SMART POWER
TOTAL ENERGY MANAGEMENT

How wholesale electricity pricing saved a water company $100k in one year.

How do you keep water supplies flowing 24/7 while still operating efficiently? One Victorian water business decided to explore the potential of the wholesale electricity market. This was not without risk, as you need to understand the dips and spikes of the wholesale market, and to make smart decisions. Get it wrong and you may pay a painful price.

Find out how Goulburn Valley Water (GVW) managed to make substantial savings in a volatile market — and lock in long-term efficiencies.

The background.

VicWater is the peak industry association for water businesses in Victoria. In 2016 it commissioned Smart Power to evaluate the potential benefits and risks of procuring electricity in the wholesale market.

There was evidence that retail margins for risk were in the range of 10-15%, which suggested that savings in this order could be made by changing from fixed price contracts to a wholesale market arrangement. Additional savings could be banked as operational changes were put in place to maximise the benefit of being exposed to wholesale pricing. This is something many water corporations are well placed to achieve, with flexible loads that can be shifted relatively easily.

Building on Smart Power's work with VicWater, GVW decided to trial the direct purchase of electricity on the spot market. The rest of this paper outlines the strategy GVW put in place and the results it achieved.

A deep dive into GVW's requirements.

Following a tender process in 2016, Progressive Green (now Flow Power) was found to be the closest match in meeting the requirements of the water authorities in its ability to provide wholesale pool monitoring and notification, and its ability to physically manage load. Initially GVW decided to hedge a high proportion of its expected demand.

However, due to changes in staff in 2017, GVW lost some of its resourcing and expertise in procuring electricity. This meant that much of the operational work that could have been done to mitigate risk and take maximum advantage from buying on the wholesale market, was not carried out. This also affected its ability to undertake market training and develop the information flows that were originally planned.

A proposed hedge of $130/MWh was rejected in late 2018 on the grounds that it was too costly. The result was that GVW went into 2019 with no financial hedges in place, and with insufficient physical hedging (i.e. demand management capability) to protect the business if high prices occurred.

Sweltering January weather puts the heat on prices.

January 2019 turned out to be an extreme month in terms of spot market pricing, particularly in Victoria.

Average spot prices were $250/MWh, representing an 88% increase on what were already high prices. This was largely driven by two hot days in the last week of January where the high temperatures, failure of some thermal power stations and a lack of wind combined to cause a shortfall in supply, and ultimately some forced load shedding on 25 January 2019.

GVW had responded to high prices a day earlier by reducing its load. However, the high price event was extended (five hours at prices exceeding $10,000/MWh), and toward the end of that period the load came back on while prices were still high. This undid much of the benefit that had been achieved.

Overall, January 2019 was a high cost month for GVW. The expensive 2019 Q1 hedge of $130/MWh which had been rejected at the end of 2018 would have been, in hindsight, a very good option.

Learning from experience.

Following its January price spike, GVW worked with Smart Power to evaluate its hedging strategy over the preceding two years. The business compared this with fixed priced contracts, using historical contract data that Smart Power has access to.

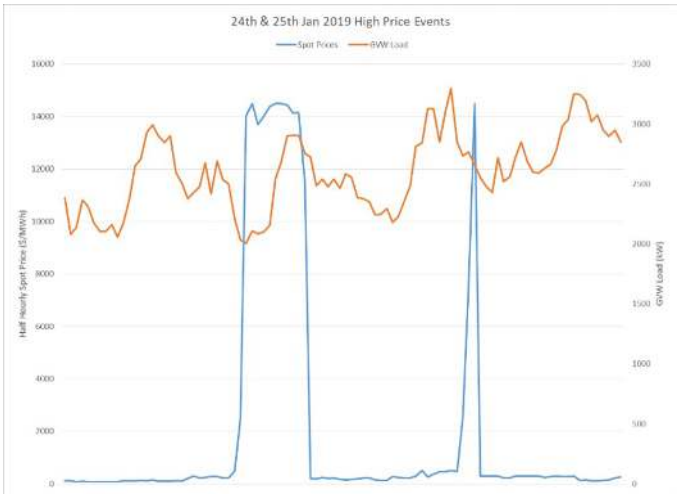

Figure 1. High price events from 24-25 January 2019.

The results showed that, apart from January 2019, in most months GVW were either the same or better off buying on the spot market. In hindsight, putting in place hedges would have generally resulted in a better outcome – particularly for Q1. The benefits of hedging were not as clear for other quarters. Following this analysis, financial hedges were put in place for 2020.

Tailoring operations to further control financial risk.

The January 2019 experience also showed that GVW needed to do better operationally to control costs and provide a more effective physical hedge against high spot prices. A 500kW reduction over 2,500kW (20%) was not enough. The fact that it came back on and exceeded the pre-event level, while the high price event was still occurring, exacerbated the problem.

The solution was to be more proactive on a site-by-site basis. So in December 2019, GVW added its Shepparton Water Treatment Plant (WTP) and High Lift Pump Station (HLPS), as well as Kilmore Waste Management Facility (WMF), to the sites providing demand response.

January 2020 turned out to be another high-priced month for spot prices in Victoria, largely driven by an event where prices went near to the $14,700 price cap between 2:30 and 7:00pm on the 31 January 2020. The average spot price for the month worked out at $143/MWh whereas the average for the month, excluding these nine half-hours, was only $75/MWh.

This was where the benefit of a financial hedge kicked in. The high price that GVW had paid for the Q1 hedge meant that it still had to pay out $5,464 on its hedge cover for the month. However, if spot prices had been as high as they had been in January 2019, they would have saved over $150,000. The hedging strategy did its intended job.

Furthermore, the operational improvements put in place meant that during the high price event, load was reduced from 3,000kW just before the event to almost 1,000kW – a 66% reduction in load. This is shown in the following graph:

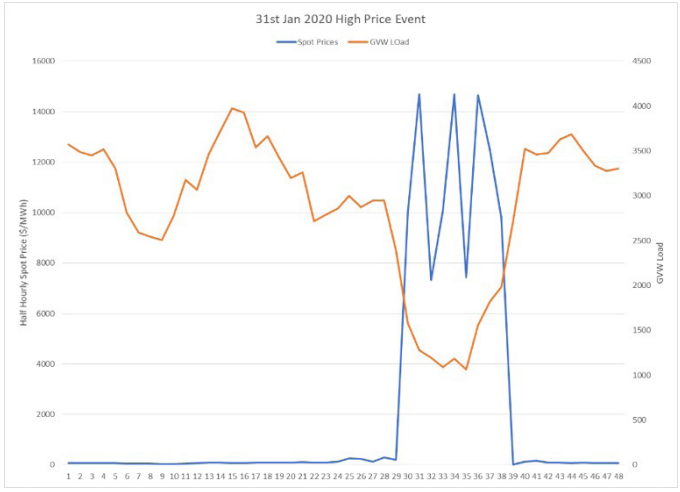

Figure 2. High price events from 31 January 2020.

Calculated savings due to this load reduction were almost $75,000 just for this 4.5-hour period.

All hands to the pump.

One further outcome has been pressure from operating staff who weren't participating in demand management, to allow their sites to become involved in the future. And because staff are also keenly aware of where energy is used in the business, they can suggest more initiatives to help reduce energy costs – for example, energy efficiency improvements.

The bottom line.

Smart Power's historical data and knowledge of contracts provides an excellent basis for comparing 'what if' scenarios with what actually happened. In the case of GVW, the sums were compelling.

In the 2019/20 financial year, GVW saved close to $100,000 compared to the alternative of signing a fixed price contract in May 2019.

Looking ahead, there is the potential to further increase savings with improved operational response and more optimal hedging strategies.

Key learnings.

The experiences of GVW purchasing electricity in the wholesale market can be applied to almost any enterprise, but especially those with flexible load or energy storage options. Here are some tips for businesses to consider:

- **Engage a retailer who will work with you** to develop processes to manage your financial instruments (i.e. hedges) as well as assisting you operationally, especially when you are first moving from fixed price contracts to navigating the wholesale market.
- **Hedge to a high level early.** Revaluate once you have found out how your business tends to operate in the electricity market. At first glance, hedges may look expensive but events may prove otherwise. Remember that hedge prices are arrived at by trades between industry participants who generally have a good idea where spot prices may trend.
- **Balance financial hedges with physical hedging** (i.e. demand management) to maximise control.
- **Develop load management skills** with operational staff. You can start by communicating your strategy. Getting staff involved is crucial in maximising the value of physical hedges available to the business.
- **Operational staff can add even more value** in the long run as they become more concerned with the business' energy use and cost.