

ENERGY DEVELOPMENTS IN SOUTH-EAST MEDITERRANEAN

SESSION: ENERGY and RENEWABLES (What will it take for the region to activate its potential?)

SESSION CHAIRMAN'S OPENING REMARKS

1. People do not want energy, they seek modern energy services supplied reliably and efficiently.
2. But efficiency does not necessarily mean technical efficiency. For example, a wind turbine may be at the leading edge of technical efficiency, but due to the intermittency of wind and/or the poor siting of a development (for example, where mean wind speeds are relatively low), the energy service needed or wished for is not reliable and therefore not efficient for users. In this situation we need a different choice of language. Is the modern energy service required or desired being effectively supplied by that source of energy or technology? Here the appropriate issue is the efficacy of a development – does it produce the needed or desired effect? This is a fundamental issue for intermittent sources of energy – for wind, for solar in most higher latitudes, for tidal power. It is too often overlooked by vested interests seeking profitable investments – especially those backed by subsidies, tempted to make exaggerated claims, and/or under pressure to meet unrealistic targets.
3. There are three other fundamental issues or concepts which should also be borne in mind when considering renewable energy sources and their harnessing:
 - the absolute and relative power densities of the source and the technologies used to harness it (recalling the work of Vaclav Smil), where most new renewable energy sources perform poorly against traditional forms;
 - the concept of Energy Return on Energy Invested (EROI – as people such as Charlie Hall, Cutler Cleveland, and Dave Murphy have worked with for up to four decades), where again new renewable energy sources perform poorly although the performance of the fossil fuels has been in decline in recent years on this measure. (1.)
 - the concept of “useful energy” , or how we can best evaluate the energy services that result from the provision of useful energy after it has been converted from primary to secondary forms and then to final energy for use, which highlights waste and the potential for improvement (a field in which Bob Ayres has worked for many years).

Under all three of these headings new renewable energy sources, and the technologies in use and prospective, need to be carefully evaluated. They rarely are.

4. There is a further area where new renewable energy sources and developments need to be carefully considered. Can they have unintended consequences? The most obvious example is biofuels, where first generation use of maize and soya has been regarded as a “crime against humanity” by one senior UN official, and blamed in a major World Bank study for the food price rises and resultant riots in 47 countries in 2008 (and for the 2012 “Arab Spring” in the Maghreb). Great care will need to be taken not only to avoid use of good agricultural land in the South East Mediterranean (as elsewhere) for modern biofuel and biomass developments, which impact on both food and water availability, but also for large solar parks. However, the technical potential for Concentrated Solar Power in the South East

Mediterranean is considerable, and the scope to transmit electricity over large distances using Ultra High Voltage Direct Current Transmission attractive (not least because socio-political uncertainties in North Africa have cast a cloud over the longstanding Desertec concept). Location of many large-scale parabolic mirrors on good quality agricultural land should be avoided. It should also be borne in mind that the level of direct solar irradiation in Greece is highest to the south and east of Athens, which does not appear to offer large areas of land for the optimal location of solar energy facilities!

5. Wind speed atlases for the South East Mediterranean show that over most onshore areas the wind resource is poor. The resource is relatively good offshore, on the islands of the Cyclades and Dodecanese, and on Crete. However, this means that transmission costs to major points of use are likely to be relatively high and the cause of delay in providing the necessary links. The installed wind energy capacity in Greece is approaching 1.8 GW, and that in Turkey some 2.3 GW – the latter helped by EBRD support for two major onshore developments at Osmaniye and Balikesir. But in both countries the expansion of wind energy capacity has faltered against expectations as recently as 2007. In the case of Greece installed capacity was, in mid-2013, little more than half what was being discussed only six years earlier. The recent financial crisis, and widely publicised economic problems which have resulted, are a root cause.
6. There has been some discussion of large-scale solar power plants in Greece and Turkey. For example, there have been talks between Greece and Germany for the past three years or so on whether the latter is willing to give Greece financial support to develop its solar potential. Greece has earmarked 20,000 hectares for solar park developments, but to date there appears to have been little firm action. Interestingly, one scheme under serious consideration would take up 520 hectares (nearly 1,300 acres) over depleted lignite mines at Kozani. One large-scale solar power development, of 100 MW and taking up 2,000 square metres of land, is being actively discussed for a location in southern Turkey. Otherwise solar power in both Greece and Turkey has been confined to small-scale solar PV schemes, domestic or local community facilities, some 90% of their total capacity not linked to the grid. But so far, with close to 2 GW of installed capacity, Greece is well ahead of Turkey in exploiting its solar energy potential. Until recently Turkey has offered few inducements to expand solar energy provision.
7. Although Greece's indebtedness due to subsidising new renewable energy schemes is modest compared to that of Spain (where a number of leading energy specialists – Pedro Prieto and Carlos de Castro among them – have largely apportioned blame for the depth of Spain's economic crisis on the Spanish authorities exposure to providing subsidies for renewable energy developments), there are clearly going to be on-going financial constraints on Greece's capacity to expand its renewable energy contribution to the provision of modern energy services, reduce its carbon emissions, and meet extremely ambitious EU targets for renewable energy and carbon emissions. But then in addition to Spain, there are Italy, Portugal, and the Czech and Slovak Republics which have announced major reductions in, or even the cessation of support for, renewable energy schemes.
8. It is not only on the supply side where financial constraints have been having an impact. Household electricity use has been cut back by many, and supply cut-offs have increased - notably in Greece.

9. But let me draw these remarks to a close with a question for our speakers. We hear much about the installed capacity of wind energy – in Greece, as elsewhere. For example, we hear much about the UK being the windiest country in Europe, with the average capacity factor achieved being 30% within a range of 20% to 50%. Yet the rolling average for onshore wind energy developments in England is 23.6%, and in 2010 nearly 60% of developments failed to achieve a capacity factor of even 20%. These figures are provided by the operators themselves. So, what are the wind energy capacity factors being achieved in Greece, Turkey, and Cyprus?
10. I am confident that with our first two speakers alone representing, respectively, the owner of nearly 20 % of Greece’s installed wind energy capacity [EdF], and the supplier of around 50% of the country’s wind turbines [Vestas], we will be provided with the data. (2.)

Notes:

- (1) Of course renewable energy facilities can supply important services which may not otherwise be available – such as solar lighting for educational or employment purposes after dark (what Jessica Lambert has termed Social Return on Capital Employed).
- (2) We weren’t!