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WHAT THE EXPERTS SAY



Open innovation

A change of mindset in the T&D industry

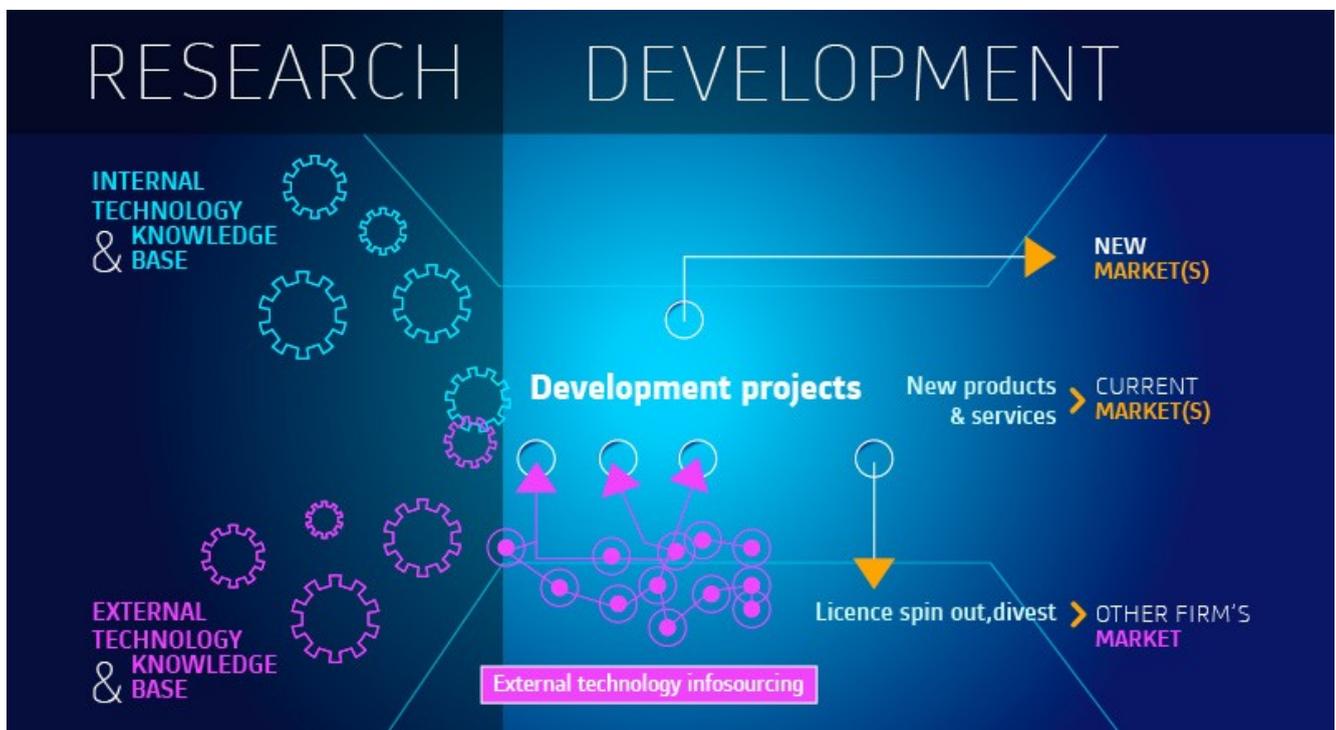
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 HVDC  OPEN INNOVATION  SMART GRIDS
 STORAGE

Think Grid asked some of its R&D experts about a recent phenomenon called "open innovation".



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« Open innovation is a strategic pillar of competitiveness. »

What is open innovation?

Robert Plana, R&D University Relations Director: To quote Professor Henry Chesbrough of the University of Berkeley, “Open innovation (OI) argues that the future belongs to those who do the best job of integrating the best of their internal ideas and capabilities with the best external ideas and capabilities”.

Open innovation is a strategic pillar of competitiveness. It covers the whole innovation cycle, from initial ideas to final product development, following 2 criteria: technology readiness and business readiness. In the early stages, open innovation takes the form of collaboration with universities and research centres to anticipate emerging technologies and new scientific disciplines. In mid cycle (prototype stage), OI is focused on

developing partnerships with start-ups to leverage technologies inside the company by introducing new concepts or processes. Later, OI deals with alliances, joint ventures or strategic partnerships with companies large and small to accelerate product development and target new markets.

What are the main drivers for implementing open innovation in the energy sector?

RP: New issues are arising in the energy sector: a possible rarefaction of fossil resources, a collective awareness of climate change, growing urbanisation and an unpredictable economy. They provoke the need for a more flexible energy sector and one that is closer to citizen expectations. This will create a shift from centralised energy generation to a distributed energy system featuring a broader portfolio of technologies and usages.

A company mainly involved in centralised energy generation will need to expand its technological portfolio, acquire new skills and anticipate the demand for new services. That is the first driver for an OI strategy.

A holistic energy system will require digital technologies as key enablers. These will represent a second driver for OI implementation.

The third driver will be related to a move from a business-to-business market to a business-to-business-to-customer market that will translate into new ways to develop offerings.

How is an open innovation strategy to be implemented?

RP: OI strategy can be multi-form depending on the stage of innovation in the cycle. In the early stage, partnerships with universities and research centres can take the form of professorial chairs through donations, industrial clubs in faculties or joint laboratories. To capitalise on their investment, companies should appoint some of its R&D engineers to work closely with researchers, professors and students. This creates cross-fertilisation between the 2 cultures (academia and enterprise), generates innovation and helps anticipate new topics and technologies.

In mid cycle (the proof-of-concept/prototype stage), these early stage measures will be complemented by partnerships with start-ups or innovative SMEs for breakthrough technologies. This can involve collaborative projects taking advantage of significant public funding and incubators.

The incubator model is very attractive.

- It can nurture a local innovation ecosystem (important in countries where a company wants to develop).
- It is an efficient means of technology watch for R&D engineers.
- If a technology is very promising, its acquisition is cost-effective.

Lastly, an OI strategy can mean faster time to market through:

- Strategic alliances
- Joint ventures
- Corporate funds (e.g. ASTER) to accelerate the growth of start-ups.



« Open collaboration also helps to shape the regulatory framework that is critical to unlock many of the storage services today. »

Can you explain how Alstom is taking advantage of open innovation in energy storage?

Said Kayal, Smartgrid Innovation Director: Alstom Grid is storage technology-agnostic, believing that, ultimately, energy storage solutions should provide multiple services. So different storage technologies need to be combined and integrated.

Open innovation fleshes out our storage management solutions to cover a wide spectrum of potential storage services such as grid ancillary services, renewable energy levelling and grid congestion management. We are experimenting with those services together with strategic partners using various technologies. These can range from large-scale storage (hundreds of MW scale) such as hydro variable-speed PSP, to MW- scale grid connected batteries, down to smaller distributed second-life batteries in smart campuses.

Open collaboration among energy storage stakeholders facilitates this work. It also helps to shape the regulatory framework that is critical to unlocking many of the storage services today.

Could you give some details about the Big Data project Alstom is developing with the SystemX technology research institute?

SK: The Internet of Energy is in our industry spotlight with the increasing number of intelligent connected sensors on the grid. These provide valuable information and decision support for many stakeholders in the energy value chain, including energy utilities, smart cities and end consumers.

In this context, Alstom has initiated a partnership with the SystemX technology research institute in Saclay, France – the SCE (Smart City Energy Analytics) project. SCE, with other partners active in the smart city domain, is focusing on development and experiments on use cases related to smart city energy data management, data security, privacy and analytics. Within SCE, Alstom will further expand its **eterra ODM** solution: a cloud-based big-data platform dedicated to real-time energy data acquisition, synchronisation and correlation.



« Our collaboration with Nottingham University is accelerating our development of HVDC projects. »

Could you explain how joint development with various UK universities is accelerating our development of HVDC solutions?

Dr Kevin J. Dyke, Department Manager, Research and Technology:

Alstom Grid in the UK has close ties with several universities (including Aston, Imperial, Manchester, Newcastle and Nottingham). We enhance developments of new ideas through these collaborations and accelerate our research by accessing academic technical expertise and facilities. For example, our collaboration with Nottingham University is accelerating our development of HVDC projects by providing close technical contact between the research teams of Alstom Grid and the university. This is enabling us to generate intellectual property and validate new concepts,

for example, our next-generation VSC solutions such as the Alternate Arm Converter (AAC). The close interaction helps to focus innovation so that new research programmes are strengthened with greater industrial application.

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