"The next big step forward for renewables: energy storage!"

So tweeted US legal site J D Supra, leading the reader to a piece detailing a US government agency's 'solicitation' for grants towards developing technologies for storing renewable energy.

The Advanced Research Projects Agency – Energy (ARPA-E) is part of the US Department of Energy and is to make $43m available to small businesses to "...fund the development of transformational technologies that reduce the barriers to mass adoption of electrical energy storage for stationary and transportation applications."

The article, by Daniel Freedman of US law firm Tharpe and Howell, goes on to explain: "With respect to stationary applications the ARPA-E solicitation focuses on storage systems to support electric vehicles and consumer meter applications. As for transportation applications, the ARPA-E solicitation focuses on battery chemistries, battery architectures and novel electric storage systems."

According to Mr Freedman: "Effective and efficient systems for storing renewable energy will allow these abundant natural resources to be further integrated within the overall power grid and energy markets."

Naturally, being the USA the focus just had to be on cars – what else? But the essence of the programme is that in order to move on to the next level of renewable energy production, some way has to be found to make it available.

In this country, Southampton University has developed a way of creating 'virtual power plants' from linked clusters of 'distributed energy resources' (DERs) – small wind, solar and other renewable systems.

According to the researchers: "Although the deployment of DERs could reduce reliance on conventional power plants, their integration into the Grid is problematic since the DERs, given their small size, are largely 'invisible' to the Grid. Even if visible, the uncertainty and uncontrollability of renewable energy sources prevents individual DERs from profitably dealing with the Grid directly, or participating in the wholesale electricity market because they are often unable to meet the set generation targets."

The solution is to link them together virtually to form a larger aggregate supplier.

Dr Valentin Robu, from the Agents, Interaction and Complexity Research Group at the university (I know, but they do a good job), said: "There is considerable talk about how to integrate a large number of small, renewable sources into the grid in a more efficient and cost effective way, as current feed-in tariffs, that simply reward production, are expensive and ineffective.

"CVPPs that together have a higher total production and, crucially, can average out prediction errors, is a promising solution, which does not require expensive additional infrastructure, just intelligent incentives."

The last point refers to the fact that the Grid uses estimates from suppliers to assess the number of power sources it needs at any one time, and the more accurate the estimate, the more useful the Grid finds them.

So there are emerging ways of delivering renewable energy on a large scale, despite what detractors may say.

Chris Stokes