

## ELECTRICAL ENERGY STORAGE - A CRUCIAL ASPECT OF THE ENERGY TRANSITION

Beyond the differences of opinion that have been expressed regarding the energy transition bill, the integration of a greater proportion of renewable energy into the French energy mix has met with widespread agreement in our country. Furthermore, the need to drastically reduce greenhouse gas emissions (and CO<sub>2</sub> in particular), which requires the objective of decreasing our emissions fourfold by 2050 to be met, is now a matter of top priority for the majority of our fellow citizens.

At the same time, this integration of renewable energy must take into account the intermittent manner in which certain forms of renewable energy are produced. A number of approaches can help achieve this, including improving energy efficiency, strengthening networks and even streamlining the methods of consumption permitted by the rise in smart grids.

Electrical energy storage is also an important factor:

- with regard to stationary storage, it is important to avoid losing the energy produced when production is greater than demand and, conversely, to ensure consistency of supply when part of the solar or wind energy generating facilities are not producing. Storage is therefore designed to support the stability of the electricity network;
- with regard to mobility, in order to encourage an increase in the use of electric vehicles, which would appear to be an appropriate way of tackling one of the greatest sources of CO<sub>2</sub> emissions, namely transport, provided, of course, that the electricity used is largely carbon-free.

This opinion reiterates the specific nature of the way in which the French electricity network functions and reviews the various technologies available, their respective levels of maturity and their performance, not forgetting their environmental impact and the current and foreseeable economic conditions

surrounding their development.

### THREE TECHNOLOGICAL OPTIONS AT THE HEART OF THE DEBATE

The ESEC believes there is an urgent need to create the essential dynamic required to ensure that the foreseeable technologies and necessary investment will be available both to support the networks and to meet decentralised needs. Electrical energy storage technologies must be developed as a matter of urgency in order to contribute to the development of carbon-free mobility.

In this respect, our Assembly has noted that the various technologies available have matured to widely varying degrees and that their economic model remains uncertain. Moreover, there does not appear to be any form of technological approach that would be likely to provide a single response to the variety and heterogeneity of the problems presented. Likewise, it is largely premature to categorically claim that such or such approach should be ruled out.

With regard to our country, the ESEC believes that three technological options should now be placed at

the heart of the debate, these being energy transfer pumping stations (STEP - *Station de transfert d'énergie par pompage*), batteries and the hydrogen sector (including *power-to-gas*).



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- Revising economic and financial models for electrical energy storage. It is essential that the price of CO<sub>2</sub> emissions be set to reflect the actual waste they produce. This objective should particularly be borne in mind with regard to work undertaken in the framework of the COP21.
- Creating economic and financial models based on this new information that make it possible to specifically enhance the service provided by the various storage methods.
- Assessing the financial repercussions of the various existing scenarios with regard to changing energy needs, the integration of variable renewable energies, the upgrading of the network and storage needs from this same perspective, as called for in the ESEC's opinion on the energy transition bill.
- Not abandoning any pioneering technologies and acquiring the skills of highly-trained personnel who are therefore capable of rapidly incorporating technological developments.
- Supporting research policies and R&D. The ESEC believes it necessary to lend particular support to research into energy storage and for projects to be monitored and prioritised to ensure that they effectively contribute to achieving the objective of a fourfold reduction.
- Developing both preliminary research and technological research designed to validate new concepts and innovations with a view to bringing them to market and industrialising them.
- Encouraging the creation of innovative SMEs based on cooperation with the research system.
- Acquiring experimental platforms and pooled test resources that would enable the various stakeholders to test theories and make progress in their work without the obstacle of significant investment that would remain under-utilised.
- Encouraging the development of a widespread network of sales support representatives for stationary technologies with the aim of both validating the theoretical results and creating an international showcase for our expertise in activities with a bright global future ahead of them.
- Encouraging industrial cooperation that will facilitate the creation of structured and coherent sectors, along with European cooperation based on a Community strategy, such as in the field of battery manufacturing, for example. The ESEC supports the joint direction taken by France and Germany with the aim of fostering European industrial cooperation in the field.
- Involving all of the stakeholders concerned - the State, manufacturers, associations and unions - in initiating reflection on the recycling of lithium with the aim of fully applying the principle of extended producer responsibility that is now in force where batteries are concerned.
- Underlining the particular importance of storing electrical energy where the overseas territories are concerned (the overseas departments, regions and communities are unconnected territories) and supporting the various experiments aimed at combining storage solutions with the deployment of smart systems for regulating supply and demand (*smart grids*).
- Producing a national and European legal framework that reflects storage specificities and the specificities of considering its mission of general interest, as well as the objective of optimising the electricity and energy system.
- Encouraging authorities and businesses to take storage issues on board.