

Energy Efficiency: Back to Basics



The drive to reduce carbon emissions offers a fresh start for executives trying to make energy efficiency gains. With governments furiously legislating on climate change and setting steeper targets for reduction, improvements in energy efficiency are the quick fix. Renewable energy systems make for nice photographs, but do nothing to reduce underlying energy demand. They also tend to have very long payback periods – longer than those for energy efficiency investments.

Society can achieve the bulk of carbon emissions reductions necessary by simply reducing demand. ERM has worked with organizations on energy usage reduction programs which have typically generated a 10-30 % reduction in energy usage with minimal investment. All too often we find the engineers holding a long list of unfunded breakthrough projects while the simple, less exciting heat and pressure recovery projects get no attention. Compressor leaks are our favorite. At one sophisticated engineering company we found enough leaks in the compressed air system to eliminate an entire compressor.

By concentrating on the simple solutions with a low cost per reduced kilowatt hour we have gotten a number of energy efficiency programs unstuck. When we built a marginal abatement cost curve for a large bus operator driver training was 100x cheaper per tonne of emissions reduction than hydrogen buses.

Governments are increasingly looking to the business community to play their part in achieving reduction targets. The introduction of the Carbon Reduction Commitment in the UK which sweeps another 5,000 companies into the CO2 regulatory net is one example of the creeping pressure on business.

Businesses tend to take leader or laggard positions on these sea changes. Some see a great opportunity to improve their bottom line performance and boost their green credentials at the same time. Others focus on compliance costs and wait for legislation to “hit.”

Improving energy efficiency could provide 50% of the emissions reductions needed to prevent the Earth warming by more than 20 C - the general international consensus for a manageable level of climate change. Energy efficiency techniques are the only “technologies” with a material impact in terms of emissions reductions that actually save money. Too bad the scientific community is starting to whisper that we have already zoomed past the 20 C mark.

With minimal investment, companies can make immediate reductions in carbon emissions and long-term, year on year savings in energy costs. As energy prices start climbing again, the savings can only get larger. Many energy saving opportunities can generate a return on investment in a matter of months while ‘step change’ capital investment projects can typically make a return within 18 to 24 months. As David O’Reilly, the chief executive of oil and gas giant Chevron, has said, energy efficiency is the cheapest form of energy we have. .

Businesses can make savings in a number of ways, either from machinery and processes they use - air compressors, Heating, Ventilation and Air Conditions (HVAC), IT etc - or from the buildings they operate in. In the UK approximately 35% of emissions come from the built environment. New buildings only represent roughly 2% of the building stock with 98% being older buildings constructed during a period when construction costs rather than operating costs were optimized

To ensure that these old buildings function sustainably now and into the future, there is a need to address their energy usage. The first step is to install monitoring and metering equipment. Simple measures of energy usage highlight the correct place for action. At one company we found a seldom used machine shop heated 24 hours a day through the winter.

Often it is just the basics. At one construction site we visited the temporary power supply had a timed, central cut off. No one had to shut down heaters, lights, and standby equipment. Frequently we find “switch off” routines have lapsed – four pumps are running when three can do the job or cooling water is circulating when no one is in the mineshaft. Any industrial site that has reduced volumes during the credit crunch has a opportunity to resize their energy services.

However, to make a long term difference, staff and stakeholders need to be engaged in any energy reduction program. Energy reduction awareness training and communications solutions that give staff access to real-time data need to be incorporated in any end-to-end energy management program. At one company two revolving usage meters were connected to two light bulbs in the car park – one a standard tungsten filament bulb, the other a compact fluorescent. Every employee everyday could see one disk revolving at ten times the speed of the other.

These are the sort of simple and effective steps companies can take to reduce energy usage, move towards achieving government targets and cut costs. Putting a photovoltaic panel or wind turbine on the roof of a company office or production facility may save carbon by satisfying an existing demand and look good on the cover of the annual report, but it's the energy efficiency projects that will impress in the future.

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