



The question of renewables

With solar power, the grids need power capacity during daylight hours and at night as well. Here is a perfect example of intermittency in which power capacity is available during the day but not at night. In addition to this, photovoltaic cells which are used for solar power are less effective when they become dusty, which is often a problem in the types of climates that lend

is a grid of say 10,000 MW and it has 3,000 MW of wind power there can be swings of power capacity of anywhere from 0 to 3,000 MW coming into the grid and that is a serious amount of swing which becomes very difficult to manage. This creates the issue of managing drops in output. It is difficult to manage the strong surges in wind output when the turbines cut out

part load acceptance characteristics and the ability to be switched off and on when needed. It needs to be granular as the grid will not bring in 350 MW in one go; the grid may need 10, 15, 50 and then 100 MW to be brought on gradually, so part load capability is critical."

IER – "What types of thermal power plants would be most suitable for helping the power grids to manage the intermittency of renewable power?"

RS – "We believe our technology is well suited for this purpose as it has low capital costs per MW, good part load characteristics, and its granular fast-start can bring on 100 MW in less than 30 seconds which is perfect for solving many of wind power's intermittency problems. These problems include extreme storm conditions with high wind speeds which are disastrous for wind power. At high wind speeds, wind turbines switch off their load carrying as the drives are made to disconnect in order to avoid serious damage to the wind power equipment. Wind power



IER speaks to Aggreko plc's Chief Executive, Rupert Soames, about the challenges faced by countries looking to increase their renewable energy capacity.

IER – "What do you believe the global power industry needs to be doing during the next few years in order to lower the levels of CO2 being emitted into the atmosphere from coal fired power plants?"

RS – "Decarbonising power generation will mean that power grids need to have a far higher proportion of renewable energy power capacity in the grid than they currently have. The problem is that with the exception of thermal renewable energy, such as biogas and coal-bed methane, all other forms of renewable energy depend upon natural forces for their own energy needs and therefore have levels of intermittency associated with them. This means that power grids must manage that intermittency to ensure stable levels of electricity in the grid.

The intermittency of hydro tends to be caused by the El Niño and El Niño effect. It is found most often in countries between the Tropic of Cancer and the Tropic of Capricorn which have a wide variety of rainfall over a five-year cycle. This means they go through phases where they haven't had enough rainfall to keep the hydro dams full. This hydropower shortfall may occur every five or six years in some regions where hydro is often the main form of power generation, so they need to bring in additional power to make up the shortfall.

themselves to solar power. With tidal power intermittency occurs between the spring and the neap tides when virtually no tide is running. However wind power is different as the patterns of intermittency are mainly unpredictable. Power utilities can average-out wind availability over a year but when periods of low input coincide with high energy demands, it can be very difficult to manage."

IER – "This intermittency of renewable power is clearly a serious problem for power grids; what do you believe the power utilities can do to alleviate the problem?"

RS – "My own personal view is that wind power becomes really hard to manage above a 10 percent penetration. So if there

for safety. So, the utility must have some thermal generation to smooth the negative impacts of wind power. The utility will aim to run the thermal power as little as possible as thermal power has fuel costs whereas the marginal cost of the wind production is zero. What utilities need is a thermal plant with the following characteristics:

Firstly, a low capital cost per MW because it is going to be running a relatively small amount of time. It will probably have a load factor somewhere around 10 – 20 percent so you cannot afford expensive pieces of capital equipment. Secondly, it has to have fast ramp-up and ramp-down capabilities so it cannot be a gas turbine plant which is kept running all the time for baseload purposes. The back-up plant must have excellent

equipment disconnects when the wind speed is above 35 – 40 knots so they move from full load to no power within seconds as the speed increases. The grid must have back-up power which can start working very quickly. We believe Aggreko is well suited to supply the required back-up power as we have relevant experience as much of our business is already hydropower related.

Grid managers need to have thermal power on hand to manage these intermittencies but not all through the year. Additional thermal power will be needed in peak periods such as during winter when the demand is heavy, so they need to bring in additional load to supplement the wind power. For this back-up power capacity need, temporary power rentals are ideal. In most countries winter peak demands often coincide with periods of very high or low wind speeds where grid managers need to bring in some short term additional power generation when the wind is blowing too strongly or too weakly. Utilities need to plan carefully for the renewable power in their networks as renewable power will be a principle source of power in years to come."

Rupert Soames joined the Board of Aggreko plc as Chief Executive on 1 July 2003. He was formerly with Misys PLC, where he was Chief Executive of the Banking and Securities Division. Before joining Misys, Mr. Soames was with GEC plc for 15 years, working in a number of their subsidiaries; in the last four years of his service with GEC he was responsible for the UK, African and Asian operations of Avery Berkel.

