Smart Grid – Beyond the hype

Presenters:
Steve Mullins
Are utilities that implement smart grid…

Acting rationally in response to the challenges they face?
Acting irrationally as the result of hype?
I aim to convince you that…

Adopting Smart Grid can be a rationale response by utilities to the challenges they face.

However, utilities must be on guard against the hype…
<table>
<thead>
<tr>
<th></th>
<th>The case for smart grid hype</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>The case for smart grid as a rational response to the challenges</td>
</tr>
<tr>
<td>3</td>
<td>The judgment</td>
</tr>
</tbody>
</table>
The hype theory…
Who is creating the hype?

- Vendors
- Utility Executives
- Utility Engineers
Role of the vendors...

Utilities are entering the digital age. Smart is the new norm...

Or, I can increase the size of my business if I call it smart grid ...
Role of the utility executives…

We need to respond to large challenges facing the industry…

Or, I want a smart grid pilot zone because everyone else has one…
Role of the utility engineers…

Smart Grid allows me to solve tomorrow’s problems…

Or, finally, I get to buy some new things…
An “un-virtuous” circle of reinforcement?
Agenda

1. The case for smart grid hype
2. The case for smart grid as a rational response to the challenges
3. The judgment
The case for rational response...
Let’s take a look at what is happening around the globe… North America
Top issues in North America…

- Growing peak demand driving need for additional expensive peaking plant and network reinforcement

- SAIDI/SAIFI excursions caused by aging overhead infrastructure, higher loading and extreme weather events

- Distributed generation targets (renewable and non-renewable)
North American Case Study: ONCOR, Texas

- 120,000 km²
- 43,000 km MV three phase
- 72,000 km MV single phase
- Longest MV-feeder ca. 400km
- 92 counties, 360 towns/cities
- 3,000,000 customers
Reliability and safety improvements through integration of:

- Outage Management
- Energy Management
- GIS
- Mobile Workforce Management
ONCOR:
Rational response or hype driven?

The verdict:

- Integration of outage management systems has delivered improved response times thus improving reliability

Rational Response to second driver
Top issues in South America…

- Theft

- Load growth due to increased electrification and economic growth

- Power quality and reliability for existing consumers and in order to attract investment
Brazilian utilities face challenges with energy theft…
Brazilian utilities are responding with innovative solutions for identifying and managing NTL...

- Automatic reading collection
- Tamper alarm response
- Analysis of customer behavior - over 40 algorithms specialized in NTL detection.
- Burglar-proof meter cabinets for a NTL e2e solution.
Brazil: Rational response or hype driven?

The verdict:

- Smart meters and innovative algorithms for analysing data are helping to reduce NTL and thus saving utilities from penalties

Rational Response to first driver
Top issues in China…

- Requirement to move power efficiently over long distances
- Rising energy demand
- Broader economic development
China reference: Xiangjiaba-Shanghai HVDC link

- Spanning a distance of over 2000 kilometers
- Transmission capacity of 6400 megawatts (MW)
- Operating at 800kV
- Connects the hydro power plants on the Jinsha river on the upper reaches of the Yangtze in central China with Shanghai
China:
Rational response or hype driven?

HVDC, The verdict:

- Need to transmit power economically over long distances. HVDC is a good solution to this challenge

Rational Response, to first driver
Top issues in Europe

- Network congestion and aging infrastructure
- Integration of distributed renewable energy sources
- New uses of electricity (driven by carbon reduction) – e.g. heating, and cars
North Atlantic Green Zone

- The zone is at the forefront in facing the challenges of renewables (RES) integration.
- Existing installed variable wind capacity in the region is already over 180% peak demand.
- The initiative will see a full roll-out of mature and proven smart networks infrastructure aimed at managing the integration of high levels of wind generation.
- It is hoped, as a result of this project, that current requirements to curtail RES can be reduced.
North Atlantic Green Zone: Rational response or hype driven?

The verdict:

- Renewable integration is a key challenge for Ireland and this project seeks to address that challenge by using proven technologies....

Rational Response to second driver
1  The case for smart grid hype
2  The case for smart grid as a rational response to the challenges
3  The judgment
Adopting Smart Grid can be a rationale response by utilities to the challenges they face.

But…

Falling under the spell of the hype is a real risk…
How to avoid being part of the hype...

1. Be clear and focused on the problems that you are trying to solve with smart grid.

2. Only trial solutions that support those objectives.

3. Ensure that there is a compelling business case before implementing solutions.
Position yourself at the rational end of the spectrum.
When you have delivered then hype your project!