



Solar-salt plant, Spain

Parsons recently formed an alliance with TSK, headquartered in Gijon, Spain. TSK has pioneered the thermal molten salt application to store solar generated heat and thus extend the solar day. In 2008, TSK spent €310 million (EUR) to build two 50 megawatt thermal solar farms in just 27 months on a 200-hectare plot in Badajoz, Southern Spain.

The process begins by focusing giant parabolic mirrors on a pipe to precisely track and reflect the path of the earth relative to the sun. The heat is captured at a very high concentration, up to 393 degrees Celsius. A thermal fluid (synthetic oil, water or other fluids) is circulated through the pipe to grab that heat and is released in an exchanger. The steam then powers turbine generators and some of the resulting electricity is transmitted to the grid.

“But right now, the toughest trick is our distribution system – the grid,” Brady said. “We can generate power, but we have to get it to the grid and the grid needs to have the capacity to accept and transmit the power – getting there is a real challenge for all of us.”

Thermal solar addresses the very delicate balance between supply and demand versus grid capacity. The excess heat from the solar panels is stored in molten salts and released during non-solar gain hours to provide continuous heat to the steam generating exchangers.

“In Spain, the annual capacity of all of plants range in thousands of megawatts – remember, Spain has been at solar much more ag-

gressively than the US. In fact, most of Europe has,” Brady pointed out. “The irony is, the solar plants in the Extremadura are the best solar fields in Europe, yet only half the potential of the solar fields in California’s Mohave Desert.”

Thermal storage improves the reliability and consistency of the electricity supplied from that particular plant. And since the raw material is abundantly free, the return on investment seems very economical once the plant gets up and heating.

On the other hand, large amounts of real estate is required and capitol cost including thermal storage makes return times taxing. However, with feed in tariffs and other tax incentives such as carbon credits, the economics are very practical.

Back in Spain, together the two Badajoz solar-salt plants generate 100 megawatts at an estimated cost of €5 million per megawatts and requires only 35 to 45 staff to operate normally. That keeps operating costs much lower than conventional power plants. Parsons-TSK has two solar thermal storage plants coming on line summer 2010, and two others in design phase.

According to Brady, “technologies have improved dramatically and thermal solar is sound and proven, but we really need a national strategy and plan implemented to catch up. Certainly it can be looked at as a matter of national security, not just an economic opportunity.”