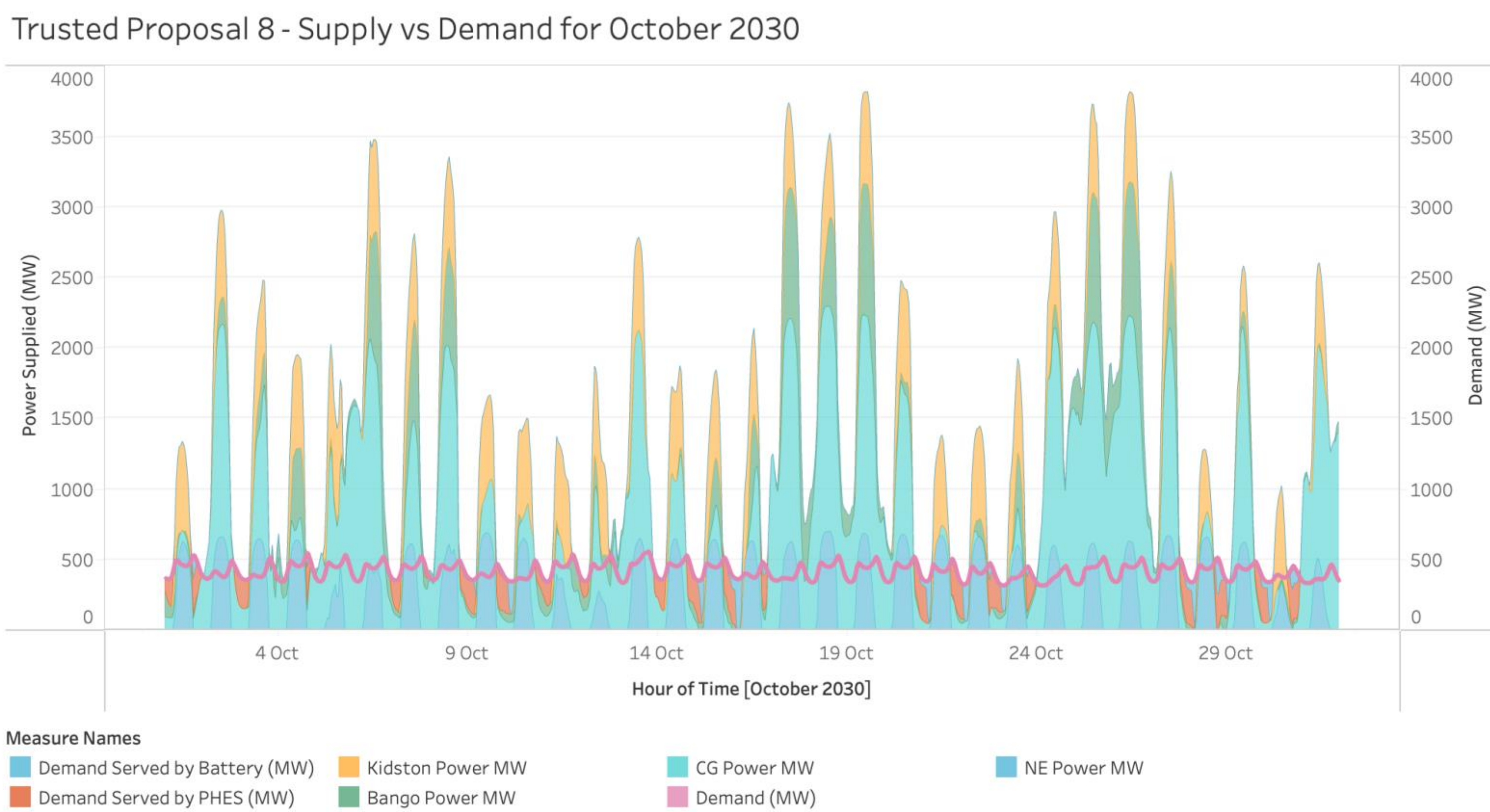


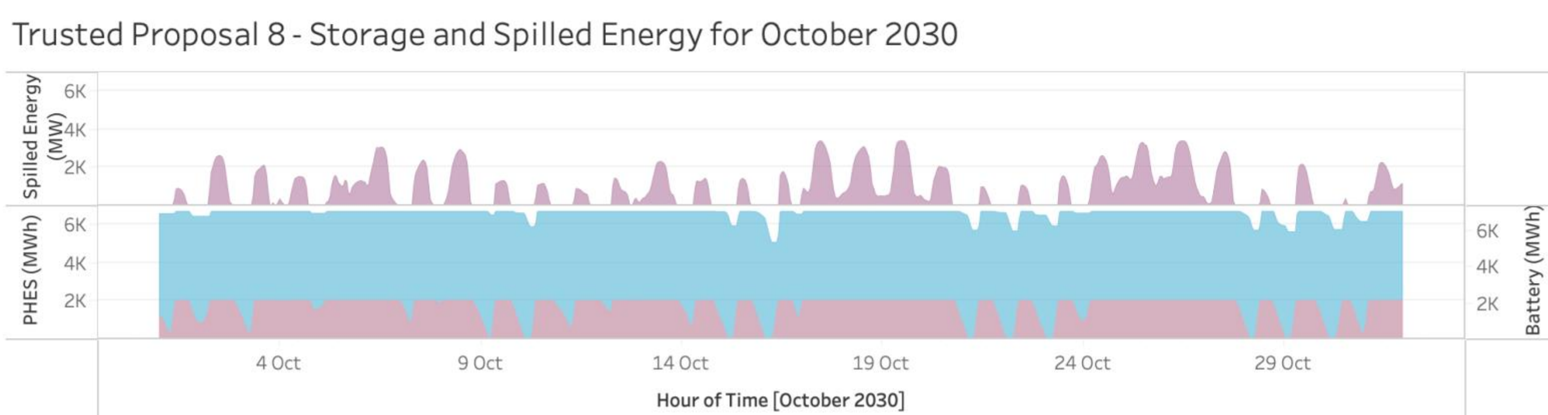


Trusted Proposal 8 - Supply vs Demand for September 2030
Power Supplied (MW)
Demand (MW)
4000
3500
3000
2500
2000
1500
1000
500
0
4 Sept
9 Sept
14 Sept
19 Sept
24 Sept
29 Sept
Hour of Time [September 2030]
Measure Names
Demand Served by Battery (MW)
Demand Served by PHES (MW)
Kidston Power MW
Bango Power MW
CG Power MW
Demand (MW)
NE Power MW

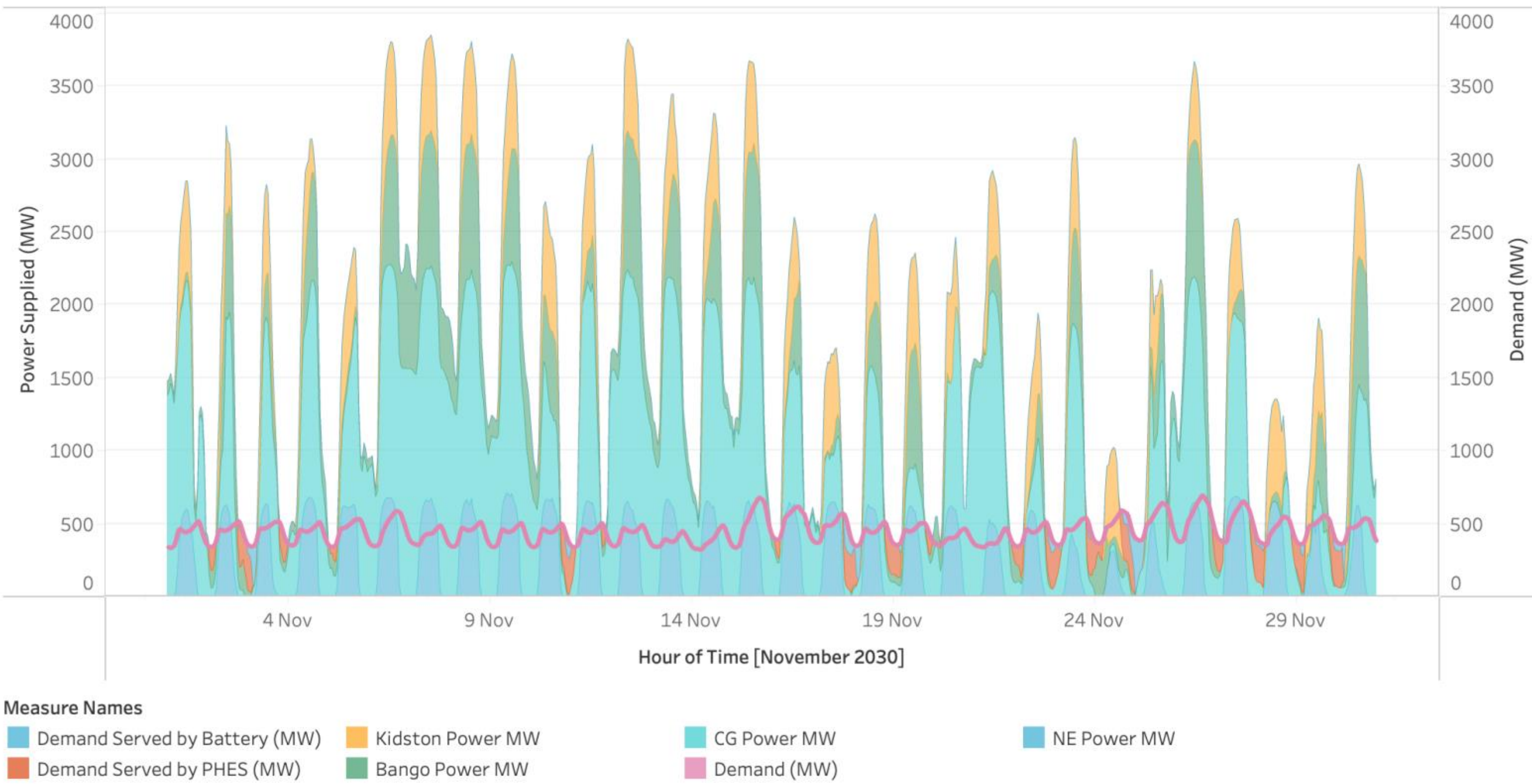


Trusted Proposal 8 - Storage and Spilled Energy for September 2030
Spilled Energy (MW)
6K
4K
2K
PHES (MWh)
Battery (MWh)
4 Sept
9 Sept
14 Sept
19 Sept
24 Sept
29 Sept
Hour of Time [September 2030]

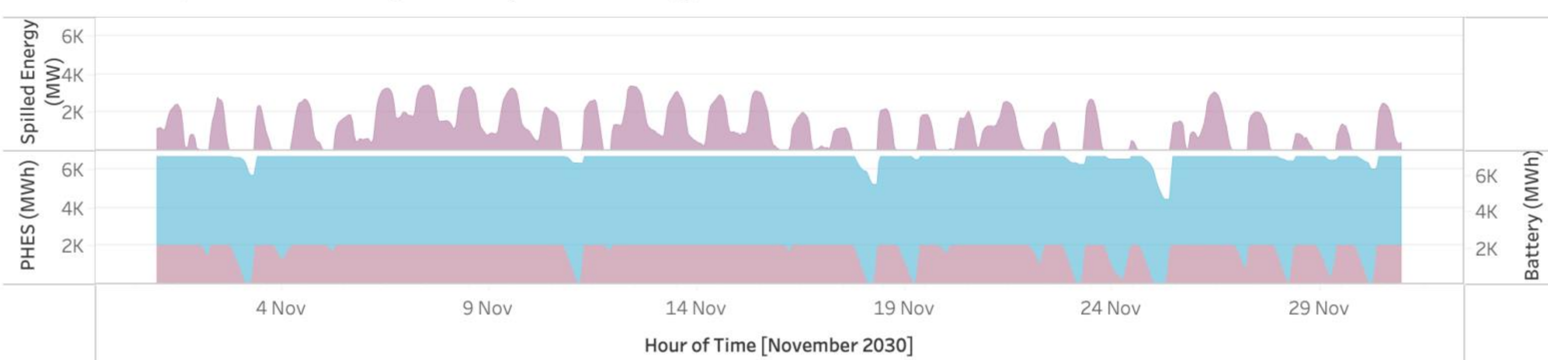

Trusted Proposal 8 - Supply vs Demand for October 2030
4000
3500
3000
2500
2000
1500
1000
500
0
Power Supplied (MW)
Demand (MW)
4 Oct
9 Oct
14 Oct
19 Oct
24 Oct
29 Oct
Hour of Time [October 2030]
Measure Names
Demand Served by Battery (MW)
Demand Served by PHES (MW)
Kidston Power MW
Bango Power MW
CG Power MW
Demand (MW)
NE Power MW


Trusted Proposal 8 - Storage and Spilled Energy for October 2030
Spilled Energy (MW)
6K
4K
2K
PHES (MWh)
Battery (MWh)
4 Oct
9 Oct
14 Oct
19 Oct
24 Oct
29 Oct
Hour of Time [October 2030]

Trusted Proposal 8 - Supply vs Demand for November 2030



Trusted Proposal 8 - Storage and Spilled Energy for November 2030



Trusted Proposal 8 - Supply vs Demand for December 2030

Trusted Proposal 8 - Storage and Spilled Energy for December 2030