

FLEXIBILITY MARKET CHALLENGES: *THE ENEMY WITHIN*

EUROPEAN UTILITY WEEK
HUB SESSION #8

NOVEMBER 7, 2018

Confidential and Proprietary

NAVIGANT

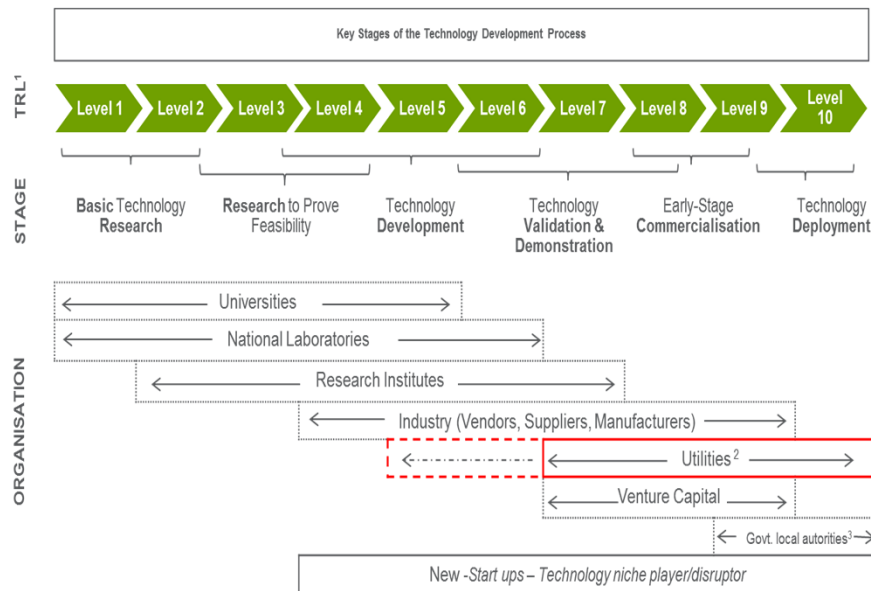
INTRODUCTION

The biggest challenge to flexibility markets is energy companies' relative inability to innovate rapidly (“The Enemy Within”) to keep ahead of market, regulatory and policy developments

- Realising maximum benefit from flexibility markets will require
 - careful market design (ongoing)
 - innovation from service providers
 - innovation from energy companies
- There has been a lot of focus on market design, with much more discussion and debate to come
- There are many service providers and innovative business models
- The key challenge will be how rapidly energy companies can activate and facilitate flexibility markets

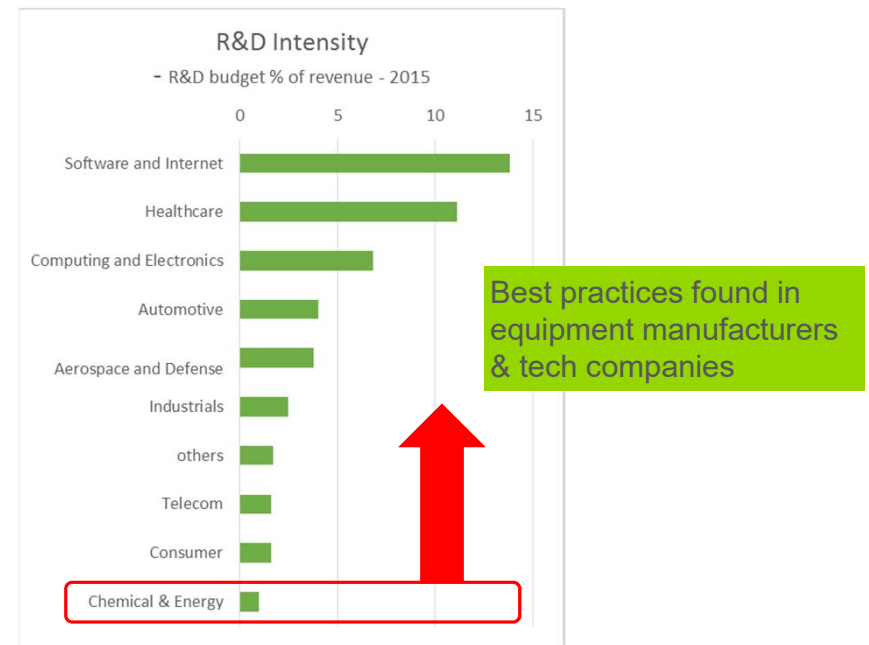
INNOVATION WITHIN ENERGY COMPANIES

Energy companies generally focus on downstream stages of the Technology & Innovation process.



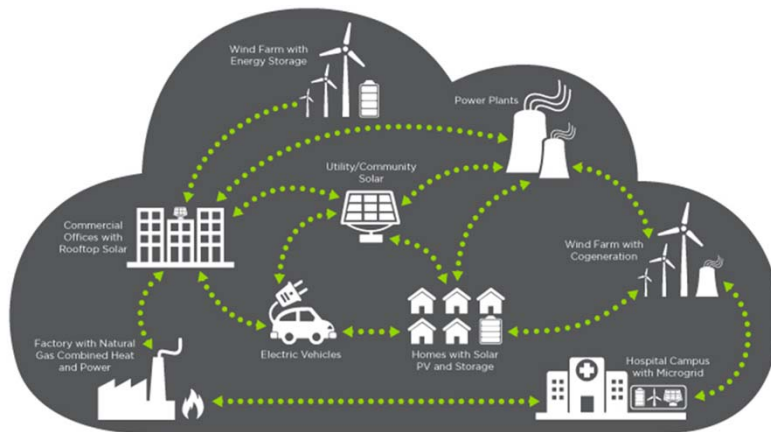
Source: Navigant adapted from NASA's Technology Readiness Level Scale. The official TRL scale is from 1-9; level 10 was added to capture additional market-facing activities.
 1 TRL: Technology Readiness Level
 2 The majority of utilities pursue TRL levels 7-10, with a few large utilities looking at TRL 5 & 6
 3 Federal, municipal and local government planning agencies focused on energy
 4 Bloomberg data, Navigant Analysis

Their R&D intensity was very low compared to other industries⁴: 1%



IN THE ENERGY CLOUD (& FLEXIBILITY MARKETS), INNOVATION IS CRITICAL

The Energy Cloud Decarbonized, Distributed, Intelligent, Mobile



(Source: Navigant)

- 2 ways power flows
- Integration of Technologies and Business models
- Aggressive new entrants (equipment manufacturer, digital player, automobile OEM) and disruptor (peer to peer, market place)
- Convergence of mature technology / data / energy
- Shorten lifecycle and timeline of investment

Will require innovation and more product / market orientation

Digital and platform products
IT / OT Technology convergence







New development practices,
(industrialized development)

Open organization

Cultural shift toward customers and markets

We see efforts towards acceleration of global **innovation programs** within energy companies, trying to catch up with other industries

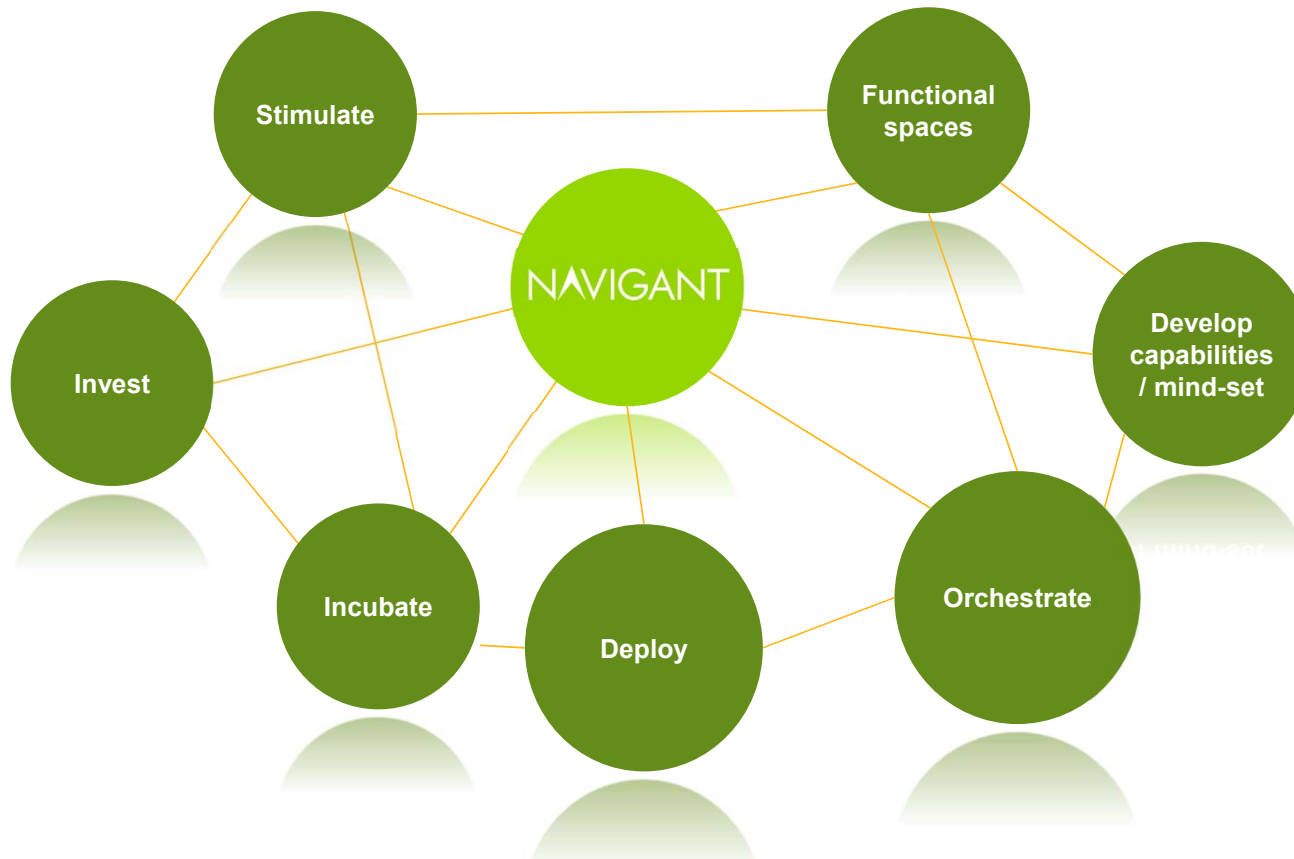
INNOVATION HIGHLIGHTS FROM SOME ENERGY COMPANIES

						
Size [# of employees in innovation*]	<ul style="list-style-type: none"> 260 : Innovability department (R&D) 600 : Enel X 	<ul style="list-style-type: none"> R&D: Not shared Innovation : 60 	<ul style="list-style-type: none"> R&D: - Innovation : 40 (was 100 in 2013) 	<ul style="list-style-type: none"> R&D: 40 Innovation : 50 	<ul style="list-style-type: none"> R&D: - Innovation : 15 +20 in 4 geographies 	<ul style="list-style-type: none"> R&D: 600 320 in Industry Business, 1200 in total
Budget per year	<ul style="list-style-type: none"> 70-80 M€/yr. 	<ul style="list-style-type: none"> Not shared 	<ul style="list-style-type: none"> ~18 M€/yr. 	<ul style="list-style-type: none"> 5-10 M€/yr. 	<ul style="list-style-type: none"> 1.7 M€/yr. 	<ul style="list-style-type: none"> 25 M€/yr. for Industry Business
Venture capital budget	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> 2.5 -5 M€ per investment 	<ul style="list-style-type: none"> ~ 100M€ 	<ul style="list-style-type: none"> Ongoing creation in Silicon Valley (~20 M€) 	<ul style="list-style-type: none"> 10 M€ 	<ul style="list-style-type: none"> Not shared
Key innovation area space	<ul style="list-style-type: none"> E.home, e.industry E.city. E-mobility 	<ul style="list-style-type: none"> Residential and C&I solutions Renewables tech. Smart grid Distributed energy Advanced tech: blockchain 	<ul style="list-style-type: none"> Machine Economy Smart & Connected Disruptive Digital Cyber Ventures 	<ul style="list-style-type: none"> Energy & water efficiency Solar Smart grid Capability building Advanced tech: Blockchain; Machine learning, Drones 	<p>Overarching topic : Smart Energy:</p> <ul style="list-style-type: none"> Data analytics EVs DER orchestration 	<ul style="list-style-type: none"> Convergence of OT & IT: Platform (EcoStruxure); Software & analytics (StruxureOn), Connected products (Masterpact)
Key message	<ul style="list-style-type: none"> One global and dedicated organization Double P&L global /local geographies Strong communication with specific branding 	<ul style="list-style-type: none"> Focus on both in-house idea generation and investments in start-ups Global partnerships with global players (Google, Samsung) 	<ul style="list-style-type: none"> Internal stimulation was a failure Successful transformation to investment strategy Outposts in 4 countries 	<ul style="list-style-type: none"> Strong leadership in innovation department Merger of IT/digital and innovation department Iconic R&D and Innovation Center 	<ul style="list-style-type: none"> Strong leadership in innovation department Partnerships with global players (Siemens, autogrid) Global focus (Asia, US, Israel) 	<ul style="list-style-type: none"> Central innovation structure with department by global business line, governance Global product (platform) : Standardization of products and services Thought leadership

Source: Navigant

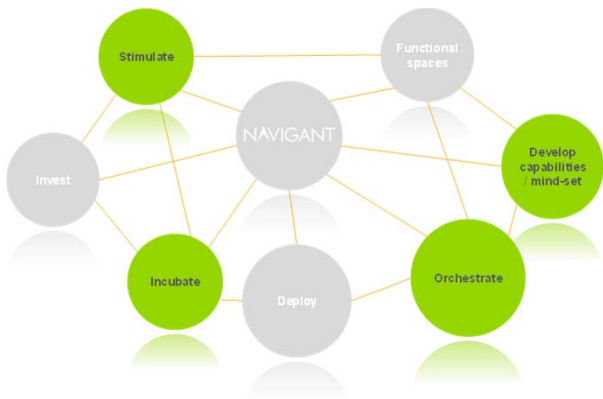
* Innovation meaning new business, not necessarily R&D

...FROM WHICH WE CAN DRAW 7 LEADING PRACTICES TO SUCCESSFUL INNOVATION



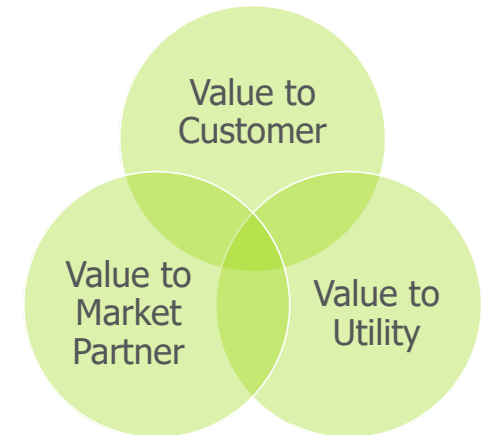
REV CONNECT IS ONE EXAMPLE OF A SUCCESSFUL INNOVATION PLATFORM

REV Connect links energy companies and service providers to address multiple innovation challenges



REV CONNECT

- Brings companies and New York's electric utilities together to **accelerate innovation, adopt new business models and technologies**
- **Advances New York State's Reforming the Energy Vision (REV) goals.**
- Helps companies with flexibility solutions connect with utilities to develop high quality REV demonstrations and other innovative projects.
- Shares good practices and enhances the **culture of innovation and collaboration in the energy sector.**



REV CONNECT INNOVATION SPRINT PROCESS

REV Connect enables market participants to engage utilities in time-bound “innovation sprints”, which accelerate the establishment of innovative partnerships.



KICKOFF

Webinar
with key info for
submitters



SUBMIT

Submitters develop
and submit ideas
**responsive to the
Innovation Sprint
theme**



FACILITATE

Discussions
with REV Connect
team to refine ideas
and **better articulate
value and the
business model**



CONNECT

Invitation-only
workshop
providing qualified
submitters with **one-
on-one time with
utilities** to hear direct
feedback and co-
develop ideas



ADVANCE

Progress ideas
through the
development of
**business cases,
demo projects, or
other partnerships.**
Submit refined ideas to
RFIs/RFPs.

REV CONNECT INNOVATIVE SPRINT EXAMPLE

REV Connect launched a sprint focusing on “*Innovative Energy Efficiency*” over the summer and more than 60 ideas were submitted.

Examples of market-based business model and partnership approaches



Shared Savings Models that Leverage Third-Party Capital

A contract structure in which savings achieved by energy efficiency projects both on the customer-side (bill savings) and the utility-side (non-wires or similar solutions) can be shared on the basis of the initial investment outlay.



Pay-for-Performance

A contract structure between a utility and a service provider in which the timing and level of payments are determined by the actual delivery of energy savings – and which is coupled with a compelling value proposition to the customer.



Leveraging Utility Data for System Value and Customer Acquisition

A mechanism that enables service providers access to data to target customers and model project financials (with consumer protections), thus reducing the cost of customer acquisition and total project cost. Data also enables projects that are responsive to system needs.

SUMMARY

1. Significant, and appropriate, focus on flexibility market design
2. Many service / solution providers with innovative business models ready, willing and able to provide flexibility
3. Key challenge will be how rapidly energy companies can activate flexibility markets
4. Innovation does not always come naturally to energy companies, but there are leading practices for successful innovation they can follow
5. Platforms like REV Connect, that connect energy companies with service / solution providers, can help spawn innovation in flexibility and other areas

Thank you



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