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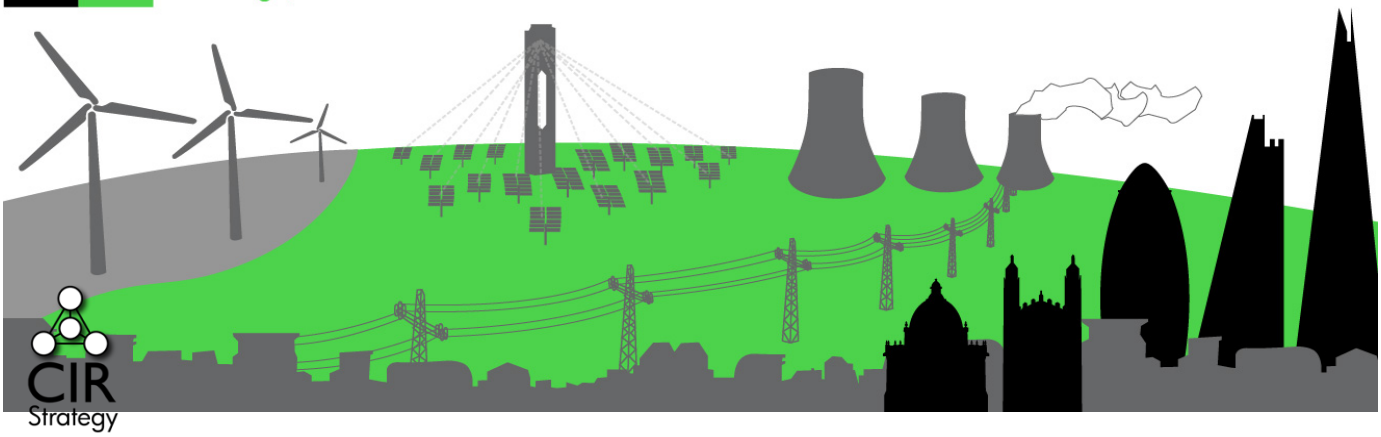
SMART GRIDS & CLEANPOWER



SMART GRIDS & CLEANPOWER 2014 BRIEFING DAY JUNE 3

10:15 - 11:00 Session 1: Introduction Smart Grids & Energy - led by Gavin Jones, Business Development Director, ElectraLink
10:15 Introduction to Day 1
10:20 Definitions
10:30 Basics
10:40 Trends and Drivers
10:50 Review & discussion

Coffee break

11:15 - 13:00 Session 2: Technology led by Dr Andy Stanford Clark, CTO Smart Energy, IBM
11:15 Demand Side Management (DSM) - the key to the smart grid
11:30 Case studies
11:40 Smart Meters & AMI | Interoperability
12:00 Distributed generation - Alan South, Commercial Director, Solar Century
12:30 Renewables and storage, intermittency & flow battery solutions - Graham Ford, Mansion Partners

13:00 - 14:00 Lunch networking & meetings

14:00 - 16:00 Session 3: Markets led by Mike Wilks, Director Smart Energy, Poyry
14:00 Social & Innovation Cartography in grids and energy
14:15 Key players - visions, strategies and what they are doing
14:30 Porter's Market Characteristics & Forecasts
14:45 Demand Response Economics - Asheya Patten, Poyry
15:00 Big Data, Data sharing & privacy - Gavin Jones, Business Development Director ElectraLink
15:20 Monetisation of energy management systems - Pilgrim Beart, Founder AlertMe & 1248.io
15:40 The Industrial Internet - Dr Amyas Phillips

16:05 Tea break

16:30 - 17:30 Session 4: Innovation Challenges - led by David Pitcher, Member, Smart Grids GB
16:30 Energy & grids challenges - David Pitcher
16:45 Case study: LCNF funding and innovation in energy storage - Panagiotis Papadopoulos UK Power Networks
17:00 The value & funding of innovation - Steve Dawson, VP Consulting, Sentec
17:15 Discussion
17:30 Summary of Day

18:45 - 20:45 Roundtable Dinner at King's College, Cambridge (Discussion private)

This 6th Smart Grids & Cleanpower Conference at Murray Edwards College is organised by CIR Strategy in association with AlertMe. It is part of the CIR Conferences Series, which has run since 2007. The next Smart Systems Summit 2014 takes place on 1-2 October 2014 London at the Institute of Directors: www.cir-strategy.com/events/register or 01223 303500

Smart Grids & Cleanpower 2014 Briefing Day - June 3 – Notes by Kyae Kwon, edited by CIR Strategy

Introduction by Justin Hayward

CIR strategy

- track record of working for high tech companies: e.g. ARM, Domino, Xaar; Plastic Logic; Galu; Blue Gnome (health care); Orange; FINPRO; RoyalMail
- highly hands on work : bundle resources for client (IP management; marketing & Sales; funding health; conferences)

- there is a method for optimising "how well we engineer our routes to market will determine the values of our business"
  - value network analysis and stakeholders: based on tests & evidence to work out the lowest time to value
  - based on confidence levels; turns out that best way to predict outcomes to look at confidence levels, which changes over time, can improve percentages in various diagrams by doing, lean start ups
  - benefits: reducing risk & time to value; for execs, decision quality; fast and easy to set up and use

- applications of RtV: value based contracting; governance of application of public funds; KPI and balanced scorecard inputs; SME strategy development and tracking (an operating system for the org.); also does opportunity prioritisation or impact assessment to current strategy; and does Lead Generation & Sales, which can be connected to social media

Session 1: Introduction Smart Grids & Energy - led by Gavin Jones, Business Development Director Electra Link

The questions re: smart grids:
- why
- what
- when
- where
- how

1) why?
- the energy trilemma (energy security; cost; climate)
- occupying the minds of government and regulators ;
- Jones argues that energy is the most imps. infrastructure; more important than transport, more important than water
- impact of lack of energy in terms of health & education, employment; huge
- impact of lack of access to energy -- the third world
- we take energy for granted; actually isn't the reality around much of the world; becoming more doubtful whether that will be the reality (not having the security of energy, potentially huge impact on economy and lifestyle)

- climate.
  - the need to move to a low-carbon technology, protect the climate & all the impacts

- cost.
  - no use of having energy only the rich can use
  - some politicians have talked about smart meters, resulting in the rich having dinner at dinner time

- comments re: energy security
  - in the past, we used to be the producers of our own energy
  - oil form the north sea more recently
  - last year UK energy production was dropping; what's happening, dropping it's not there because the facility is not there
  - last coal mine closing & more reliant on energy coming elsewhere
  - 2 years ago, had a buffer between energy supply and demand of 16%, but this winter that will fall to 5% and it could 2% by 2015, according to the National Grid (BBC)
  - (frankly, national grid putting a more positive spin than the reality)
  - Mr Buchanan feared we will be dangerously close to not having enough power in the grid to keep Britain's lights on (Telegraph)
  - also has to do with the issue of energy security;
  - e.g. Ukraine - how many pipelines go
  - last year the UK relied on Qatar, this year Qatar is selling elsewhere

- electricity is only part of the energy system
  - DEC website
  - where different sources of energy come from: where it's ending up
  - electricity only 18% of final consumption (most - heat and transport)

- cost
  - a major issue already
  - domestic electricity price pretty reasonable across Europe
  - a major competitive issue
  - raw wholesale cost, hardly anybody who has more expensive
  - don't see wholesale energy prices going down
  - will impact the competitiveness of the economy; people will move their businesses elsewhere (the world is flat); somewhere cheaper...
  - shale gas that won Obama the last election ; the real. cheap gas prices (Gas cheaper than Coal), has enabled industry to open plants

- Roles
  - unique about Britain
  - number of players
  - unbundling groups according to their role
  - makes things like smart grid very hard (division between cost and benefits ; dispersed across different players)
  - e.g.
  - Suppliers: British Gas; EDF; Eccotricity; FoFirst Uitlity; SP]
  - Tranmission system operator: national grid
  - balancing and settlement company: elexon
  - generators: British Gas; Edf Energy; Ecotricity; SSE; SP
  - distribution network operators
  - transmission system of national operators: National grid; SSE; SP
  - meter asset providers: macquarie; calvin; NPG; LowriBeck
  - Aggregators: Kiwi Power; Flexitricity (energy services companies)

- Meter operators: British Gas; SSE; G4S; Calvin; Siemens; LownBeck
- different actors get benefits/ threats with implementing smart grids
- policy : DECC (a record number of energy ministers; a challenge0
- regulation: Ofgem

(1) Definitions

Smart Grid - an intelligent electricity network that matches supply and demand
ESCO- energy services company
DSR- demand side response
DSM- demand side management
Smart meter- meter that has 2-way communications
CHP- combined heat and power

(2) Basics

What does the smart grid need to enable us to manage? overall demand; peak demand ;frequency; voltage; active power; reactive power; temperature (of the equipment); asset life; reliability; cost

- Smart Grid Forums
  - a recent paper called “Smart Grid Vision and Roadmap”
  - avail. on DECC website
  - challenges & what we can do about them
- UK leading europe in smart grid investment (Research); according to Joing Research Centre European Commission
- smart meters in britain:
  - a smart meters in the home, connected by communications hub;
  - also going to be consumer access device
  - communication service providers
  - data services provider sits in the middle
  - then connecting back out to energy suppliers
  - a unique structure that is being done in the UK

WHEN?
- do we need it now?
- a couple different DECC scenarios (re: heat pumps; photovoltaic; electric vehicles)
- which of these you pick, impacts what you need to have out on the grid
- mathematical modelling - looking at the impact of diff. scenarios and technoliogy (RIO -ED1 & RIO ED2)
  - only in the second one; smart grid tech. the trial hase matters. making the call about which tech. to implement

WHAT?
- does it consist of?
- different sorts of generation activities

- intelligence sub
- - generation; transmission and distribution; retail
- a complex arena to manage values and benefits
- a challenging questions
- the role of the distribution network operator is changing (UK Power Networks)
- future role quite different

WHERE?
- UK not uniform
- demand profiles different for types of homes
- EHV- HV- LV
- different networks with diff. characteristics

HOW?

- a chart of Ofgem working for
- how we handle when we have all these different players
- supplier leads engagement (or pay 3rd party) with customer and holds responsibility for signing customer up and providing support
- plenty of changes
  - .e.g. DNO not allowed to regulate remotely

SUMMARY
- it's complicated
- a lot is happening
- more is needed

Questions

1) scientific life- final solutions tend to be elegantly simple; whole mechanism very original approach; innovation going to move so fast ...

DECC & Ofgem trying to put in a market structure in to allow innovation; challenge, if you leave it too open, not the right decisions

2) how to get politicians to understand the need; that far too much short-terminism ?
- smart grid forum, a DECC & Ofgem group - getting the input from the industry
- whether the group's great or not; much better than before
- dialogue happening
- reg. scheme re: price review not just about making it cheaper ; ->
- politicians a challenge - keeps changing

3) do you think that energy trilemma is fundamental? can it be resolved?
- energy security & cost - the most important things that governments have to ensure

Session 2 - Technology

SMART GRIDS & CLEANPOWER

Dr. Andy Stanford-Clack
Chief Technologist, Smsarter Energy
IBM UK
andysc@uk.ibm.com

(1) Demand side management -- the key to the smart grid

a. what is it?

- 3 components: supply; transmission; demand
- the job of National Grid: demand equalling supply
- turning 'stuff' down can be problematic.
  - problem in the UK, can't turn off electric loads
  - what can be turned off:
    - domestic: fridges; air conditioning; air-source heat pump (available source in the future; ~1KW); electric vehicles (about 4Kw when charging)
    - industrial: chillers; air conditioning; combined heat and power; big machinery (National Grid already has agreement)

b. why do it?

- 1) demand reduction (to stop the lights going out in 2016)
- 2) peak shifting
- 3) peak lopping
- 4) trough filling (with access generation, to turn things on; EV charging flexibility would be useful)
- 5) short-term operating reserve
- 6) trading (can bid your generation to somebody who would buy it)

c. how to do it

- 3 'easy' ways
- 1) frequency control - where fridges play a role. When grid is exaclty balanced, it's allowed to go either way; if the frequency is less than 50Hz,
- 2) remote control - how demand aggregators work ; sending signal to electronics
- 3) virtual power plant - taking positive and negative energy sources, and bidding the output of the power station to the market

d. the future

- 1) micro-generation integration
- 2) storage- domestic, community, grid (can do at different levels -- housing, regional and national); rather than absorbing, storing it
- 3) smart appliances - appliances negotiating, bidding on electricity price
- 4) dynamic markets and settlement

(2) Case studies

- examples of DM in action
- a. Pacific Northwest NAtional LAboratory
  - had constraints on the power lines; put smart controllers in the home

- what happened at the end of the year, electricity bills reduced by 10% and peak load reduced by 50%; and savings to energy companies = 70 billion USD

- b. Bornholm Island: balancing wind energy with demand
  - a small island with 40 households
  - EDISON project: 50 EVs on the island used as storage batteries for excess wind energy
  - EcoGrid EU - new project to balance load using dishwashers, heat pumps and electric water heaters

- c. Nevada energy cool share program
  - similar to the Olympic peninsular one
  - a digital control at homes; if opting in, they can turn off the energy control
  - energy rebate calculation = energy saved (kWh) x real time energy rate ($/kWh) = energy rebate

- localised demand management

- remote demand management
  - an experiment : sent a control signal to the home

Q: on green data center?

(2) Smart meters & AMI

a. Smart MEtering v. AMI/ AMR

- smart metering; connected to the outside world
- AMI/ AMR: gather the data and transmit locally;

b. UK Smart Metering Infrastructure Programme

- DCC, DSP ,CSP, DSU, ATP

- the UK Government has mandated deployment of 53 million electricity and gas smrat meters

c. DECC DCC Procurement model

- the basic model :
  - IT & Data Services- CGI: single IT and Data services connect providing 2-way communication

(4) Distributed generation
- by Alan South - Solar Century, Chief Innovation Officer

- solar in 2006 : a 'maybe' technology
- the idea of distributed generation has been there for a long time
- micro-power proponents; generating power close to the use
- what's interesting: the norm until surprisingly recently (the UK National Grid was set up and running in 1935)

- Shell New Lens scenario put forward last year (what energy scenario would look like in 2100); particular view -- solar will become the dominant renewable power)
- also about massive electrification of energy (I'm quite an electrification fan)
- what blows my mind: the work on electric aircraft
- the flip side: a huge strain on the grid
- renewables, in terms of criticism, deserve a fair share
  - most renewables essentially use the grid as battery without paying for it
  - e.g. electricity in Germany : a negative price on the spot market; causing considerable disruption
  - bias of renewable energy: paying little attention to consumption pattern

- one view of the future
  - centralisation that happened fom 1930s, a one way ticket
  - 3 concerns of
  - 1) tend to be centrally driven
  - 2) tech. led utopia
  - 3) in terms of time scale, prudent to be cautious

-the disruption
  - whether the disruption was the report from Morgan Stanley, on Clean Tech, Utilities & Auth.
  - rhetoric: improvements in batteries and distributed generation could partly or completely eliminate some customers' usage of the power grid

- distributive generation : low cost renewable and accessible storage and controls + grid charges and /or poor grid

- 3 case studies

  - the growth of solar business coming not fromthe West
  - a. East Africa's largest solar installation; was just fed up with the PV because of low reliability; also medium to small storage has a room to play
  - b. SolarCity; 200 million dollar company; most people in the investment community say that they are unstoppable
  - they managed to get their projects classified as asset backed security
  - c. ProxEnergy. a Dutch start up doing a personal smart grid; apart from a bit of European funding, self-sufficient company

- to conclude. focus has been on solar. no reason this couldn't been wind, wave, or geothermal etc. foresees that renewable market will be bigger than we think

"...think investors generally do not appreciate the potential size of the market (Morgan Stnaley)

(5) Renewables and storage, markets and intermittency
- Graham Ford- Mansion Ecopartners
- www.hvm.uk.com

Four questions?

Introduction

- Pathways to decargonising the generation mix; it's all about carbon, not about resource. Somewhere between 3~20 trillion tons in the North Sea. no shortage of resource; but shortage of where to put the CO2: renewables; efficiency; nuclear ;CCS. Answer = a mix of all of them.

- Generation issues:
Renewables: intermittency; cost
efficiency: penetration ;cost
Nuclear: safety; capacity; cost
CCS: capacity; workable; cost

- Sources of value in the UK: (occurring from 3 sources)
  - 1) absorbing the peak output: less curtailment of renewables
  - 2) meeting the peak demand: savings in high cost CCS CAPEX; savings in distribution
  - 3) greatest value - distributed storage

1. what contribution can renewable and storage make to powering the UK electricity grid?

- by 2030, assuming the 4 ways of economising moves towards renewables, 3.5 GW of storage capacity would deliver 2billion/ year; in 2050 - 11GW of storage capacity would become 11 billion pounds / year

2. What storage technologies make sense /

  - options: lead-acid; lithium; fuel cells
  - if we want world scale storage - lithium resource is problematic
  - the VR (Vanadium Redox) Flow Battery can be a solution

  - ranking the storage technologies (problems):
electrochemical batteries: resources; cost
thermal: efficiency; cost
compressed air storage: efficiency; cost
pumped hydro: planning; cost

  - VR battery's key features for reliability :
  1) power and energy independent
  2) very low maintenance
  3) safe operation
  4) very long life

  - can VR flow batteries provide grid-scale storage for distributed power storage? 200 pound/ kW- year will be achieved before 2030

3. what market conditions

  - ver hard to judge
  - what is needed:
  - 1) commitment to carbon reductions

- 2) high cost of CCS
- 3) low cost of wind and solar
- 4) low cost of storage
- 5) rapid supply of storage (potential benefits)
- 6) market mechanisms reflect full value of storage

- where might we begin: where the grid is weak (around the islands in the UK)

- balancing generation. compatible with other activities?

- scenario for 2050
  - addition of storage will tend to crowd out gas-fired CCS, due to lower cost of storage
  - more than half of the UK generation capacity could be renewables by 2050
  - storage capacity > (wind dying out can be spread)

- advantages of renewable + storage pathway: rapid implementation; competitive; home grown; compatible with alternatives

Session 3: Markets (led by Mike Wilks, Poyry Management in consulting)

(1) Social & Innovation Cartography in grids and energy

- where you look to from e sector : renewable sector (solar and wind); this is transforming the electricity markets across Europe
- the pathway towards dealing with climate change changing the sector
- 'disrputive' a very accurate description of what is happening to the industry
- tried to quantify wholesale prices and generation in 2030 in 2009
- the three charts show: intermittent generation; prices becoming more volatile and becoming negative); and incumbent infrastructure which shows the requirement for regeneration

- under a BAU scenario, meeting 2050 targets could lead to a five fold increase in costs to electricity consumers
  - why? BAU, model existing since 1960s not viable from security and environmental perspective

- two fundamental ways to decarbonize : 1) reducing the peak demands; 2) steer the price effects (reducing overall cost)

- a big challenge; 4 ways to deliver flexibility to the system
  - 1) flexible generation (typically carbon intensive)
  - 2) increased inter-connection (a popular option until decision makers became concerned about security of supply; also a question about how far a country goes to inter-connect)
  - 3) demand side response: can deployed in a number of different ways; needs a willing customer (difficulties concerning public education)
  - 4) electricity storage (storage key part of the mix; the beauty of storage is in its diversity; if we're committed to decarbonization, then the scale of flexibility requires ALL of the solutions)
  - the question: right balance and right timing of introduction of these solutions

- the way the market operates in the future will fundamentally change

- in the future, there will be a fully multi-directional and interactive market at national & local levels where dynamic & flexible demand co-optimises with diverse and more unpredictable sources of generation
- the real focal point for change : local and regional network and deployment of low carbon technologies (electric vehicles; heat pumps etc. that have to be managed locally)
- the CAC centralised solution just not going to work

- future smart grids will interact in many different ways with a range of loads & distributed generation
  - monitor, take and manage action in real time;
  - demand behaviour at both a consumer and supplier level will become more dynamic and less predictable
  - and automation will be a key enabler of smart grids

- future domestic consumers will be different & integral to the energy system
  - consumers will change at different paces for different reasons
  - emergence of local system operations via smart grids will be a key local feature
  - communication and control technologies will be key to effective implementation of "soft demand side management" -- complex operations with customer friendly interfaces

- value propositions
  - decarbonisation driving the change towards 'smart' energy
  - which will require a change in the way we do things: not just for the new entrants but the existing players as well

- policy and regulation struggling to keep up with innovation
  - it's multi-faceted and difficult,
  - let's try to create an environment -- market can help transform the industry; rather than try, control and channel
  - creative ideas generated that have the potential to benefit other economies

- how the demand side responds: DSR facilitated by smart grids will not just ensure security of supply; but also create new commercial opportunities

(2) How Porter's 5 Forces (as a framework for looking at this)

- dates back to mid 80s
- everybody's application unique to situation
- the main structure: the basic competitive position; 2 different threats (threat of new entry; threat of substitution); and generator and end use power

- 3 generic strategies based on the 5 forces model
  - 1) differentiation
  - 2) cost effectiveness
  - 3) focus strategy

- Rio = revenue = incentive + outputs
  - network companies judged on what they deliver, not what they spend

(4) summary and conclusions

1. the energy sector is trasforming
2. the smart energy paradigm is no longer a concept
3. the future landscape is ripe with uncertainty
4. it is clear that existing market players' business strategies need to change -- equally new market players need to set theirs carefully as risks can be high
5. the key to success will be to have a clear strategy

(2) The economics of demand response

- by Asheya Patten

-assumption : a range of anticipated changes affect the need for and supply of flexibility
- a number of factors under drivers for future flexibility need & drivers for future supply of flexibility
- demand response one of the pillars of flexibility

- the demand response required by the market
  - at the moment used by a part of STOR
  - also various technologies exist
  - as need for flexibility and reserve increase due to variability and unpredictability of renewable generation

- suppliers can also use their demand responses as well
  - when demand response used, ends with lower wholesale prices; shaves off the peak and parts of wholesale costs

- demand response a source of flexibility and competitively; at the same time, it can also destroy value

- capacity payment only comes in 2019,
  - a number of policy decisions will alter the landscape for DSR
  - overview of policy changes: capacity payment; DSBR/ SBR; Cash out reform; smart metering roll out; RIIO
  - whether it will carry on after 2019 is debatable

- why is coordination needed?
  - there are many actors that would use demand management
  - to optimise the use of demand response
  - financial aspect -- who's paying the customer (is the value chain going to be paying for duplicatory factors)

- 'Trust' - a component lacking in the current GB market
  - trust in government
  - trust between the value chains
  - consumer rust in both energy companies and in governmental policies important to deploy DSR

- summary
  - DSR could provide flexibility to the system; implementation needs careful thought

(3) Big Data, Data Sharing & privacy

-re: smart meters
- advantages: improve industry processes; reduce cost to consumer; identify and remove bottlenecks
- constraints: data protection (contains commercial information and understanding); privacy; commercial concerns

- balance for the company
  - advantages v. risks
  - advantages: reduce costs, risks and better serve customers
  - risks: competitors might use the information better; somebody might use the information against the company; change is risky

- balance for the consumer
  - advantages: lower costs; and better service
  - risks: using the information; trust issues; not understanding how the information will be used

- electralink examples show that people are moving to small suppliers
  - this has been gathered from process messages
  - looking at another region; how energy consumption has changed between different groups of people in different areas

- also working with Energy Savings Trust - to support the smart meter rollout (make it cheaper and easier to install the meters)

- summary
  - 1) make better use of data
  - 2) share information and learn as an industry
  - 3) protect individual and commercial interests

(4) monetising home energy management

- Pilgrim Beart

- home energy management matters. 30% of UK's energy is used in homes
- we do things bottom-up way, not top-down; meaning that consumers move 'fast, unpredictably and uncontrollably'

- the internet of things
  - connecting home a broader phenomenon
  - three catalysts driving a significant market: connected consumer; sector (that serve the home) transformation; established industries

- the connected home market map
  - no one firm can dominate this market; consumers are too complex
  - e.g. Apple partnering up with nest

- how it works
  - 1) devices speak wirelessly to home hub
  - 2) use home broadband

- 3) in cloud, there are stores and analytics
- 4) smartphone app

- 2 propositions in the market today
  - 1) smart phone allows to control thermostats
  - 2) (not deployed yet) DIY chain (LOWE's noticed that more products that they were selling were more products online; then saw things to unify things, and called it Iris)

- stages for managing
  - plan for scale :
  - 1) make it work; scale; cost
  - 2) provide service that make sense to the consumer
  - 3) create innovative propositions beyond just selling a device or a subscription
  - 4) there are many ways to monetize

Dr Amyas Phillips, Research group of ARM

Embedded chip growth has been driven by connected devices. ARM is in a sweet spot for delivering chips for this sector.
Internet of Things (LoT) relates around chips being connected, but more than just a network of connections. Most successful application is its actual connection to the internet, which through the Internet Protocol developers and software teams can build on top of the underlying architecture without actually knowing all the lower level details. Gateway device converts and allows interconnection without disruptions.
Embedded intelligence in a device can be reduced when connected to the internet. Devices become decoupled and allowed to be controlled by multiple software applications. Software Abstraction (middleware) is the key connection point that enables this feature.

Industrial IoT could be the next major revolution as it connects the industrial revolution with the information revolution. Information is valuable and automation becomes possible. Many examples of these applications already in use. Apps become tools that have valuable use in the real world.
Security is an obvious concern as connected devices are more vulnerable. Industrial processes can be very significant if it includes control functions. However, relatively manageable with existing techniques, including VPNs, firewalls, etc. Also benefit from fact that many devices have extremely limited functionality and scope, which is easier to control.

David Pitcher, Smart Grid GB
Smart Grid GB is a VC backed network with BG and Siemens as investors.
Produced two reports on case for smart grid. Technologies are way ahead of the regulations and regulators.
Panagiotis Papadopoulos, UKPN
UK Power Networks is a DNO, one of the largest in Europe. RIIO-ED1 is the template that will help foster innovation. Currently rolling out several innovative programs to make the grid smarter and to be more efficiently run.
Storage project is underway – the largest battery in Europe – one example of developments.

Steve Dawson, Sentec
Value and funding of Innovation. Pandemic of Innovation where companies are panicking over the need to innovate. Gentle approach can really help your business, whereas blindly cutting-and-pasting the latest framework, like Six Sigma or Lean can destroy a firm.

Big companies may not be the most innovative but they have the resources to deploy solutions to problems when they apply themselves. Examples include P&G, which went outside the firm to seek "open innovation" to bring in new ideas. Or Intuit, who had many ideas, but poor delivery skills - could not split good ideas that will make money from bad ideas that won't make as much or solve a major problem. Both firms took a careful and measured approach and were very successful. Need innovation to solve the right problem, with the right people, with the right tools, and the right partners. Biggest challenge is identifying the right problem.
Innovation is just problem solving. The value of innovation is understanding what it means to your business. Funding your idea is an attitude, not an action.

END OF NOTES

This was a full day conference executive briefing day run by CIR Strategy (Cambridge Investment Research Ltd) on 3 June 2014 at Cambridge University for executives seeking to update and receive knowledge about Smart Grids and Power Generation. The event included 9 in-depth talks throughout the day, a lunch, breaks for private meetings and high level networking with other delegates and the leaders & speakers. The day culminated in a roundtable dinner at King's College Cambridge.

Upcoming Events run by CIR in this and the HVM Series are available for booking via http://www.hvm-uk.com