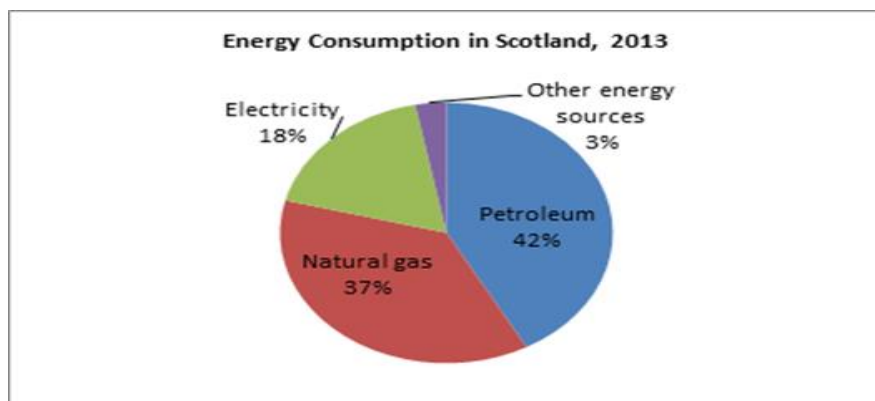


SUBMISSION FROM MACKAY COSULTANTS

May 2015

1. This submission is made in response to the Committee's invitation to submit evidence for the **Security of Supply** inquiry. The remit of that inquiry is "Scotland's energy needs in a changing UK electricity market – an inquiry into security of supply. The four themes will be: supply, demand, the transmission network and market functioning."
2. We give our opinions below on the four themes, with first a few brief general comments. As requested, we have limited our evidence to four A4 pages. However, we previously submitted to the Committee a 125 page report on **Prospects for Scotland's Energy Industries, 2011-20** and will publish an updated version covering the period 2015-24 in the next few weeks.
3. The inquiry is concerned with the electricity industry in Scotland, although that is not immediately clear from the remit. As we have pointed out on various occasions in the past, the electricity industry is only one component of the energy industry in Scotland, although the Scottish Government clearly regards it as the most important.
4. Detailed statistics for 2014 are not yet available but those for 2013 show that petroleum products accounted for 42% of energy consumption in Scotland, natural gas 37%, electricity 18% and other energy sources 3%. Those statistics are illustrated in the pie chart below.



5. The residential sector accounted for 34% of energy demand (total final consumption) in Scotland in 2013, transport 33%, industry 14% and services 12%. These percentages are unlikely to change significantly in the near future.
6. Most of the demand from the residential/domestic sector is for gas for heating, with a smaller amount for electricity. The transport demand is virtually entirely for liquid petroleum fuels, notably petrol and diesel. Demand from the other sectors is for a mixture of oil, gas and electricity.
7. Energy demand/consumption in Scotland has actually fallen in recent years, mainly because of the impact of energy efficiency and conservation measures.

Some of those policies were introduced by the Scottish Government. Other impacts on demand have included high oil prices.

8. This downward trend is quite common in developed countries, notably in the European Union (EU), as shown by statistics from the International Energy Agency (IEA) and other bodies. The rate of decline in Scotland has been similar with those in the UK as a whole, Germany and Scandinavian countries.

Supply

9. The Terms of Reference pose two specific questions;
 - What role will new generation that is under construction or has been consented play?
 - What does “a largely decarbonised electricity system by 2030” mean in practice, and are there sufficient tools in place to bridge the move from fossil fuels to renewables?
10. The inquiry is concerned with electricity supply. As mentioned above, electricity only accounts for about 18% of energy demand in Scotland and 6% of energy supply. However, electricity appears to be the main priority of the Scottish Government.
11. The Government wants to maximise the contribution of renewable energy to electricity generation in Scotland, from sources such as onshore and offshore wind farms, marine energy and hydro schemes. Renewable energy output, particularly onshore wind, has increased substantially in recent years and that is expected to continue in the near future.
12. However, there have been setbacks with both marine energy and offshore wind farms. Their future contributions may be significantly less than the Scottish Government’s predictions.
13. In any case, a large proportion of electricity supply in Scotland is currently provided by the two nuclear power stations at Hunterston and Torness, the gas-fired station at Peterhead and the coal-fired station at Longannet. These plants are particularly important in providing the base load supply, as well as during periods when the supply from wind farms is low.
14. Mackay Consultants believe strongly that there is a need to replace these power stations with similar plants when they are closed down. We do not believe that renewable energy supplies will be sufficient to compensate for their loss. If not, our forecasts show that Scotland will have to import electricity from England, Norway or elsewhere.
15. It seems likely that the coal-fired station at Longannet will close in the near future, possibly in 2016, so it would be the first to be replaced. However, the Scottish Government is opposed to a new coal-fired plant because of the CO₂ emissions. Many other countries have adopted similar policies. There were

plans for a new coal-fired power station at Longannet with lower CO₂ emissions but that now seems unlikely to proceed.

16. The closure of the nuclear plants at Hunterston and Torness is probably at least a decade away but we believe that plans to replace that capacity should be implemented as soon as possible. The current Scottish Government is also opposed to new nuclear plants, although there are plans to build some in England.
17. Almost by elimination, the implication is that new base load electricity capacity in Scotland will have to be gas-fired. A new plant of that type could be built at Longannet, which would obviously benefit the local economy.

Demand

18. As mentioned above, energy demand in Scotland has fallen in recent years, including electricity consumption, at an average of about -2% per year. Some of that decline is attributable to the economic recession from 2008 onwards but the two main reasons have been the impacts of high oil prices and of energy efficiency and conservation policies. Similar trends have been evident in the rest of the UK, Germany, Scandinavia and other developed countries.
19. However, we believe that much more could be done in Scotland to increase the beneficial impacts of energy efficiency and conservation policies. Far too much emphasis is given at the present time to the promotion of wind energy.
20. It is relatively easy to forecast peak electricity demand. There is little or no reason to expect it to be higher than in the past, particularly if more effective energy efficiency and conservation policies are pursued.

Transmission network

21. The Terms of Reference refer to “a number of new transmission network projects currently under construction or being planned.” Most of these are for renewable energy supplies, for example from the Western Isles and Shetland Islands to the Scottish mainland.
22. We believe that there is currently too much emphasis on these transmission projects and that the top priority should be to replace base load capacity from Longannet and the two nuclear power stations. That would best be done at Longannet and possibly Hunterston or Torness. New developments there would not have significant implications for the electricity transmission network, although some of the existing services will need to be upgraded.
23. Objective investment appraisals and cost-benefit analyses of the proposed transmission projects should be undertaken. They should result in a ranking of projects which could then be implemented in line with the availability of funds.
24. We believe strongly that the economic and financial analyses undertaken for some of the proposed projects have been very poor and politically motivated. That is particularly true of some of the proposed transmission links between the islands and mainland.

25. If the base load power stations are not replaced, it is likely that Scotland will have to import electricity in the near future. That implies a need for suitable links with England. Plans were recently announced for an underwater electricity cable between Norway and NE England, and Scotland could also benefit from Norwegian imports with the appropriate investments.

Market functioning

26. Finally, the Terms of Reference mention “a number of significant changes to the electricity market” such as the Capacity Mechanism. As economists we are very sceptical about some of these changes.
27. It should be obvious that companies such as Scottish Power and SSE (Scottish and Southern Energy) must be confident of satisfactory financial returns if they are to invest in replacement capacity for Longannet and the nuclear power stations. The present system clearly does not give them that confidence. The current electricity market in Scotland is distorted by a mixture of prices and subsidies, which are in urgent need of rationalisation.
28. Apart from onshore wind farms, there has been very little new investment in the electricity industry. That is in marked contrast with the North Sea oil and gas industry, despite the recent collapse in world oil prices. There is currently about £20 billion investment underway on gas and oil fields in the West of Shetland area, for example, and some of that gas could be used for electricity generation in Scotland.