

NZ SOCK COMPANY IMPLEMENTS ENERGY EFFICIENCY

A Textiles NZ energy efficiency programme has found opportunities to reduce the energy bills of Ashburton-based NZ Sock Company by 13%. Those are cost savings that go straight to the bottom line.

In 2010, Textiles NZ ran an energy efficiency pilot programme, supported by the Energy Efficiency and Conservation Authority (EECA). The programme delivered some great results. Four textile manufacturers, all members of Textiles NZ, participated in the programme, receiving subsidised energy assessments and then grants towards the cost of implementing changes. The four companies that worked on improving their efficiency included:

- Yakka NZ Ltd, Auckland
- Design Spun Ltd, Napier
- New Zealand Sock Company Ltd, Ashburton

The New Zealand textiles sector consumes around 1 petajoule (PJ) of energy every year. That's about the same amount of energy used by 24,000 New Zealand households.

Results of four New Zealand textiles energy assessments

Textile business	Annual energy spend	Annual energy savings identified	Savings as % of spend	Savings with zero implementation cost	Savings with less than 12 month payback
1	\$356,721	\$45,675	12.8%	\$10,078	\$24,541
2	\$62,788	\$8,097	12.9%	\$2,893	\$6,922
3	\$104,356	\$15,936	15.3%	\$4,840	\$8,683
4	\$87,257	\$14,235	16.3%	\$1,167	\$3,404
TOTAL	\$611,122	\$83,943	14.3% (avg)	\$18,978	\$43,550

(note: the order of the companies in the table does not relate to the list above)

Euan Sparrow, CEO of NZ Sock Co decided to join the programme because *"improving our efficiency and lowering our variable costs is one of the best ways to compete with those operating out of lower cost economies. We were really happy with the results of the assessment and the ongoing savings we are making as a result"*

NZ Sock Co uses around 500,000 kWh of energy every year, made up of one-third LPG and two-thirds electricity. This costs them a total of just over \$60,000 per annum.



A half-day site assessment of the NZ Sock Co site in Ashburton was conducted by energy auditing specialists, Energy NZ Ltd, on behalf of Textiles New Zealand. The engineers from Energy NZ looked at the major energy using areas of the site and assessed the potential to improve efficiency. The result was an assessment report detailing seven main opportunities to save energy. NZ Sock has since implemented six of the seven recommendations, saving themselves around \$7,500 in annual energy costs.

Steve Dean, Operations Manager at NZ Sock, feels that the independent advice was invaluable to them. *“I was very pleased to have outside expert advice from a source that I knew wasn’t trying to sell me new gear”* says Steve.

Once they received their energy assessment report NZ Sock management formed an energy action team to work through implementing each opportunity. The team chose one initiative to work on each month and worked their way through the list of recommendations.

The opportunities for efficiency gains were found in compressed air systems, boiler systems, pipework insulation, and lighting.

Compressed Air

Compressed air is used commonly throughout the textiles industry. But, compressed air systems are notoriously inefficient. An air compressor wastes about 85% to 90% of the energy it consumes. This makes compressed air probably the most expensive utility per unit of work it delivers, and should make it a priority when looking for efficiency gains.

It is quite common to find compressed air leaks of more than 25% in a compressed air system. Auditors of NZ Sock Company found a compressed air leak of around 20% and

estimated that this was costing \$1,758 per annum in wasted energy. These leaks were relatively simple to fix and delivered immediate savings.

The auditors also found that the compressor was running with relatively short cycle times because it was set to load at 7.0 bar and unload at 8.0 bar. These setpoints meant there was energy being unnecessarily wasted in the unloading part of the cycle. As the plant only requires compressed air at 6.2 bar the recommendation was to change the setpoints to 6.5 bar for loading and 8.5 bar for unloading. This was estimated to save \$738 per annum

Boiler

Boilers are widely used throughout the textiles industry and are major energy consumers.

A failed ballcock in the header tank of the boiler at NZ Sock Co meant that hot water was overflowing and being displaced by cold mains water. A simple repair of the ballcock was undertaken and has resulted in an estimated \$1,533 annual energy cost savings.

A pressure relief valve was also found to be leaking steam, representing wasted energy. Fixing this steam leak has saved \$388 in annual energy costs.

NZ Sock Co worked closely with their boiler maintenance company to make these recommended changes. While discussing these efficiency opportunities the idea of utilising the hot return water was raised. Steve Dean says *"We had been sending wool socks to a commercial laundry for a finishing wash, which conditions the wool. This was costing us around \$25,000 a year. Now we have diverted some hot boiler return water to an industrial washing machine that we already had on site and we do the washing ourselves for a much lower cost. This was a great initiative that would not have come about if we had*



not started looking at energy efficiency.”

Pipework Insulation

Pipework insulation is important to prevent heat loss and therefore energy wastage. Steam lines (usually over 150°C), condensate return lines (100°C) and boiler feedwater lines (40-65°C) should all be insulated. Insulating these hot pipes with a suitable glass wool or foam insulation will reduce heat loss by around 80%. Valves, flanges and steam traps that require access cannot be covered with normal insulation, but in some cases can be covered with removable insulation jackets to give further energy savings.

NZ Sock Company has very good pipework insulation throughout their Ashburton plant. Auditors did find some small areas that could still be insulated and estimated that doing so for \$400 will save \$235 a year in energy costs.

Lighting

Every manufacturing site has specific lighting requirements. The amount of light needed depends on the use of the area and the level of occupancy. There are often opportunities to save energy by reducing high lighting levels, improving control of lighting, and replacing old lights with new technology.

The audit of the NZ Sock facility found that lights were being left on for long periods in areas not used after hours. By switching off lights in unused areas at night and only keeping the night manufacturing area lit it was estimated that almost \$3,000 in energy costs could be saved. Even better, these have zero cost to implement.

A further opportunity was found to install a separate lighting circuit for the dispatch area that was part of one larger circuit. The skylights in dispatch let in large amounts of natural light and now staff in dispatch can turn lights off when the natural light levels allow. This is estimated to save \$552 in energy costs per year.

NZ Sock has also been gradually replacing their current lighting with new, energy efficient, high-bay fluorescent tube light fittings. Rather than wholesale replacement that incurs significant upfront capital expenditure, they are replacing them as the old fittings fail. This type of lighting often has a payback of less than two years.

Participating in the Textiles NZ Energy Efficiency Programme has been a tangible benefit to NZ Sock Co. *“We are much more conscious of our energy use since the assessment”*, says

Steve Dean, Operations Manager of NZ Sock Co, *“and I would recommend this kind of structured approach to energy efficiency to all other textile companies”*.

For information on Textiles NZ and its programmes visit www.textilesnz.org.nz. For more information on energy efficiency for business, including real case studies, visit www.eecabusiness.govt.nz.

Written by:

Simon Wilkinson

Textiles Energy Efficiency Programme Coordinator