Why Smart Grids take so long to emerge?

Eric Morel - September 2011

Mach&Team provides strategic and operational advice on the energy transition and on the convergence of the energy and the digital technologies based on 6 domains of expertise : Smart Cities, Smart Buildings, Smart Homes, Energy efficiency, Smart Grids and Smart Metering. Founded by Eric Morel, a Smart Grid Veteran, it delivers to its customers strategic and operational consultancy services based on expertise and experience, remaining focused on creating value. Customers range from cities, utilities, vendors to public authorities and financial companies.

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He has been involved in Smart Grids development since 2000. He created the first Energy Efficiency and Smart Grids BU at Schneider Electric, is a co-founder and has served as a Board member at the Gridwise Alliance. He has developped for 10+ years, activities and companies delivering Smart Grid solutions; he has led several projects and initiatives and is today an expert recognized by the main public bodies.

Most of the articles and posts about Smart Grids are tackling consumers behaviors, consumers involvement as if electricity consumers were the missing key for a wider Smart Grids adoption.

By the same time, thanks to various studies, we can see that Smart Grids miss awareness and that often, consumers don't understand the value brought by Smart Grids.

I wonder if the real key is not also on the utilities' side. But what is it?

Smart Grids are firstly an evolution of existing grids, the next coming one; but this evolution appears as different from previous ones as it includes many hidden consequent ruptures. Among others:

- the grid architecture has to be adapted to the emergence of DER; as a result, the way to control the network has also to evolve
- the relationship between the energy producer, the energy distributor and the energy consumer has to be completely reshaped
- selling electricity is not any more at stake; consumers buy electrical performances (quality, efficiency...)
- ICT technologies bring at least as many benefits as traditional electromechanical technologies

To address these ruptures, utilities and energy companies:

- need to transform their grid. But how to invest with an acceptable impact on their bottom line?
- need to acquire data. But which ones?
- need to transform these data into value to be provided to consumers. But how?
- need to adapt their organization. But when? The later the better

They have to enter, certainly for the first time, the real world of complexity. And so, Smart Grids development has to be managed taking into account the main features of complexity management: they have to think globally and avoid linear thinking.

This means that, at a national level as well as at a community or utility level, the process to develop Smart Grids should follow three main stages:

- increase knowledge, understanding and intimacy with markets and technologies, mainly through pilots and experimentations, to feed a future vision
- define this vision
- deploy their vision through an emergence process, a step by step evolution of all topics by the same time (that means acquire more and more data, deploy more and more DER, adpat their network control systems, adapt their CRM...) They should not address one topic after the other, but all by the same time and progressively.

Moving forward, with no vision as a guiding line, leads to linear sequences of actions that cannot reveal their full interest.
For instance, we have no doubt: smart meters are compulsory to get our grids smarter. But defining Smart Metering as the first step of Smart Grids is a pure product of a linear way of thinking and often leads to non profitable deployments (refer to almost all recent articles about Smart Meters); by considering smart meters as a stand alone application, utilities cannot take into account the value they will create on top of metering data, just because the other applications are not yet defined. I have seen figures and business plans twisted to be

acceptable. And worse! We expect now consumers to change their behavior to assure the profitability of smart meters!
Of course, I don't mean that behaviors have not to change but this should happen progressively, as part of the global emergence of Smart Grids, by the same time as a result of previous evolutions and as the prerequisite triggering other evolutions.

In addition, with no vision, nobody knows if the meters communication features, the data provided will be those needed in a near future. The meters deployed may have a shorter life time than expected; that gives credit to the doubts expressed by some consumers.

Developing a vision with no deep understanding and knowledge is a theoretical and useless exercise.

And finally, pilots carried out with no obligation to feed a vision become pure technical exercises and are managed to be proofs of concept.

Many actions and projects today fall in these traps and delay the real start of Smart Grids. Some utilities are following the 3 stages described above and demonstrate today outstanding results.

This cultural change of our mindsets will be the main key for speeding up the emergence of Smart Grids.