

No room for biomass

The Government is consulting on a UK renewable energy strategy. But the massive shift to biomass and wind implied by the consultation is not attainable. The carbon emissions required to source sufficient wood or other biomass fuels are dramatically underestimated. The offshore wind target is heroic.

Government sees biomass as a vital contributor to renewables. Even if there were a mass transfer of all UK agricultural land to forest or other biomass sources - a massive upheaval for the whole farming industry entailing a shift to greater food imports - this would still require recourse to foreign sources of biomass supply. The Strategy aims at the UK becoming “less dependent on imports of fuel from abroad” and is thus self contradictory.

The Consultation says that the policy framework must be cost-effective. Yet according to the Government’s own figures, the cost to the UK will be net £61bn by 2030 after taking into account carbon benefits. The framework will drive up energy prices, food prices and inflation. The Strategy itself predicts Government-induced increases in gas bills of 18% to 37% for domestic and 24% to 49% for industrial customers. More households - perhaps millions - will be thrown into fuel poverty.

The consultation talks up the future of wind power, yet this is so intermittent that virtually all wind generating capacity will have to be backed up by extra fossil-fuel or nuclear capacity. As the consultation ignores this, the extent to which this would mean new coal power stations with their attendant pollution is not calculated.

The pro-biomass policy conflicts directly with the Air Quality Strategy. It will worsen air quality. Wood smoke produces more small particles, sulphur and nitrogen compounds than diesel emissions. Burning wood emits a range of deadly pollutants not covered by either the Air Quality Strategy or the Clean Air Act 1993 – so the generating stations will be in rural areas, with consequent transmission costs which are not quantified.

In 2006, 1.5% of UK energy came from renewable sources. The Government target is of 15% of energy from renewables by 2020, in line with its commitment to our EU partners. In our view, this is unattainable.

The Consultation Paper shows a 15% contribution to the renewable mix from biomass-fuelled technologies, including biogas; this is equivalent to 39 Terawatt hours (TWh) out of 260TWh. The paper also suggests that biomass/biogas might need to provide around 30% of the UK’s renewable electricity and heat generation.

39TWh is 39,000,000 Megawatt hours. The capacity required (in Megawatts, MW) is arrived at dividing by the number of hours in a year – 8760. This gives a 4,452MW biomass generation requirement. Power stations are not operative 100% of the time; the average safe base load is about 66% of capacity. So to deliver 39TWh needs a 6745MW capacity of biomass generation.

A 20 MW biomass generation plant would require 7,000 hectares which for 10% land use will require land within a 14 km radius of a power plant - 616 sq km. If the land requirements for sourcing all biomass (other than biogas) are comparable, then the land demand to meet the Government's targets is staggering. 6745MW capacity will require a feeder area of 207,746 sq km. Wales is 20,764 sq. km, Scotland 78,722 sq. km and England 130,410 sq. km. So, if the biomass were to be sourced in the UK then an area of feeder stock 10 times the size of Wales, or more than that of England and Wales combined, would be required.

The assumption in the consultation paper is that biomass is carbon neutral; this relies on the biomass delivering itself to the generating plant. (The Government may be thinking of powering it all with autodestructive triffids.) In fact the required number of lorry movements clearly makes biomass in quantity completely unrealistic. Building Research Establishment CO₂ emission figures attributed to wood chips/pellets the relatively low fuel emission factor of 0.025kgCO₂/kWh, to take account of planting, harvesting, sawing up and delivery of this bulky and heavy material. But the BRE paper admits that these estimates are "notional and are not based on detailed assessments." In other words, it's a guess to encourage a supposedly "renewable" energy source. The Government's Biomass Strategy actually says that "for all biomass resources no net emissions during production are assumed;" convenient, but patently absurd.

The consultation paper claims that the UK has the natural resources to fuel an increase on this scale, but also admits that even after making the best possible use of UK-produced biomass resource, including waste, meeting the increased demand will require "sustainable" imports which it does not quantify. This rather undermines the portrayal of biomass as improving the security of energy supply.

The Government also wants an increase in wind power, looking for 4,000 new 3MW wind power stations. If the biomass demands are sourced in the UK, there may not be much room left to site any of them on land. The Consultation foresees a need for 25GW of offshore wind capacity by 2020, too. This would mean installing 10 turbines a day from now to 2020 (utilising the average 60 possible working days per year). This is 10 times the best installation rate achieved anywhere for offshore installation. The UK has just one suitable heavy-lifting barge currently available; it cost £75 million.

What conclusion should business draw from all this nonsense? Caution and reserve is required. Energy businesses will not put all their eggs in one basket, of course; they will continue to invest in reducing emissions from the fossil-fuel generating capacity which clearly has a solid future, and in nuclear power which will evidently have to be an ever-larger energy source. Business should not fall for the hype; Government needs to be told that it has got it wrong. When the Government realises that biomass and wind will be at best marginal, its twin goals of reducing CO₂ emissions and securing energy supply will entail a massive effort on energy efficiency, home insulation and local, CHP, energy production. That is where investment for the future will produce both environmental and financial dividends.

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