



Can we wake the sleeping giant of energy efficiency?

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A massive resource

The size of the potential prize from improving energy efficiency is now beyond dispute but progress towards exploiting the economically attractive reserves of energy efficiency remains disappointing. Many studies over many years have demonstrated both the scale of the energy efficiency reserves and that, when utilised, they are the lowest cost, cleanest and fastest way of meeting growing demand for energy services, often delaying or avoiding the need to invest in energy supply infrastructure.

In 2008, McKinsey & Company estimated that improving energy efficiency globally by investing \$170 billion a year up to 2020 could reduce the projected growth in global energy demand by half, and deliver half the emissions abatement required to cap atmospheric CO₂ at 450ppm, as well as producing an average Internal Rate of Return of 17% at an oil price of \$50 per barrel. For comparison, investment in renewable energy in 2011 was \$257 billion. Many other studies have highlighted the large economic potential in different countries and sectors.

Rising up the policy agenda

Energy efficiency is rising up the policy agenda in many countries as it is increasingly seen as a vital tool in meeting policy objectives of ensuring energy security, reducing energy costs to consumers, reducing emissions, combating fuel poverty as well as supporting wider economic aims of growth and job creation. The EU has recognised the potential for energy efficiency by including in its 20/20/20 target the objective of reducing primary energy use by 20% compared to projected levels by 2020.

In the UK, the Energy Efficiency Deployment Office has been created within the Department of Energy and Climate Change and was due to publish its strategy by end of 2012. The EU has agreed the Energy Efficiency Directive (EED) in order to help achieve its energy efficiency target. The EED, which should come into force early in 2014, will oblige each member state to set a national energy efficiency target, and energy suppliers to achieve a cumulative end-use energy savings of 1.5% of annual energy sales to final consumers per year. China has an ambitious target of reducing energy intensity by 16% by 2015, which follows achieving a 20% reduction in the five years up to 2010. Many states and cities in the United States are implementing innovative energy efficiency policies and programmes and many other countries including Korea, Singapore and India have also put energy efficiency higher up the agenda. Oil producing countries such as Saudi Arabia, faced with the prospect of rapidly growing domestic energy demand which could see them become net oil importers in the 2030s in a business-as-usual scenario, are recognising the need to implement policies to improve energy efficiency.



Waking the sleeping giant

Given the size of the under-utilised cost effective reserves of energy efficiency, the big question facing policy makers and practitioners is how to massively scale up investment in energy efficiency. In the words of German Chancellor Angela Merkel, “we need to wake up the sleeping giant of energy efficiency”. Doing this will require systematic and coherent policies aimed at increasing in all sectors: demand for energy efficiency, supply of energy efficiency products and services and availability of financing for energy efficiency investment. Work is also required on improving the measurement of results, both at the macro level of energy intensity and within individual sectors. In particular, how do we measure investment in energy efficiency, when many improvements come from investment in new buildings or processes that are not driven by efficiency alone? We can measure investment in renewable energy reliably, but we cannot measure investment in energy efficiency so easily.

Increasing demand

Increasing demand for energy efficiency requires a sectoral approach and a sound approach to market segmentation. Energy professionals often work on market classification rather than really understanding the motivations and requirements of each market segment. In the residential sector, many consumers are concerned about high energy prices but energy efficiency is not seen as a desirable or tangible good and demand remains low. Even when major retrofit work can be financed with net savings, it is hard to get consumers to sign up as the works involved can be disruptive and the hassle factor is high. In the commercial office market, there are a number of barriers including: the well-known split incentive between landlords and tenants, the fact that many owners only hold properties for short periods, commercial mortgage providers not allowing additional debt to be taken on, and the uncertain effect of improved energy efficiency on property valuation – something the United States seems closer to recognising than Europe.

In the building sector, regulations have a large part to play in driving demand. The EU EED will require member states to develop a national strategy for buildings and refurbish 3% of the total floor area occupied by public bodies per annum. The UK's



2011 Energy Act outlaws the letting of F and G rated residential and commercial properties no later than April 2018. Landlords of all types will need to assess the impact of this measure and take action. Display Energy Certificates are a useful driver but are currently only mandatory in the UK for public buildings and not commercial buildings.

The problems of growing demand in the industry, transport and energy sectors also need to be addressed.

Increasing and improving supply

Looking at the supply side of energy efficiency markets there is an urgent need to increase capacity in the key areas of integrative, or whole system, design techniques and Measurement & Verification (M&V). Examples such as the Empire State Building, where 38% savings were achieved with a 3.1 year payback on the marginal cost, compared to a conventionally-designed refurbishment project, demonstrate how powerful integrative design can be, especially when applied at the right time in the building refurbishment cycle. Integrative design is not yet widely understood by clients or designers, nor is it widely taught in engineering courses. The use of traditional design techniques is hard to change due to conservatism and reward structures that incentivise capital expenditure and not efficiency.

M&V, the systematic measurement of energy savings, has often been neglected but must become normal practice. The use of M&V



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markets. Barriers to financing energy efficiency include: the complexity of contracts, transaction costs, the small size of individual investments, lack of familiarity with energy efficiency amongst investors, and the application of inappropriate structures such as private equity models whereas returns are more akin to debt. The big questions are: how to create structures that address investor concerns over risk and provide appropriate returns, and how to aggregate projects which individually are very small by the standards of institutional investors? If these issues can be resolved money will flow. In the United States there has been a flowering of innovation around energy efficiency financing with schemes such as Property Assessed Clean Energy (PACE), which is now being applied to the commercial market as its use in the residential market has been stopped by a controversial and still under challenge decision by the Federal Housing Finance Agency, On Bill Repayment (OBR) and Managed Energy Services Agreements (MESAs). Innovation in financing has been supported by stimulus funds but now the emphasis is switching to accessing private funds. Even in the United States, the finance market at only about \$5 billion is still tiny and individual programmes are too small to attract the interest of large Wall Street banks, although that is changing.

The UK has launched the Green Deal, which, although it has its problems, is an ambitious attempt to launch a large scale energy efficiency financing programme. London has successfully launched the RE:FIT scheme and other cities including Cambridge are launching regional building retrofit programmes with ambitious carbon reduction objectives. Australia, Singapore and the Emirates all have, or are considering launching, energy efficiency finance schemes. We do have to remember, however, that simply providing finance does not make people buy things. The availability of finance is an enabler. Schemes that provide finance also need to address the issues of demand creation and supply side capacity constraints if they are to be successful.

The need for stable policies and addressing market failures

Policy makers and practitioners need to understand the specific barriers operating in

each market segment and design policies and programmes to overcome them. In order to grow the demand, supply and financing for energy efficiency, governments need to put in place stable policies and schemes that provide drivers as well as build capacity in all these areas at different levels.

There is also a need to address market failures, particularly in the electricity market which in most jurisdictions fails to recognise the full benefits of

energy efficiency investments, including reduced need to invest in transmission and distribution upgrades.

The potential benefits from greatly scaling up energy efficiency are clear, as are the barriers. The next few years will reveal how successful policy makers and practitioners can be in waking the sleeping giant.

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EI launches Register of Professional Energy Consultants



In 2010, a BSI survey found that only half of the 800 UK organisations that were canvassed rated their energy management practices as “good” or “very good”. This was despite 78% saying that energy management was either “important” or “very important” to them.

The desire to engage in energy efficiency might be quite strong within organisations, but there is a notable shortfall in actual delivery. What businesses most need at such times of financial squeeze is quality advice on the immediate measures it can take towards energy efficiency, followed by a strategic long-term investment plan for the future.

Even skilled Chartered Energy Managers within the most ‘switched on’ organisations will experience times when a project requires outside expertise. They will turn to a skilled energy consultant, usually with long experience and a high level of qualification behind them. They do this because they are often looking to justify a large scale project of investment for the future and will need to present their board with a compelling and valid case.

The Energy Institute (EI) and the Energy Services and Technology Association (ESTA) have combined forces to identify the best way for consumers of commercial energy advice to find high quality, trusted consultants that have the necessary breadth and depth of expertise to tackle their most challenging energy efficiency problems.

The result is the Register of Professional Energy

Consultants (RPEC), which goes far beyond measuring competence against one specific product or service, and which will deliver results in all business sectors that use energy: buildings, industry and

transport.

The skills required of an energy consultant extend not only to auditing, but to the whole function of metering, monitoring and targeting, identifying suitable solutions and overseeing the correct implementation of such solutions.

The skills that RPEC consultants hold include all aspects of energy management, energy engineering and energy technology, as well as the ability to compile strong justification for their recommendations. They will assist not only in making an organisation more energy efficient but also in tackling emissions targets, ensuring compliance with current and upcoming legislation from the UK and Europe. They will establish plans for the future, ensuring that the relevant skills can be found within the organisation to achieve a continuously effective service that saves their client money.

The minimum requirement of those wishing to join RPEC is Chartered status (ie, degree level or equivalent qualification, usually in engineering, science or technology) and several years’ experience. In the coming months, the service will become available from a free-to-access database that any energy user can search, together with a more tailored service for specialist requests for help.

For more information visit:
www.energyinst.org/rpec