

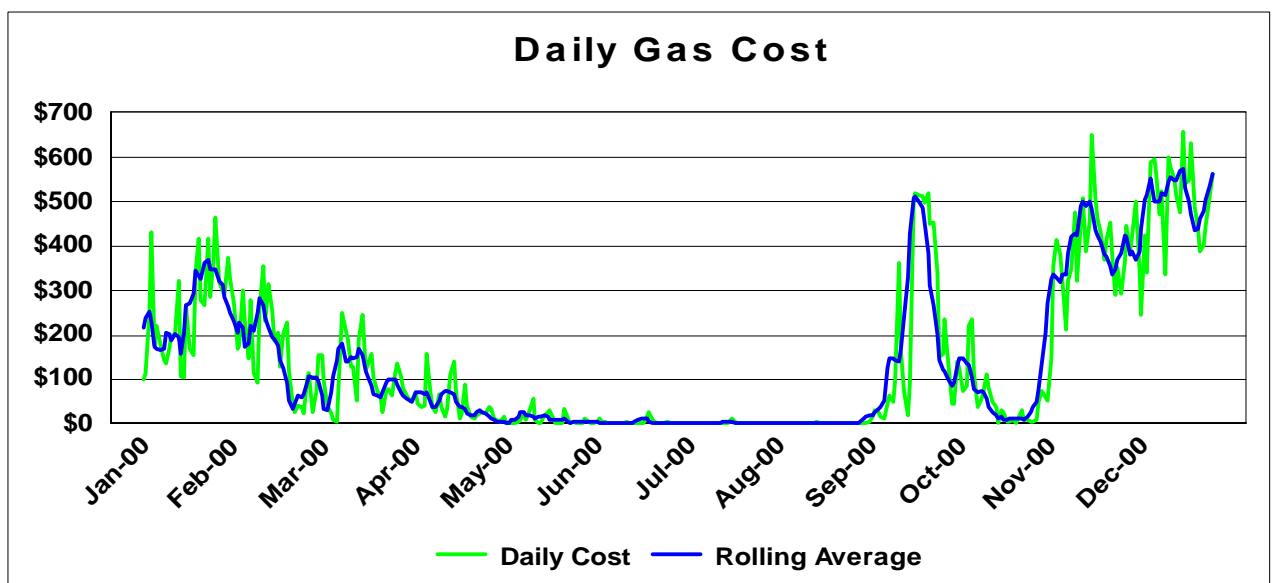
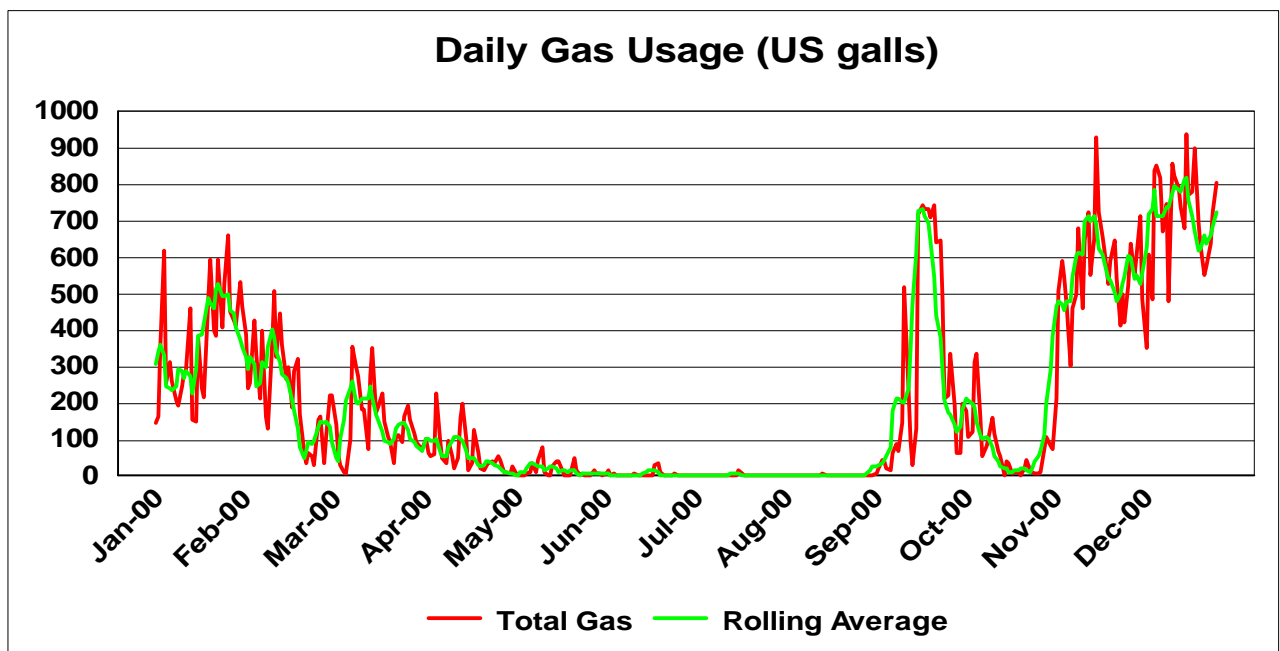
Gas Use on US Breeding Unit : Case Study

This case study covers heating records from a 2500 sow unit in mid west US.

Room Type	Number	Heater No & Type	% of capacity	% of usage
Farrowing	10	2 x 60,000 Btu	26%	32%
Boar & Gilt	2	5 x 250,000 Btu	68%	63%
isolation	2	1 x 115,000 Btu	6%	5%

Gas use has been estimated from logged heater use data and heater ratings.

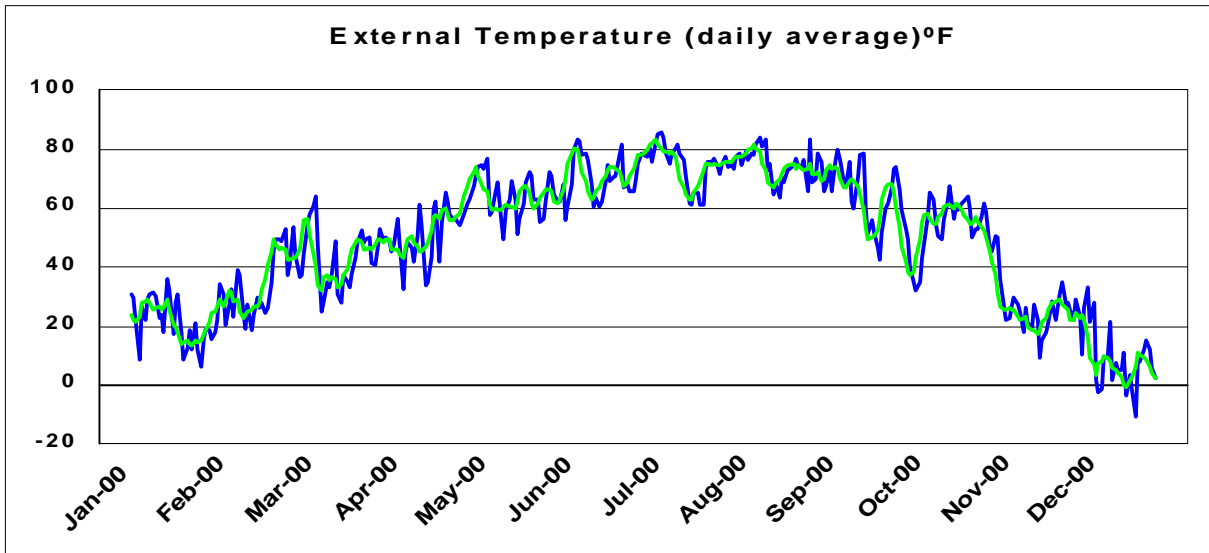
As may be expected, gas use varies considerably throughout the year.



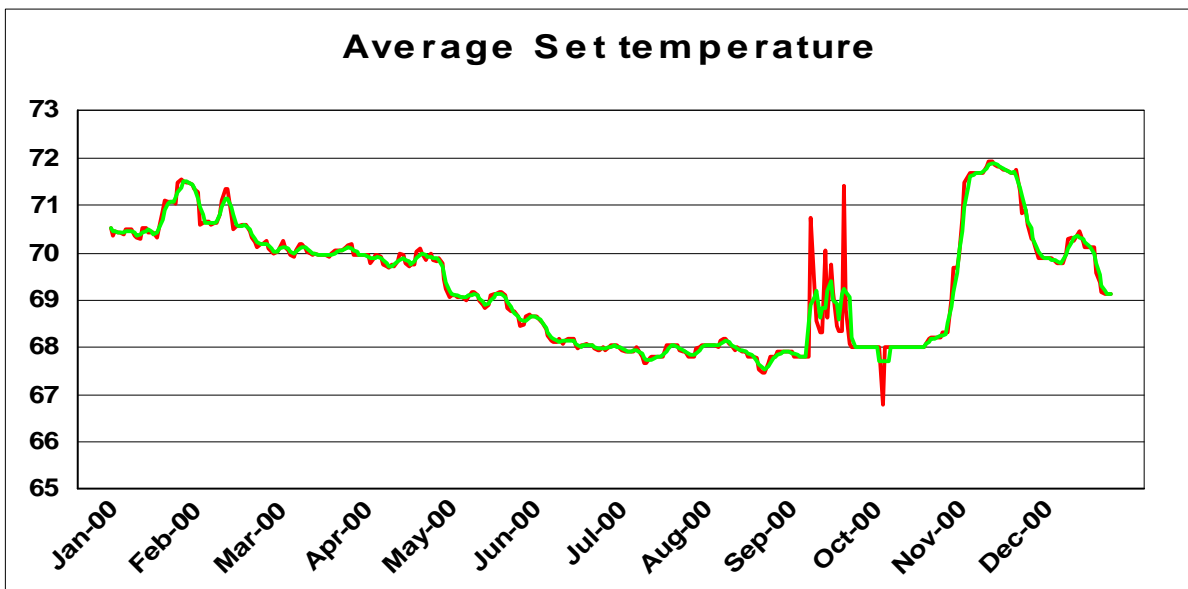
As you can see, the costs are by no means trivial - up to \$650 **per day**. You'll notice there is a sudden massive increase in the middle of September for a short while, then a sustained increase early November.

There are three main reasons for this.

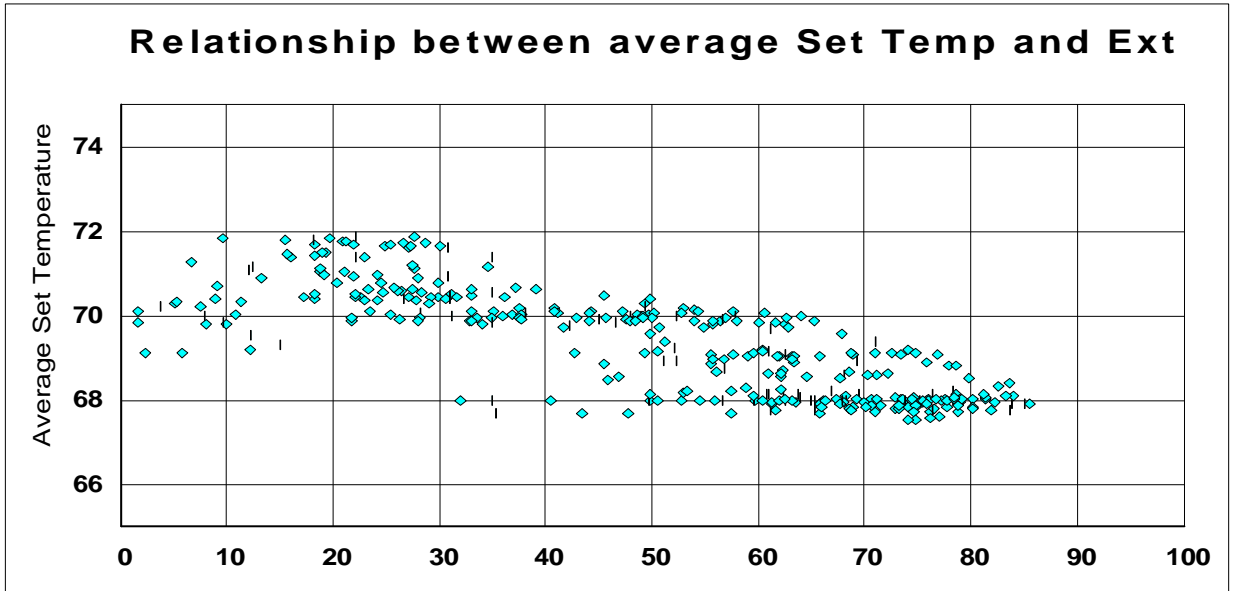
Firstly, outside temperature dropped in September, and then more sustained in early November. The greater the temperature lift required (temperature difference between inside and outside) the greater the heating required.



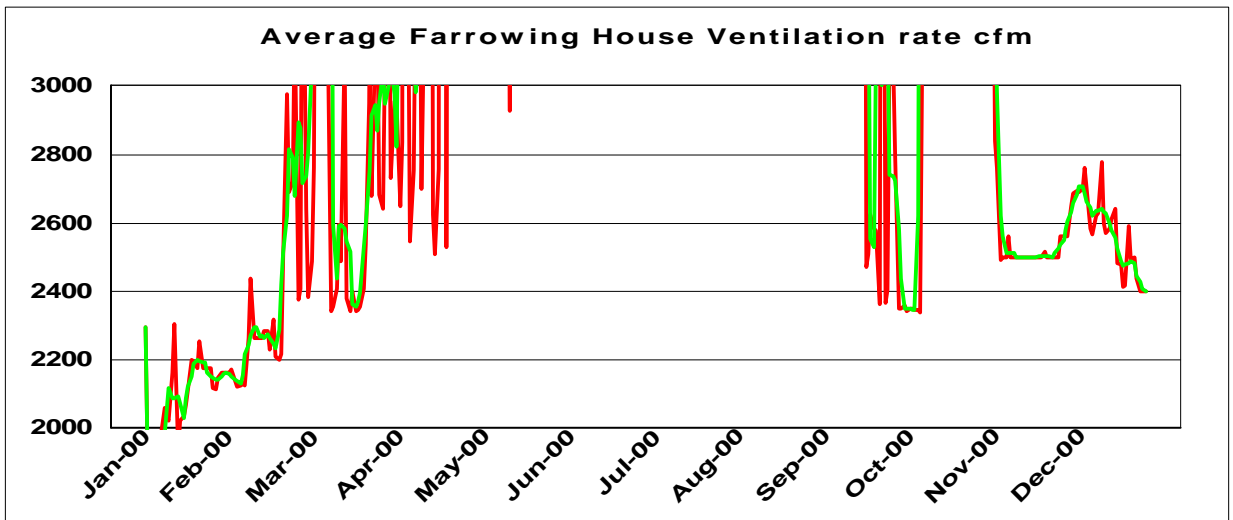
Secondly, set temperatures were increased in the farrowing rooms when outside temperature dropped, increasing temperature lift required. This is partly explained by a temporary change in use of the farrowing rooms - the site was being restocked and the farrowing room used to re-house replacements. However, this doesn't really explain the gradual drift down in set temperatures during the summer, and the way that sudden changes in outside temperature coincide so clearly with sudden changes in settings.



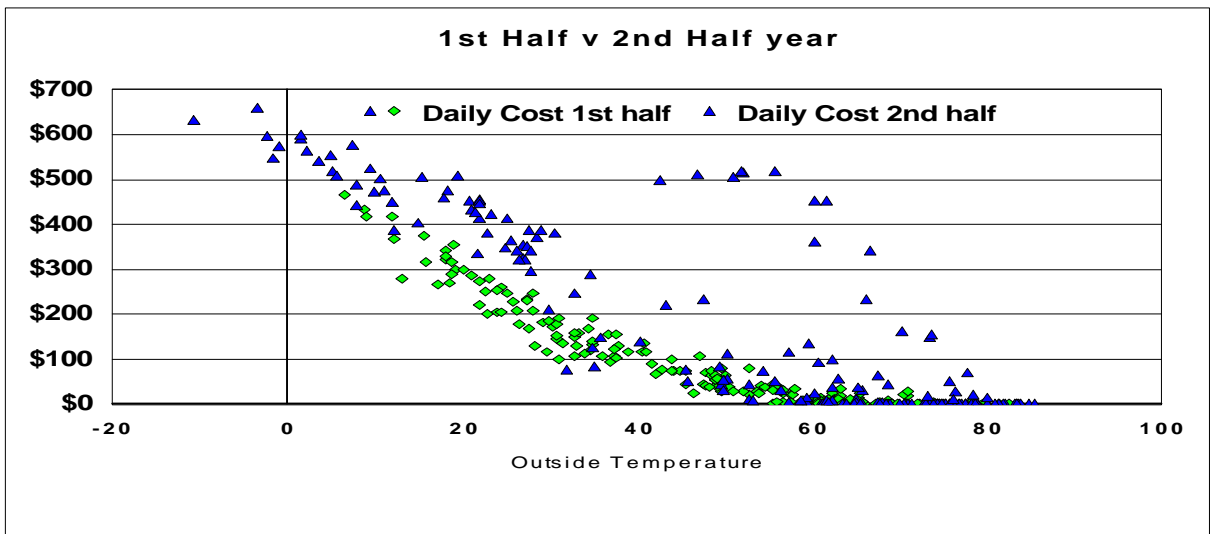
In fact, there appears to be a relationship between Set temperature and External Temperature. That is, when outside temperature drops, inside set temperature rises.



Thirdly, farrowing room minimum ventilation rates were around 20% higher later in the year.



In the first half of the year, a clear relationship between outside temperature and heating cost can be determined, which is around \$13/day per °F below 45°F.



In the second half, the relationship is by no means so clear. There are significant number of occasions when heating use is high despite relatively mild outside conditions. However, on

average the usage is \$76 greater, and on a like for like basis at lower outside temperatures, it is \$70 to \$150 greater.

Relating these figures to a cost per unit output, the range is dramatic. Whilst the average is around \$1, the range is from \$0 to \$3.50.

Similarly, there is a significant effect on cash flow. This farm will have been used to gas bills around \$1-\$2,000 in the winter period, and has suddenly found an extra \$2-\$3,000 disappearing from cash flow.

Summary

This case study illustrates the substantial range of gas use throughout the year, which has a significant effect on costs.

By far the greatest effect is that of external temperature - heating required has a direct relationship with the required temperature lift.

However, it is clear that the way that control systems are used also has a substantial effect. Lowering set temperatures in the spring undoubtedly led to lower heating costs. But conversely, raising set temperatures and minimum ventilation rates was a significant factor in the much higher costs incurred in the latter half of the year on this farm. Together, they appear to contribute around a third of the increased usage.

In such studies, It is all too easy to concentrate on one cost parameter to the exclusion of more important issues. Nevertheless, the scale of the costs incurred suggest that time and effort in identifying a rational basis for settings used would be beneficial in view of potential cost savings.

