

EMSOL UPDATE JUL 2017

Please feel free to forward this newsletter to your financial controller or others who have an interest in energy savings.



Emsol's July 2017 Update includes five important topics:

1. EECA Strategy 2017/8
2. Process Heat Energy Saving Tips
3. Emsol's Expertise and Achievements in Process Heat
4. Emsol Case Studies
5. Seasonal Refrigeration Opportunities



1. Strategic Changes at EECA

As of this month, the government is tightening its strategic focus on what it believes are the most vital opportunities for energy efficiency and reduced carbon emissions across the energy sector. This is highlighted in EECA's 'New Zealand Energy Efficiency and Conservation Strategy 2017 – 2022' as follows:

"As a party to the historic Paris Agreement on climate change, New Zealand is committed to reducing greenhouse gas emissions. Our target is to reduce emissions to 30 per cent below 2005 levels by 2030.

New Zealand's greatest potential to reduce carbon lies in our process heat sector for industrial and commercial users (e.g. boilers, kilns, and dryers), and in our transport sector; both have a much larger proportion of non-renewable energy than electricity."

Most EECA programmes will be adjusted over time to reflect this revised target.

Resource Link: <http://www.mbie.govt.nz/info-services/sectors-industries/energy/documents-image-library/NZEECS-2017-2022.pdf>

2. Process Heat Energy Saving Tips

Process heat includes combustion systems that run on fossil fuels or biomass, electrically heated systems, and heat recovery and exchange systems. About 60% of New Zealand's process heating energy comes from the combustion of fossil fuels. Electricity and renewable energy resources supply the rest. Advanced processes, improved designs, and thermal efficiency gains are helping to reduce the environmental impacts of combustion-related emissions.

Best operating practices, reconfiguring existing designs, and using new advanced process heating technologies can lead to significant energy savings at your plant. Some typical and quick opportunities for increasing the efficiency of process heat systems are listed below (Save 2%-15%).

Heat Generation

- Tune regularly air-to-fuel ratio in burners and boilers
- Preheat combustion air, use heat recovery e.g., economisers
- Review production times and rates to reduce boiler run hours



Heat Transfer

- Clean and improve heat transfer in the furnace (remove scale, soot, consider an acid clean)
- Stop heat escaping (for pipes AND valves; fix leaks, and use insulation and snugly fit valve wraps)
- Balance hot water flows and reduce supply temperatures to the minimum needed

Heat Recovery

- Preheat boiler feed water or hot air supply systems using heat recovery
- Recover heat from flues, condensate, refrigeration, air compressors, extract ducts, or warm waste lines



Supporting Technologies

- Locate control sensors correctly
- Consider using solar heating and high efficiency heat pump technology
- Install high-turndown combustion systems
- Use programmed heating temperature setting for part-load operation
- use modulating burners and/or variable speed drives for boiler controls
- Use furnace pressure controls
- Consider oxygen trim controllers



3. Emsol's Expertise and Achievements in the Process Heat Area

For over 15 years Emsol has worked with a number of large industrial sites to improve the efficiency of their process heat systems. This has resulted in increased production, reduced energy use, or both.

Often, the original process heat designs are no longer efficient due to changes in production over time. Systems become undersized, oversized, or operate at too high a temperature or pressure. Also, plant becomes corroded, worn, or insulation degraded. Our focus has been to work closely with our clients to create customised energy saving solutions. Many energy saving projects have been in the food and wood processing sectors.

We have found that thermal fuel prices are often much less than electricity prices. However, the annual cost of thermal fuel is more than electricity for many businesses. This is because they use significantly more thermal energy than electricity and often there are more losses and inefficiencies associated with thermal energy. This means that the less expensive energy prices can still accumulate to large costs. We are keen to help assess quickly process heat systems to identify energy saving options and implement solutions.

We regularly see businesses with many untapped thermal energy savings opportunities. Emsol's clients have achieved between **10% - 40% in process heat energy savings**. Our clients have collectively saved **\$1 million** per year on thermal energy costs, within the last three years. In addition to cost savings, minimising heat losses reduces the load on boilers or heat plant, making the working environment cooler, safer, and more comfortable. In some cases, this can also lead to increases in production.

4. Relevant Emsol Case Studies

Affco's Manawatu site has saved 12% in natural gas in the past 12 months, thanks to the installation of a condensing economiser on its boiler, installing proportional control valves to a hot water tank, and being diligent with the management of hot water use.

Affco's site at Malvern has saved 15.5% of its coal energy in the past 12 months, as a result of changes to its hot water mixing and distribution system. It has also improved cleaning methods including a newly implemented 'dry clean'.

Also, refer to <http://emsol.co.nz/reduce-energy-costs/case-studies-2/> for other case studies.

5. Seasonal Refrigeration Opportunities (offset high electricity prices)

Colder ambient temperatures during winter months present refrigeration energy saving opportunities:

- Decrease compressor discharge pressure during winter months, which increases the efficiency of refrigeration compressors.
Increase suction pressure during winter months or periods of low production. This increases compressor capacity and reduces electricity consumption.
- **Useful rule of thumb: For each degree Celsius the discharge pressure is lowered or the suction pressure is raised, compressor efficiency increases by 2-4%.**

Affco's site in Wairoa reduced its engine room electricity consumption by 22% for 8 months of the year by lowering its discharge pressure set point.

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