

## **Waking the sleeping giant of energy efficiency**

Energy efficiency can play a major role in addressing the multiple challenges of improving energy security, reducing the environmental impacts and reducing costs to consumers, as well as creating economic growth and jobs. We need to urgently develop the tools to wake up, what Angela Merkel recently referred to as, “the sleeping giant”.

The German Prime Minister’s reference has prompted the question how do we significantly scale-up energy efficiency?

A scale-up of energy efficiency deployment requires an increase in demand, supply of products and services, and availability of financing. These preconditions need to occur across all sectors of the economy.

Many companies in heavy industry claim they have invested in as much energy efficiency as they can because of the high costs associated with efficiency. However, opportunities still remain, both in retrofit and major process change.

In commercial transport there is a demand for greater energy efficiency but the main constraint is the equipment replacement cycle as energy use is largely locked in by vehicle choice.

There is a lot of variation in demand in the commerce industry with large retailers typically carrying programmes that have produced good investment returns for many years. In smaller organisations there is a latent demand for energy efficiency but the constraints are more around lack of capacity.

However, there is increasing *recognition* in non-domestic buildings of the potential to holistically retrofit buildings in a way that can produce energy savings of 30-80% but still little *demand*. The Empire State Building, where savings of 38% were achieved with a three year payback period on the marginal capex has shown the art of the possible. Constraints include the well-known split of landlords’ and tenants’ incentives, the nature of commercial property financing and short term investor behaviour.

Across all organisations there is a need to increase knowledge amongst decision makers as many opportunities to improve energy efficiency are still being missed because clients don’t know what can be done. Capacity and knowledge needs to be built from the board, through energy managers and down to the shop floor.

Unfortunately, housing demand is a more difficult issue. The Green Deal has a target of retrofitting 14million homes, which implies a massive increase in demand for energy efficiency. Although most householders would prefer lower energy bills this is not the same as demanding an energy-efficiency retrofit. A retrofit implies disruption equivalent to having

a major extension. Energy efficiency is abstract and unlike an extension it is hard to enjoy or display. Very few people wake up and think of buying some energy efficiency, they are more likely to wake up and think of buying an object of desire such as a new car or a new computer. Making efficiency desirable is particularly difficult because of the level of disengagement that consumers have from their energy bills and suppliers, with bills largely seen as another form of unavoidable taxation.

The other aspect of demand for energy efficiency in households is behavioural change. Opower, a customer engagement platform for the utility industry, has produced measurable savings by giving consumers information about their own energy use compared to their neighbours usage, so called "neighbour power". Onzo, a data and analytics service for utilities, has technology that can provide consumption data for individual appliances as well as the whole house. Impressive savings and reduction in peak loads have been achieved with this approach.

On the supply side we need to build capacity in several areas, particularly measurement and verification of savings (M&V), integrative design techniques, and supply of financing products. M&V should be an essential element of all energy efficiency projects. The Empire State Building retrofit has shown the power of integrative design but these design techniques are still not widely used. Traditional component rather than system engineering design techniques are still the norm in practice and classroom. We need to increase the supply of architects and engineers trained in integrative design techniques.

Financing for cars does not make people buy cars, and the same is true for energy efficiency. It does, however, enable them to overcome the barrier of upfront cost. Many different designs of energy efficiency financing techniques exist and in the USA there has been a flowering of innovation. Even in the US, however, the market remains tiny (c.\$5bn) and not widely recognised by the financial sector. Only standardisation, such as we saw develop in the renewables industry, can lead to a mass finance market.

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