

Energy for Europe: Fuelling Growth

Most people take energy for granted. Until they find themselves without it or there is some awful catastrophe like the Gulf of Mexico oil leak. Keeping the lights on, cars running, planes flying are the obvious evidence that supply is maintained. Yet the full significance of energy for our economy and society can only be made clear through the negative impact of a power outage or cut in supply.

I suspect it follows that the importance of energy for economic recovery and future growth in Europe may not be fully appreciated by the public. However it does not take too much thought to figure out a list of energy sectors and some of the ways that change and development within them can have a major impact. In fact, I felt quite encouraged by the prospects as I compiled my list.

My starting point is the answer I received to a question put to officials in the Sydney stock exchange early in 2009 when the economic outlook worldwide seemed pretty gloomy. What will be the driver sector for recovery, I asked. Quick as a flash came the answer, green technology. This would be music to the ears of my green friends, and, possibly, sound hopelessly optimistic to industry figures, hard-headed engineers and cynics. Yet, I am sure it is part of the answer to our energy needs and a sector with considerable potential for jobs and wealth creation, albeit quite expensive in the short term.

I should say for me green technology in the energy business means renewable energy and that comprises a wide range of specific technologies at varying stages of development. Hydro-electricity is the most developed for the longest time and there is a school of thought that believes we have exploited the potential in Europe to the full. Yet I believe there are still ways we can go further.

In the age of feed in tariffs I see a future for micro hydro plants which do not require a big head of water of the scale needed for large dams yet once installed can sit there trickle feeding electricity into the grid. I also see potential for greater utilisation in the proposal for an interconnector between Norway and the UK for surplus hydro-electricity exported from Scandinavia with another potential application I will come onto in a moment. Both of these will require significant investment and provide jobs in the shorter term.

Wind energy is widely favoured and fashionable in renewable energy circles. It certainly has the potential to create many jobs and absorb a lot of investment, in particular in the offshore sector where some pretty large structures will be needed in, for example, the North Sea. I mention that because the spin-off from the interconnector project mentioned above would be to provide a transmission line to bring the wind driven electricity ashore and make slightly better economic sense to the concept of offshore wind. When I say big one has to bear in mind the aero generators on land can rise to 140 metres above ground level and the North Sea is up to 200 metres deep, in very round figures, as well as being a very demanding environment for fixed structures.

Quite a few people, including within the European Commission, are talking up the potential of the Desertec project. This is to build a thermal solar power station in North Africa, where there is quite a lot of sunshine, and then transmit the electricity via high voltage cables across the Mediterranean to Italy and Spain. Thermal solar means concentrating heat from the sun into a boiler to produce steam to drive turbines. The engineering challenges involved are considerable but not insuperable, the capital investment required is also large, but even allowing for big transmission losses, the potential level of electricity supply is very attractive. I gloss over the thought that we could be substituting one form of import dependency, gas, for another because I believe this trade would be good for North Africa as well as Europe.

At the moment opinion seems to be favouring biomass as the best prospect for renewable energy whether it is for direct conversion to electricity by thermal power plant or conversion into fuel for cars and trucks. Whether this will really turn out to be a win win situation in providing both the answer to the CAP and loads of renewable energy seems to depend on how fast second generation technologies can be developed and deployed as well as the assumption that the tropics will not be stripped of native flora in general and palms in particular. Subject to these ifs there is significant potential for job creation and need for investment capital to achieve viable economies of scale.

There are of course other renewable technologies such as tidal and wave power which have further to go before they can be considered mature and reliable but there are plenty of projects in hand seeking to demonstrate they have the answers.

I turn to what is sometimes described as the low hanging fruit of energy policy and that is conservation and efficiency, i.e. using less energy in absolute terms and using it more efficiently to achieve a greater output for a given amount of fuel. There are efficiencies to be achieved at all stages of the power cycle from generation through distribution to consumption. If people were really convinced that we need to do much more in both respects there could be huge savings, up to 20% according to the European Commission. A crude measure of what has been achieved is the energy intensity indicator which shows how much energy is consumed per unit of gdp output. Using 1990 as a base year index figure of 100 gdp in Europe has risen to 136, energy consumption has risen to 112 and yet intensity fallen to 82 ½ by 2005. Of course we are still increasing our use of energy so the achievement of lowering energy intensity is not as good as if we could maintain gdp growth with nil increase in energy consumption but the point is that gains have been achieved.

Yet the frustrating thing is that wherever one looks there are more gains to be made. In electricity generation far too much heat is wasted, even with combined cycle gas turbines, but the technical advances in design are moving faster than existing plant is ageing so operators are reluctant to invest in replacements until they reach a full life cycle usage and can avoid stranded assets. Likewise transmission and distribution losses could be reduced with new design cables and the introduction of so-called smart or super grid management.

The switch to smart metering is another area for potential gains in efficiency and cuts in consumption but it all takes quite a long time to replace tens of millions of meters in peoples' homes. In Italy it took five years to change meters and that seems

impressively fast to me. The point about smart meters is to show people what they are consuming and what changes in their pattern of use, or, for example, the introduction of insulation and low energy light bulbs can do to their energy bills. All of this involves huge business opportunities as well as being a driver for innovation. The other driver, of course, is rising energy bills, perhaps the simplest and most effective incentive to strive for conservation and efficiency.

I am running out of space but must mention three sectors of the energy industry with strong growth potential. The first is gas. We are heavily dependant on gas in Europe. We import it from Russia, Norway, North Africa and the Middle East, especially LNG from Qatar. The Netherlands and the UK are still significant producers but over 60% of consumption is imported. There are a number of areas where investment is needed and jobs created. First, in building new pipelines west from Russia and south from Norway, as well as necessary work on interconnectors and reverse flow machinery. This is to improve the capacity of the gas transmission network to adapt to supply shortages in one part of Europe or another whether they are caused by Russia turning off the tap or by a tanker being delayed in transit from the Gulf by bad weather, or maybe, pirates from Somalia. Second, in building LNG terminals around the edges of Europe to convert the liquefied gas back into gas and insert into the system. And third, more in prospect over the coming years than right now, is the exploration of possible deposits of shale gas from which so-called unconventional gas can be produced. In the USA this form of gas has meant the end, for the time being, of their dependence on imported gas.

Until relatively recently coal has been a sector in decline for environmental and cost reasons. The arrival of climate change as a priority issue has changed that perception. The proposals for up to twelve demonstration plants with carbon capture and storage (CCS) capability holds out the promise of a new lease of life for coal. If the technology can be shown to be viable there is a big potential both within the EU and the wider world to build a lot of plants. A cautionary note, however, because the promise of clean coal technology or using coal more efficiently has remained just that, a promise, for a very long time, and the cost of a CCS plant is nowadays put at a billion euro or more.

Finally I have to mention the renaissance of nuclear energy in Europe. Country after country has been realising that nuclear electricity is an essential part of the energy mix and therefore the necessity of replacing ageing plants and even increasing capacity. It takes a long time and a lot of capital to build a nuclear power station, between ten and fifteen years and three to four billion euro or more, but once on stream it will produce volume base-load electricity for 30 to 50 years.

It seems to me that this list, incomplete though it may be, gives a good idea of the scale of work and investment at stake and why it should be a significant part of Europe's economic recovery and future growth.