

Power electronics, a key technology for the renewable energy system integration

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Abstract:

Efficient and effective network management is the key to the integration of renewables in an efficient way that ensures cost-effectiveness and affordability, security of supply and grid stability. Real time monitoring and optimisation are necessary to increase the flexibility, through solutions such as storage, demand response or flexible generation among others, to integrate higher shares of variable renewable energy and to serve the whole of the EU territory.

Exploiting synergies between electricity, heating and cooling networks, gas networks, transport infrastructure and digital infrastructure will be crucial for enabling the smart, integrated, flexible, green and sustainable operation of the relevant infrastructures. Besides hydrogen and batteries other storage technologies are necessary to create a set of flexibility options. Similarly, integration of local, small, or micro grids raises a challenge at the level of the European energy network.

Using highly efficient power electronics in power generation, power transmission/distribution and end-user application, together with advanced control solutions paves the way for the transition from the conventional and fossil-based energy system to a renewables based one.

Important points of consideration for this transition are flexible generation, grid flexibility (network infrastructures), system stability and flexible operations, energy storage integration, demand side flexibility, advanced planning for flexible systems, innovative market design, business models and regulatory framework, secure digitalised energy system, integrated platforms for management and control of energy assets, effective and efficient solutions for transporting off-shore energy, direct Current grid solutions.

Through system and technology development, European R&I strongly supports increasing the efficiency and effectiveness of the European energy system and help integrating it with its neighbours, accelerating the transition towards renewable energy, which is the key component for the EU to reach its 2050 decarbonisation objective.

**Biography:**

French State Civil Engineer by education, H el ene Chraye graduated then in Economics and in Public Law at Sciences – Po / Paris.

After a stay in the French Administration to build the Energy Observatory and then on State Aids to the industry, she joined the European Commission and worked successively on various domains of the European Transport policy: Inter-modality, Trans-European Networks, Single Sky, as well as dealing with enlargement to 12 new member states.

After a few years as Head of Operations in the EU Delegation to Belarus, Moldova and Ukraine, she joined DG RTD where she built the European Research Council Executive Agency and then managed financially and legally the EU programme NMBP, part of FP7 and H2020. She later on revamped the EU policy on materials and nanotechnologies, also designing the new European system of materials innovation testbeds.

Since 1st June 2019, she is heading the unit in charge of designing and implementing the European Research policy for Clean Energy Transition within the Directorate Clean Planet.