

## The challenge of integrating renewables

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The overall energy ecosystem is facing an unparallel evolution. On one hand electrical consumption will continue to increase pushed by the global economical growth but also by the growing importance of electricity as energy source in substitution of the traditional fuels. The IEA predicts an increase of world renewables-based electricity generation from 3577 TWh in 2007 to 7640 TWh in 2030 representing an increase by more than 30% of total loads. By 2030, more than 25 % of the electrical supply and 15% of the electrical demand could shift randomly in less than minutes.

However, the integration of large quantities of renewables and new consumption modes raises new technical and economical challenges to the Utilities, Regulator and Consumers:

- How to maintain equilibrium between the supply and demand?
- How to ensure a priority usage of renewable versus other forms of electrical generation?
- How to deal with competitiveness among all electrical generation sources?

ALSTOM Power, at the heart of its “Power Plant Integrator” strategy, offers solutions allowing

- higher flexibility for the traditional “base load” units
- a combined operation of renewables flexible back-up generation (gas) with base load generation (nuclear or coal)
- a cost effective integration of renewables and electrical storage assets located in Urban environment

ALSTOM Power in collaboration with Microsoft has developed a comprehensive set of solutions to ensure a real time management of central or distributed Power generation resources. The ALSPA Series 6, The Alstom Power DCS (Distributed Control System), is open and flexible control architecture for Smart Power. This innovative concept of “Electrical Internet” will allow a smooth integration of the new energy ecosystems.

Power efficiency and flexibility to all players in the Energy Eco-system will be the key to the integration of renewables, and path the way of the “Electrical Internet Revolution”.