

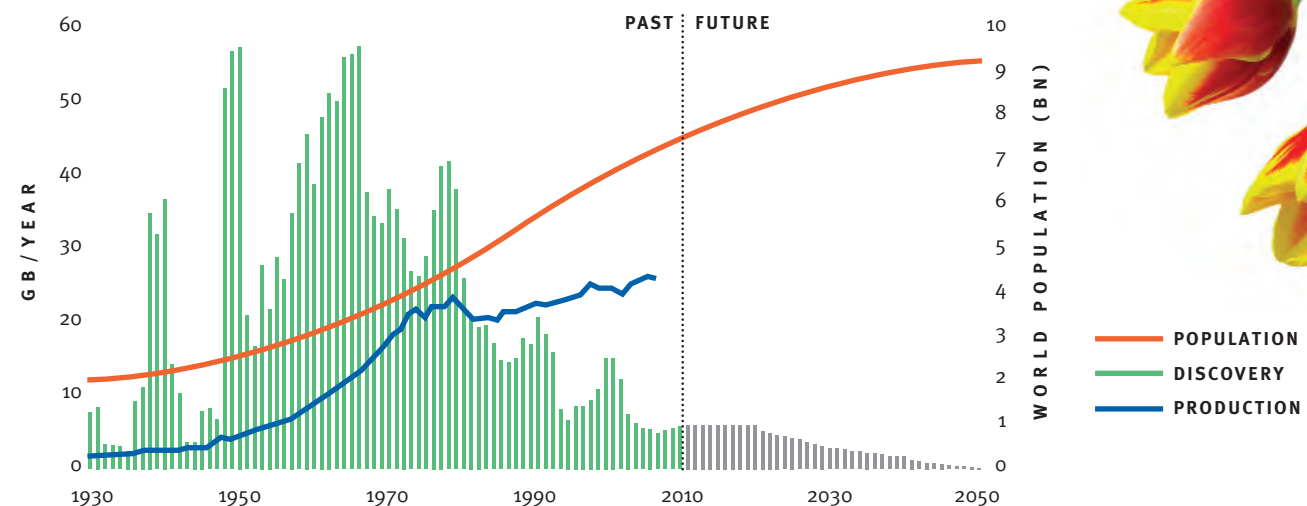
Change is the constant, the signal for rebirth, the egg of the phoenix.



GreenProduction:

IT AFFECTS YOUR COMPETITIVENESS.
IT AFFECTS YOUR IMAGE.
IT AFFECTS YOUR FUTURE.

With energy costs rising and global resources falling, every business must scrutinise its consumption and produce a Greenprint to retain a competitive edge.



— POPULATION
— DISCOVERY
— PRODUCTION

Every single one of us, from major companies to private households, faces increasing energy costs. Our consumption may remain pretty static, but our bills keep going higher. And it's going to get worse, because the world's natural energy resources are limited, but our population keeps growing and growing.

In 1974, around 4 billion people lived on our planet. By 1999, this had jumped to 6 billion and it's estimated that in 2050 there will be around 9.2 billion of us - an increase of 77 million or 1.2 % per year. Another troubling statistic is that currently, just 1.2 billion people live in well industrialised countries, so 5.2 billion people will increase their energy usage as they attempt to catch up.

Contrast that to the obvious fact that, excluding renewables, the world's energy resources are limited. The estimated lifespan for natural gas is approximately 65 years and 43 years for crude oil (for known exploration fields and constant energy demand).

Energy and petrochemical companies are also producing 4-6 % less oil than in previous years. 'The investment to keep the production level is around \$30bn each year and a certain oil price is needed to invest', Peter Vossier, CEO of Royal Dutch Shell recently told Germany's Handelsblatt.

Energy Management is not an option, it's a necessity

Faced with this growing population and dwindling natural energy resources, what parameters will an organisation need to set itself to ensure production or service provision competitiveness?

One absolutely key measure will be the energy demand per item produced or service provided and the only way to efficiently deliver this is by implementing a load carrying and sustainable Energy Management that is driven by internal excellence and routine best practice. This will ensure the highest energy efficiency, predictable energy demand, reduced and controlled costs, and altered energy consumption behaviours and attitudes.

How much, if anything at all, companies currently invest in Energy Management depends mainly on their size, as well as the attitude of their top management towards 'GreenProduction'. The bigger the company and the higher their public profile, the more likely they are to adopt green solutions.

Bigger companies also have the advantage of being able to release employees from their ordinary work to focus full time on Energy Management. Medium-sized and smaller companies cannot normally afford this luxury. There can be no doubt though, that if a company can take the time and effort, and in some cases



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the investment, to really understand how energy efficiency can be improved, it will gain significant value and increased profitability.

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Different organisations face different energy challenges. Heating costs are the biggest problem for service providers, whereas in industry the challenge is reducing electricity costs. Many companies try to reduce their consumption, but fail due to lack of transparency, control, time, manpower, knowledge and sustainability. Energy consumption is also often taken for granted by employees, despite the fact that 15-50 % of the costs can often be saved.

To tap into an organisation's full potential for energy saving, Celerant recommends that its Clients apply the Celerant 5 Box Model[®],

which examines Energy Production and Energy Consumption across in every facet of their value chain.

Take for example, steam production. Imagine that a large waterspace boiler is operating as a steam producer for a chemical plant and has 2 MW power. The boiler efficiency is around 84 % and there are distribution losses of approximately 15%. So the overall efficiency of the system is around 70%, with an energy cost of 2.7 cent per kilowatt hour (kWh).

The boiler requires €300,000 each year to produce 1.4 tons of steam/hour at 7 bar pressure, assuming 8496 operating hours and one start. 15-20 % of the end energy equals €50,000 of the energy bill and by increasing efficiency that can be saved.



What gets measured gets improved

If a company wants to maintain its competitive edge, it's vital that it gets to grips with GreenProduction and encourages real behavioural change among its workforce:

- Start to monitor your energy consumption

This should begin with the implementation of key performance indicators (KPIs) and a measurement system for energy consumption by type and area. The second step is to set an energy target for every service or produced item. This will enable you to prioritise and focus on the biggest energy consumers in your plant.

- Draw the process, locate the biggest consumers

A process map of your energy consumers and the value of their consumption will enable you to identify old or bad connections. Improvements can then be made and consumption and demand re-tracked and recalculated.

- Select new equipment

In the example mentioned earlier, a new high-speed steam-raising boiler was selected. The new boiler will be in the range of €100,000-€125,000 (including erection and auxiliary equipment). The new boiler will be able to operate with constant efficiency at 94% in a load range from 20-100%. With a distribution efficiency of 90% the overall efficiency will increase up to 84%.

- Train your operators in SIC

As well as training on any new equipment, your workforce will also need training in short interval control, efficient meetings and reporting systems. This will help to ensure the sustainability of the monitoring of your energy consumption and support the maintenance routines and the decision making process.

- Make optimised rebuild/replace decisions

The availability and necessity of new equipment needs to be checked on a regular basis. Any investment decision can then be made on the basis of the measured consumption. In the

steam boiler example, the investment in a new boiler and the optimisation of the distribution grid will save around €50,000 /year (165,000 m³ natural gas). At current energy price levels, the payback period will be around 2.5 years. And with increasing price levels, it will be much shorter.

Practical steps Positive Solutions

Every organisation can save energy and add value by conducting regular energy audits, implementing capacity planning, optimising roles and responsibilities and capturing and standardising best practices.

Energy procurement alliances and negotiations with your energy supplier can further reduce your bill (In our example, a reduction of the energy price by 0.09 cent/kWh will result in €8000 per year savings).

Financial Services, Telecoms, Utilities & Infrastructure organisations can also make further savings with a combination of:

- **Innovative techniques** - the remote cut-off of air conditioning in unused meeting rooms, the installation of office lighting sensors etc
- **GreenIT** - automatic standby of computers, screens with LED Technology, dynamic server cooling etc will reduce the energy bill up to 50%
- **Smart Metering** - identifying and subsequently eliminating load peaks

Further down the line, the production of energy, e.g. biomass energy, combined heat and power plants, wind power and photovoltaic, can result in independence from your energy supplier. What's more, these opportunities are often state-aided and help to reduce payback periods.

GreenProduction is a challenge and a real opportunity. Implementing it creates the framework for cost and consumption transparency. When monitored and controlled, this in turn creates tremendous value by strengthening a company's competitiveness, improving the environment and creating a 'clean' image for customers, employees and society. ■

