Position Paper

Leading in Energy Efficiency

The Opportunity for Manufacturers

Companies that proactively integrate energy efficiency into their business plans will come out on top, while those who choose not to pursue energy efficiency as a priority will likely struggle and fall behind. This paper looks at power in a globalized world, the challenges and the opportunities, and what needs to happen for European manufacturers to win this race.

EATON
Powering Business Worldwide

The Opportunity for Manufacturers

Despite weak economic growth, industrial electricity prices continued to increase between 2008 and 2012 in most EU Member States, driven primarily by rising network costs and government taxes and levies to finance the expansion of renewables.

Electricity prices for European businesses are projected to remain the highest amongst the major industrialized countries by 2035, increasing by an average of 24 per cent, according to the IEA's New Policies Scenario of the World Energy Outlook 2013.

Despite the relative success of European industry in increasing energy efficiency, improvements in energy intensity have not been large enough to compensate for the competitiveness gap created by energy price increases.

The resulting increase in costs is exacerbated by the prohibitively high cost of adding to energy capacity, geopolitical and market uncertainty as well as compliance with anticipated EU regulation around energy efficiency. As a result, manufacturing companies that fail to control their energy costs will get left behind in the global race.

When discussing energy, the focus is often on increased supply and generation through the expansion of energy sources and changing the energy mix. However for many industrial companies the area they can have a real impact is in usage, where costs and environmental impact can be significantly reduced with the right mix of technology and investment.

Anyone not protecting their business through investment in energy efficiency will not only fail to comply with increasing EU regulation and to cut their carbon footprint, they will struggle to maintain their reputation and stay competitive.

Manufacturers face a range of challenges in their competitive landscape, but they also have enormous opportunity to achieve sustainable cost bases. Companies that adapt will have the freedom to increase investment in innovation and new technologies. Companies that have lowered their cost bases and freed up operating expenditure also have the flexibility to exploit new trends and opportunities. The proactive management of energy efficiency has a critical role to play in achieving this.

This paper looks at power in a globalized world, the challenges and the opportunities, and what needs to happen for European manufacturers to win this race.

Summary of Findings

- Adding additional energy capacity is a false economy for companies seeking to improve their profits. Reducing costs through increased energy efficiency is a more cost effective, affordable and sustainable route to improved profits
- The range of proposed EU legislation means that energy efficiency is becoming mandatory rather than optional. But profitability and long-term growth will depend not only on compliance, but on going beyond regulatory requirements regarding reducing consumption and improving efficiency. As high energy users, the manufacturing industry has a key role to play in helping the EU meet its energy efficiency targets. Companies that proactively reduce their energy use and improve efficiency will stand a better chance of survival.
- Companies must embed energy efficiency in their business plans. A greater diversity of financial support is needed for investment in energy efficiency to have a real impact
- Companies that are successful in reducing their energy bills will be able to improve profitability, be better positioned to deliver consistent rates of growth and add greater value to their customers.

Power in a Globalised World

Globalization and the easy movement of capital, goods and services mean Europe is facing ever intensifying competition. The greatest challenge comes from developing markets that are able to compete with lower costs and highly skilled workforces. This challenge is especially true in the manufacturing and process sectors where high energy costs form a large part of a company's cost base.

Despite a slowdown in China, developing and emerging industrialized economies are far outperforming mature industrialized economies. Amongst industrialized economies North America continues to outperform Europe[1].

Globalization has opened new opportunities to industrialized nations that traditionally traded amongst or within themselves. As the movement of manufactured physical goods around the world is now fundamental to the global economy, these "new markets" are no longer just a source of revenue, but also a source of competition.

"Green tape" – a hindrance to growth?

In Europe both EU and national-level legislation is increasingly targeting energy efficiency. However, as Europe experiences a mixed return to growth and access to finance remains a challenge for manufacturers, there is a real danger that regulation may add costs that outweigh the benefits of energy efficiency.

The UN climate talks at the 2015 Paris Summit will produce an agreement for international action on climate change. EU and European countries are meanwhile working moving forward with their own domestic solutions. While gas will continue to play a big part in Europe's energy mix there will be an ever growing emphasis on low carbon and renewable sources of energy; the costs of which will be passed onto industry and their customers - albeit with varying levels of subsidy from governments.

For the energy generation industry and governments, the solution to rising demand is often focussed on increased supply and generation. After all, why would energy producers want a government to pursue policies that would diminish the sale of their product?

Nevertheless, for many industrial companies the area where they can have a real impact is in managing their energy usage.

The most successful companies will not only be looking for the best energy deals on the market but will also be looking at ways of cutting their energy usage and, therefore, costs overall[2].

Companies that are successful in reducing their energy bills will be able to improve profitability, be better positioned to deliver consistent rates of growth and add greater value to their customers.

Conversely, businesses that are not protecting themselves through investment in energy efficiency will not be compliant with EU legislation, fail to cut their carbon footprints and ultimately struggle to compete globally and to survive.

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[1] United Nations Industrial Development Organization,. *World Manufacturing Production*. United Nations Industrial Development Organization, 2015. http://www.unido.org//fileadmin/user_media/Publications/Research_and_statistics/Branch_publications/Research_and_Policy/Files/Reports/World_Manufacturing_Production_Reports/STA_Report_on_Quarterly_production_2015Q1.pdf

[2] EEF,. 'Business Productivity And Energy Efficiency'. N.p., 2015. Web. 6 July 2015. http://www.eef.org.uk/resources-and-knowledge/research-and-intelligence/industry-reports/business-productivity-and-energy-efficiency-in-partnership-with-npower

Meeting the Challenges and Seizing the Opportunities in a Rising-cost Environment

Global scientific consensus and political discourse at the international level is aimed at achieving zero carbon targets by the end of the century if we are to keep global warming to less than two degrees centigrade[3].

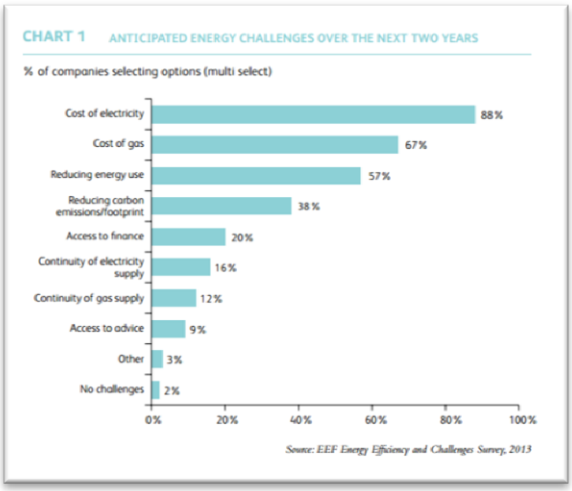
The focus on meeting increasing demand in a way that is affordable, secure and environmentally friendly – the so-called 'energy trilemma' - overlooks the role that reducing energy consumption through increased energy efficiency can play.

As an intensive energy user, manufacturing is an important link in meeting consumer demand as well as helping to meet environmental targets. However, there are a number of challenges which, if dealt with correctly, can be turned into opportunities that will have benefits that go far beyond individual companies' profit margins.

Rising Energy Prices

Despite oil prices being at a current low, the cost of global energy is expected to rise. Fossil fuel prices are particularly volatile and gas prices are subject to similar supply and demand fluctuations as oil.

Industry consumes 25.6 per cent of final energy and 36.02 per cent of electricity in Europe[4] and 7.2 per cent of global electricity use goes into driving factory motors in Europe. This means that rising prices and price fluctuations can hit European manufacturers particularly hard[5]. For energy-intensive industries, reducing their energy use is an effective way of protecting businesses against volatile costs and limiting their exposure to such risk which not only affects their own operations but has an impact on the supply chain as well.



Leading the Way for Energy Efficient Manufacturing

When analysing the environment in which manufacturers operate, it is clear that through savings of up to 30% of energy costs, energy efficiency is the key for those who want to not just survive but thrive in a high cost environment.

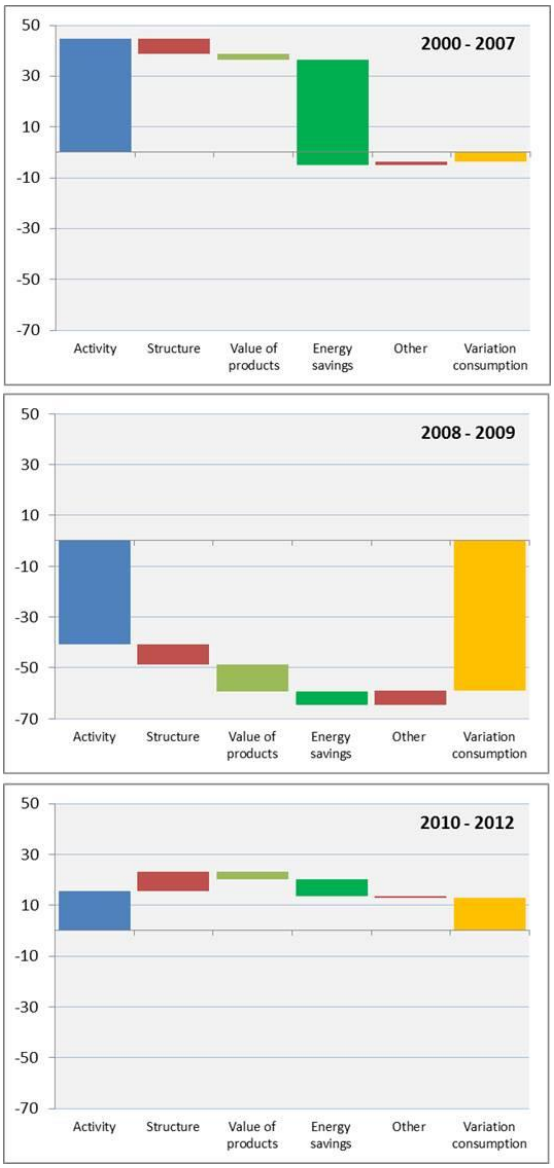
Figures from the Odyssee-Mure[6] project clearly show that whilst there was a significant drop in energy consumption up until 2008, 2009's performance was due to a drop in activity during the recession. Industrial growth since 2010 has led to a lower level of energy intensity improvement and the need to bring energy efficiency actions back to a pre-recession level.

[3] IPCC, "Climate Change 2014: Synthesis Report". N.p., 2015. Web. 6 July 2015. http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf

[4] http://www.eea.europa.eu/data-and-maps/indicators/final-energy-consumption-by-sector-8/assessment-2

[5] Source: Energy Efficiency Policy Opportunities for Electric Motor-Driven Systems, 2011 by IEA, Page 38 http://www.iea.org/publications/freepublications/publication/ee_for_electricsystems.pdf

[6] http://www.odyssee-mure.eu/publications/br/Industry-indicators-brochure.pdf



Decomposition of industry's energy consumption variation. Source: Odyssee

Legislation Means Energy Efficiency Will No Longer be Optional

Germany, Italy and the EU as a whole have been rated as leaders in an energy efficiency ranking of the world's major economies[7], a clear illustration of how the region is prioritizing this issue. In fact, there is an assortment of EU legislation which means that manufacturers must ensure that all new motors used in a wide range of equipment meet strict energy efficiency targets. In addition to this, member states and non-EU countries are adopting their own strategies for improving energy efficiency.

More specifically, the Energy-related Products Directive (ErP Directive) 2009/125/EC is designed to increase energy efficiency by 20 per cent by 2020 and from 1 January 2015 required energy efficient class IE3 for motors from 7.5kW to 375kW. From 1 January 2017 this will include motors from 0.75kW.

In addition to this, many countries across Europe are implementing energy efficiency policies:

- Austria's National Council has voted in favour of legislation to reduce energy consumption by 2020 in line with EU targets
- France has introduced the National Energy Efficiency Action Plan which helps to identify energy savings opportunities for companies and provide state-backed loans to exploit these
- Switzerland is exploring its own private-sector-led initiatives
- Germany's Federal Ministry for Economic Affairs and Energy has introduced a range of incentives to manufacturers from consulting services to subsidies, and even has the Energiewende, a central policy document, which outlines various energy efficiency objectives for 2050

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It is for individual companies and industries, however, to take the lead on embedding energy efficiency within their business models.

Legislation will not help businesses who don't make the investment and get left behind."

[7] Aceee.org,. 'The International Energy Efficiency Scorecard | ACEEE'. N.p., 2015. Web. 6 July 2015. http://aceee.org/portal/national-policy/international-scorecard

As evidenced by these policies, there are a range of regulations, especially in Western Europe, as well as incentives to ensure that industry is meeting energy efficiency requirements. However, the central question is: **Are these incentives enough and can more be done to promote them and help industry to take advantage of them?**

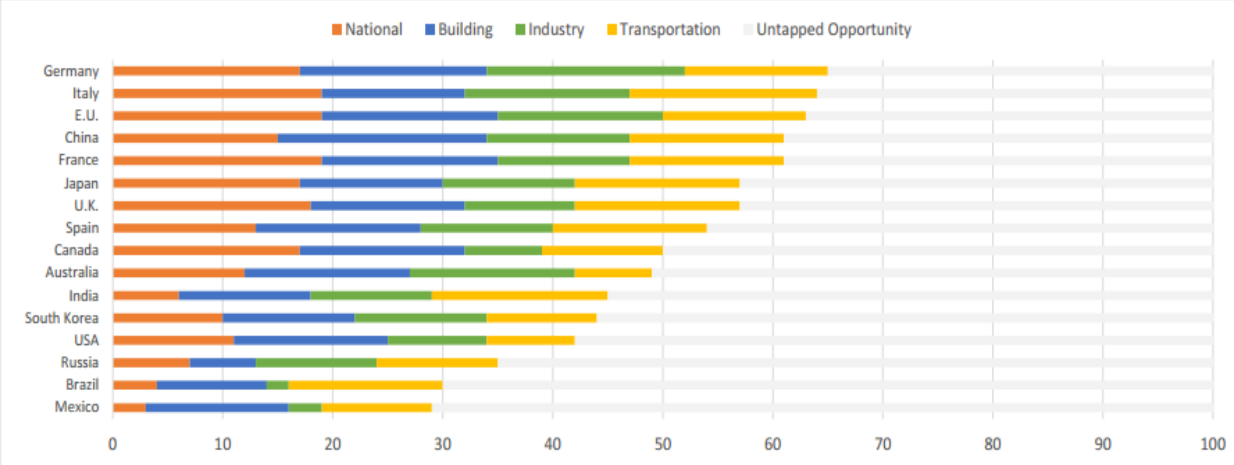
The best results are achieved when industry and government work together on common goals. This collaboration ensures that both parties are committed to success and are willing to invest in solutions whereas if the private sector is obligated to adhere to legislation there may be compliance but likely a lack of innovation.

In the long-term, governments will set the direction and the framework for the enforcement of energy efficiency. It is for individual companies and industries, however, to take the lead on embedding energy efficiency within their business models. Legislation will not help businesses who don't make the investment and get left behind.

The diagram below from the 2014 international Energy Efficiency Scorecard shows European countries are leading on energy efficiency with Germany the overall leader[8]

The scorecard is based upon 31 metrics divided roughly in half between policies and quantifiable performance to evaluate how efficiently these economies use energy. Examples of policy metrics include the presence of a national energy savings target, fuel economy standards for vehicles, and energy efficiency standards for appliances. The performance metrics are a measure of energy use and provide quantifiable results. Examples of performance metrics include average miles per gallon of on-road passenger vehicles and energy consumed per square foot of floor space in residential buildings. Countries including Germany, Japan, and China are surging ahead. Countries that use energy more efficiently use fewer resources to achieve the same goals, thus reducing costs, preserving valuable natural resources, and gaining a competitive edge over other countries.

> *"The best results are achieved when industry and government work together on common goals."*



[8] Aceee.org,. '2014 International Energy Efficiency Scorecard | ACEEE'. N.p., 2015. Web. 6 July 2015. http://aceee.org/research-report/e1402

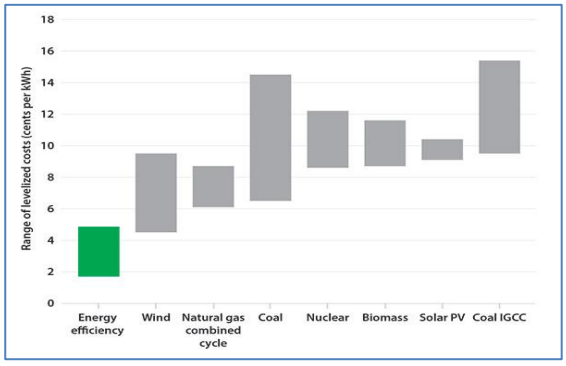
Increasing Energy Capacity with New Generation is a False Economy

As manufacturing companies invest to grow, they face the challenge of adding more energy capacity whilst trying to reducing costs to increase profits.

For energy intensive industries adding energy capacity is a false economy. It is a high-cost solution that ultimately serves to undermine EU energy efficiency targets if not accompanied by technological and process improvements.

According to a report by ACEEE[9], energy efficiency is the cheapest method of providing additional electricity capacity. Energy efficiency programs aimed at reducing energy waste cost utilities only about three cents per kilowatt hour. Generating the same amount of electricity from sources such as fossil fuels can cost two to three times more.

In addition, higher levels of energy efficiency enable national and regional governments the chance to improve their energy independence and reliance on other countries for supply.



Companies with high energy use are exposed to the high and potentially volatile costs of energy. Reducing energy use and improving output through maximising energy efficiency reduces these costs and risks.

Access to Finance

As Europe begins to recover from the debt crisis and return to growth, its GDP growth rate is still far behind that of manufacturing countries such as China and India. Slow growth and constrained finance means that companies are facing serious challenges in securing the financing to invest in their futures.

Governments can play a role in providing support through targeted tax reliefs and other incentives and government-backed loans. However, for the energy efficiency market to truly take-off the private sector must lead.

This has been clearly identified in a recent report by the Energy Efficiency Financial Institution Group (EEFIG)[10]. They see that a historic level of public-private collaboration is required to deliver much higher energy efficiency related investments by 2030 and that public funds need to blend with private sector investment to address the risks and achieve the scale of financing needed.

Companies need to embed energy efficiency in their business plans and private banks need to provide a flexible range of finance options for companies to invest in more energy efficient systems and enjoy increased profits. Such financial products are becoming increasingly available in other sectors such as housing and the industrial sector needs to catch up.

[9] The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs
http://aceee.org/research-report/u1402

[10] Energy Efficiency – the first fuel for the EU Economy: How to drive new finance for energy efficiency investments
http://ec.europa.eu/energy/sites/ener/files/documents/Final%20Report%20EEFIG%20v%209.1%2024022015%20clean%20FINAL%20sent.pdf

Industry can drive the change

Energy efficiency can truly drive profitability by:

1. **Reducing the energy intensity of the processes and equipment utilized such as lighting, motors and machinery**

   An Irish food services company identified that energy savings could be made by replacing the lighting in its cold stores. With a power consumption of just 142W, the LED luminaires chosen, immediately produced an energy saving of 65%[11] compared with the old discharge lighting.

   In addition, they generated much less heat than the 400W HID fittings, so the load on the refrigeration equipment was reduced, which further increased energy savings.

2. **Accessing financing mechanisms and tax incentives to speed up energy efficiency actions**

   Many different systems exist such as the Enhanced Capital Allowance (ECA) scheme in the UK. It is designed to help manufacturing businesses invest in new plant or machinery designed to save energy which might otherwise be considered too expensive. In the first year, allowances allow companies to set 100% of the cost of the assets against taxable profits, meaning the company can write off the cost of the machinery against the business's taxable profits in the financial year the purchase was made.

   Incentives offered by the German Federal Ministry for Economic Affairs and Energy to manufacturing industries:

   - SME Energy Consulting for economically viable measures to shrink their energy footprint.
   - Incentivizing energy-efficient production processes by offering support and subsidies for energy efficient production processes.

3. **Utilizing the energy bill as an asset, using costs saved to repay investments made**

   Energy Performance Contracting is a proven and cost-efficient instrument for tapping existing energy saving potentials in the buildings sector. An Energy Service Company (ESCO) implements a customized energy service package, consisting of planning, building, operation & maintenance, optimization, fuel purchase, (co-) financing and user behaviour.

   The contract between ESCO and building owner contains guarantees for cost savings and takes over financial and technical risks of implementation and operation for the entire project duration of typically 5 to 15 years. The EPC service or main parts of it is paid by realized energy cost savings.

4. **Using freed up energy capacity to extend and expand growth opportunities**

   A real focus has been put on the limiting factor that a site's energy capacity has. To meet the goal of offering EV charging without increasing a garage's electricity demand, the City of Oakland upgraded to high-efficiency lighting with advanced controls that reduced energy use by 45%. Oakland was able to pay for the entire project with its utility cost savings in 2.9 years[12].

5. **Reducing overall operating and maintenance costs by reducing the energy load.**

   As an example, an evaluation[13] of energy saving measures applied to fluorescent lighting in an industrial context calculated that 31 per cent non-energy savings were generated in addition to the direct energy savings. These included reduced maintenance material, reduced maintenance labour, avoided purchase of offsets and reduced sales taxes and environmental penalties.

[11] http://www.cooper-ls.com/resources/case-studies/o-kane-food-services

[12] http://www.abm.com/documents/case-studies/city_of_oakland_mlk_way.pdf

[13] http://www.profitablegreensolutions.com/sites/default/files/resources/media/CORE%20Benefits.pdf

"Less energy usage means companies have more control over their cost base, can improve profitability, enhance their reputation, add greater customer value and are able to invest in future growth. Moreover, the manufacturing sector has a key role to play in helping Europe to meet its carbon reduction requirements."

"Those companies that proactively integrate energy efficiency into their business plans will come out on top, while those who choose not to pursue energy efficiency as a priority will likely struggle and fall behind."