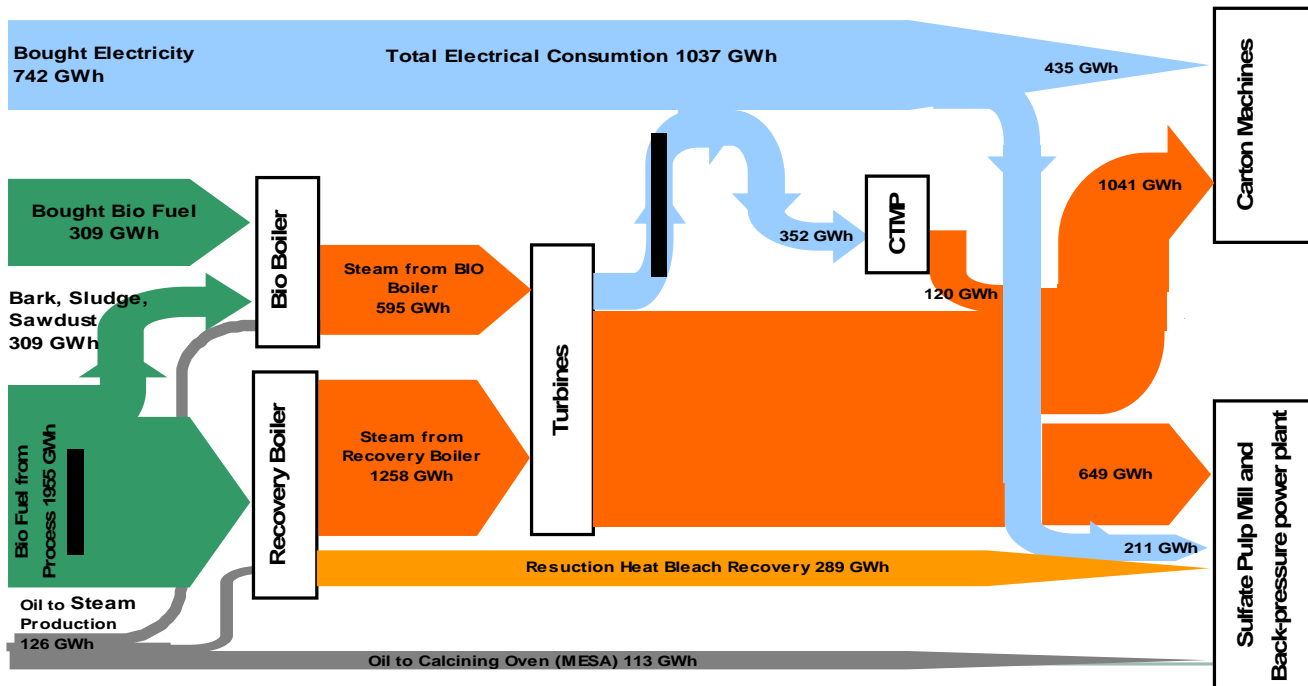


INDUSTRIAL ENERGY EFFICIENCY – A WSP CAPABILITY



Energy Efficiency brings out double benefits:

- Reducing greenhouse gas emissions
- Lowering production costs

Improving energy efficiency is without doubt the most efficient way to reduce carbon dioxide (CO₂) emissions. Energy efficiency and reduction of operational costs are becoming vital in all energy intensive industries. Together with higher energy prices, companies are also facing stricter local legislation with respect to CO₂ emission rights and eco-taxes.

So why pay more than you have to?

Increasing costs for energy is predictable. This, in combination with low interest rates, is at present an excellent incentive to invest in energy saving measures. WSP has successfully developed an advanced concept for Industrial Energy Efficiency Improvement. Experience from efficiency programs carried out in manufacturing industries demonstrates that energy cost savings of up to 10 to 20 percent are achievable with only small investments.

The WSP concept involves all industry stakeholders e.g.:

- Production
- Maintenance
- Management

The benefits are achieved step by step following structured and standardised routines where we have been using well-trying efficient tools.

The key steps are:

- Audit
- Implementation
- Follow ups

Our wide range of specialist competence within WSP means all actions can be conducted by in-house personnel covering areas such as:

- Utility Metering
- Data and Billing Management
- Energy Contracting Management
- Building Physics
- Building Management System Engineering
- HVAC Engineering
- Sanitary Engineering
- Electrical Engineering
- Compressed Air Engineering
- Cooling Systems Engineering
- Staff Training and Energy-Awareness Programmes

At WSP, we ensure our clients to gain considerable value as well as effective improvements in energy performance from our energy efficiency programs.

WSP contacts for Industrial Energy Efficiency:

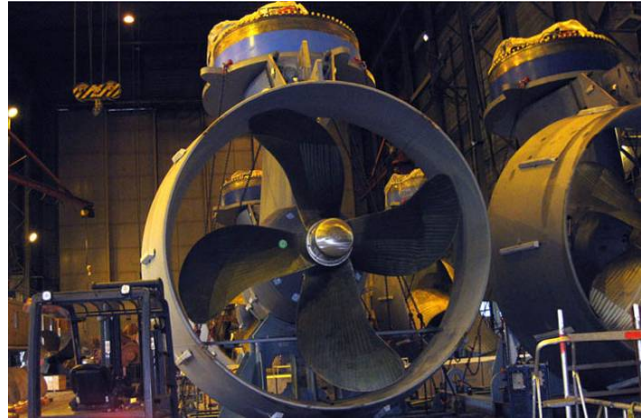
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INDUSTRIAL ENERGY EFFICIENCY – OUR REFERENCES



Swedish Match, Gothenburg Sweden

The biggest snuff factory in the world.

At this site Swedish Match produces snuff from 4,000 tonnes of raw tobacco. In 2006 WSP was awarded an assignment to carry out an Energy Efficiency Audit.

In “light industry” the main consumers are lighting and ventilating (heating). In this case it represented some 60 percent of the total energy consumption cost. The audit showed a potential saving of around 10 percent of the energy cost which represented 50,000 €. The investment costs for this was estimated at 30,000 to 50,000 €, representing a pay back in less than a year.

Rautaruukki Ltd, Ruukki Construction, Finland

Energy audits of steel industry.

WSP provided energy audit services to the leading Finnish metal manufacturer and technology company with operations in Sweden, Norway, Poland, Hungary, Ukraine and Russia.

WSP investigated energy consumption, related costs, CO₂ emissions and the potential for energy efficiency intensification in three Finnish Ruukki factories. In those industrial units, our work led to a decrease of 507 tonnes in CO₂ emissions, and annual monetary savings of 80,000 € with a one-time investment of 145,000 €.

The recommendations, experiences and solutions from the audits are to be incorporated in the local energy management action plan at Ruukki factories across Europe.

John Dewars and Sons, UK Scotland

WSP undertook a full site wide energy audit at this major Whisky distillery in Scotland. This audit including profiling of energy consumption on site, a review of current energy monitoring and targeting techniques undertaken along with a review of tariff features such as electrical availability contract levels. Our audit also included a detailed assessment of the key industrial plant and equipment on site, including pumps, motors, refrigeration, heating and lighting, in order to provide a prioritised list of operational and capital improvements to be made across the site, which would produce energy and significant cost savings. A further feature of our audit was a high level feasibility review of the potential for the implementation of renewable energy generation technologies within the site.

Chemring Energetics, UK Scotland

Chemring Energetics UK Ltd provides equipment based on energetic materials (explosives and propellants) for the defence, paramilitary and key commercial customers. WSP conducted a detailed energy efficiency audit at their plant in Scotland which was based on a preliminary profiling of site energy demand. Our detailed study then included a full steam demand / provision comparison study, through metering analysis. A study was then undertaken on the potential for steam generation decentralisation along with an initial feasibility evaluation for the imple of combined heat and power at explosives site.

Roche Pharmaceuticals, USA

Every motor 10 kW or larger in this chemical manufacturing plant was audited, monitored, and analysed to identify opportunities to downsize the motor, replace it with a premium-efficiency motor, and install a variable-frequency drive (VFD). Whenever possible, existing oversized premium-efficiency motors were used to replace outdated larger motors. By correctly matching motor sizes to loads and replacing lower-efficiency motors, substantial energy savings and peak electric demand reductions were realised.

In addition, energy audits of the process cooling and heating systems identified opportunities for further energy efficiencies. Chillers serving chemical manufacturing process cooling loads and boilers serving process heating loads were instrumented and monitored to determine hourly load profiles. These loads were simulated to enable analysis of the impact of hourly weather variations on the cooling system heat rejection equipment. Congruence of process heating loads and cooling tower heat rejection suggested the viability of recovering waste heat to apply to process heating requirements.

Two alternatives were investigated. Heat recovery from the chilled condensers and gas-fired engine-driven chillers with waste-heat recovery equipment. Ultimately, each of these approaches was applied in different parts of the plant and substantial energy savings and peak electric demand reductions were realised.