SMART HOMES CONFERENCE 2013 CAMBRIDGE - SUMMARY

Opening Session – Connected Intelligence

10:00 Justin Hayward, Director, CIR Strategy, **Introduction**
10:05 John Riley, **Head, Digital Policy Alliance UK Gov,** Chairman's Remarks
10:10 Bryan Lawrence, Solutions Marketing Manager, **ARM**, **Lead Sponsor**
Empowering your home: realizing efficiency, comfort and security
10:25 **Robert Brunbäck, CMO**, Telenor Connexion AB
The smart home: from vision to reality
10:40 Ian Ellerington, Head of Innovation, DECC, UK Government
Energy innovation programmes & funding
10:55 Steve Kaye, Head of Innovation, Anglian Water plc, **Gold Sponsor**
Big innovations in water
11:05 Panel with **Chair**, & Marco Pisano, **ESCO**, followed by **coffee break**

Session 2 – iWATER – Water Technologies

11:40 Linda Berkshire/Clair Longman, Water Efficiency Managers, Anglian Water
Water & customer experience & In-house displays & devices
11:50 Laurie Reynolds, Director, Aquamatix Ltd
Connecting the water industry to the Internet of Things
12:00 Chris Phillips, Marketing Director, I2O Water
Under Pressure: advanced management technologies
12:10 Marcus Fowler, Tynemarch - **Hands to the pump: total control software**
12:20 Dave Singerton, Anglian Water
Weather data & automated real-time control of sewerage systems
12:30 Panel with Head of Innovation at Anglian Water
13:00 **Rapid Innovation Pitches** CIR Strategy & Venture Partners
13:10 Lunch and joint networking with HVM Graphene Stream

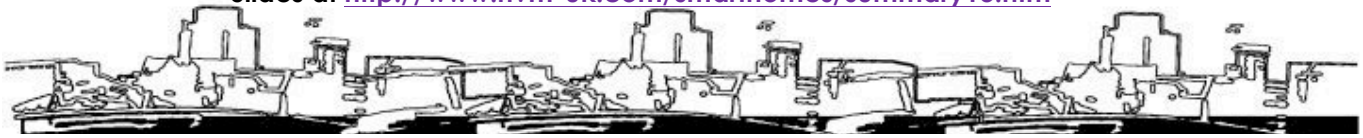
Session 3 – HEAT – Homes Energy & Technology

14:00 Graeme Hodgson, Project Manager, Hitachi Europe, **Gold Sponsor**
Strategy for smart communities
14:15 Andy Nowell, Head of Smart Buildings, Sentec Ltd
Why "appcessories" are hot and energy is not
14:30 Andy Heaton, CEO, EnModus Ltd
Connectivity in the smart home – Winner Takes All or Horses for Courses?
14:40 Russell Haggar, CEO, Xsilon Ltd
One Internet of Everything to find them all and in the Smart Home bind them
14:50 Chris Wright, Founder, Moixa Energy
Distributed Energy systems: time shifting DC & lighting load
15:00 Panel with Graham Ford, Mansion Ecopartners & **Tea break**

Final Session – Smart Homes & IoT Entrepreneurship

15:40 Adam Gould, VP, ARM Sensinode
Introduction to IoT for Smart Homes
16:00 Amir Chaudhry, Co-Founder, Nymote.org
Dumb homes, smart people: generational systems for IoT
16:10 Ben Kott, CEO, EnergyDeck Ltd
A Powerful platform to reduce energy cost
16:20 Usman Haque, Founder & CEO, Umbrellium Ltd - **Empowering smart citizens**
16:40 Pilgrim Beart, Founder Director, AlertMe Ltd**- Smart homes at scale**
17:00 Plenary panel **with John Riley, Head of DPA, UK Gov** then Chair Summary
17:30 **Networking Drinks**

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm



Notes (by William Campbell MBA, edited by Justin Hayward)

Opening remarks:

John Riley's Digital Policy Alliance (UK Gov) Covers both EU and UK.

Next generation of internet is slowly falling to place and continually evolving.

Likely to see exponential growth of devices being enabled due to internet of things and increasing take up of connected products.

Smart metering taking off in a big way.

Dangers of new technological development:

Innovation taking place in silos.

One of key focus' of this conference: connectivity, Water, Homes Energy & Technology and Smart Homes.

Session 1 - 1 - Empowering Your Home realizing efficiency, comfort and security

ARM focused strongly on internet of things

Currently the internet of things is a vision.

Interoperability is key.

Data management. How can this be kept securely?

Demands on hardware: highly Integratable and low cost.

What is a smart meter?

Only truly smart when the chips communicate with the white goods and follow a program implementing efficiency.

Need to move to common standards to allow whole industry to increase in size.

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

i.e. collaboration between competitors to create cooperation.

Internet of things,

Requires management of small packets of data.

10s of bytes need to be managed as opposed to 100s or 1,000s.

Wide range of physical connectivity options (Bluetooth / NFC etc). These need to be compatible / to integrate.

How does one make money from IoT?

Locations of revenue streams need to be understood.

ARM looking to common set of standards to enable innovation driven by diversity.

Session 1 - 2 - The smart home from vision to reality

Telnor group: one of largest mobile operators operating in Nordic region.

Cross region operation. Automotive / security / health / smart phone.

In Sweden, all electricity meters are connected.

Main mission: help companies become connected.

A smart home is a connected home.

Hype has been going for many many years. Momentum over last few years has become more focused.

10 bn devises currently.

In 2020 ~50 bn predicted.

Challenges ahead in delivering this uplift.

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Cost of hardware decreasing rapidly.

Value of connectivity grows with no. of devices connected and with effective use of that data.

Size of devices and components decreasing rapidly.

Is the home the place to be smart?

Or

Is it the people in the home who are looking to be smarter.

'smart' products historically have been smarter than their first generations.

But

They're not connected. They're fragmented. They're technology driven and costly and are complicated to buy / use.

Some companies such as Nike have been excellent at designing the seamless user experience and have collaborated very strongly with others such as Apple / Xbox etc to achieve this.

Typically they (and other leaders) collaborate with the leaders in different fields so they may grow other new markets.

Stickiness and loyalty: the service is heightened and delivers a seamless user experience.

Volvo created app to control your car. Initially didn't sell for first 8 years though now, when developed into app and provided functionality to pre-heat it was successful. This shift in user ability has enabled them to build on more functionality to it.

What is it that the consumers actually need / want?

They are likely to want enhanced functionality from their existing products which could be delivered by improved connectivity through more devices.

Collaboration between other players in different markets is key to achieving improved services.

Like Nike, movement from product centric to service centric offerings Is likely to be key to successful market growth.

Session 1 - 3 - Energy innovation programmes & funding

Certainties: technologies we have currently aren't not sufficient to prevent: 1) shortfall to affordable energy supply; and 2) catastrophic climate change.

How to avoid the valley of death. i.e. how do you get the early stage lending off the ground?

LCICG – low carbon innovation co-ordination group.

Technology innovation needs assessments
Aim: to send message to market of gaps which need to be filled.

Interesting funding for non-domestic buildings

This could encompass insulation, smart energy saving devices.

How can they help get the products to market?

25 feasibility studies delivered to date.

10 of these are being taken forward and are being built.

Advanced Thermal Storage Competition

How better to store heat than in water? Some advanced phase systems which can achieve this.

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Smart heating controls

Does improving heating controls reduce the energy consumed by householders?

Data collected on this is inconclusive. No clear correlation between improved heating controls and reduction in energy usage.

Energy Entrepreneur's Fund

Particularly useful to start-ups. Very useful to help get products to market.

Session 1 - 4 - Big innovations in Water

CR strategy: Love Every Drop - Focused around upcoming shortages in food and water in future.

Water industry – Anglian water's assets: 40,000 km of water networks, 60,000 km of sewerage networks.

Many of these are old and potentially >100 years old.

How to introduce innovation to such a network?

Water industry, operates on 5 year investment cycles.

Aim: to reduce customer bills whilst providing improved services.

Big upcoming challenges:

1. Retail separation

Industrial customer base will be open for competition.

- Becoming increasingly engaged with their customer base to address this.

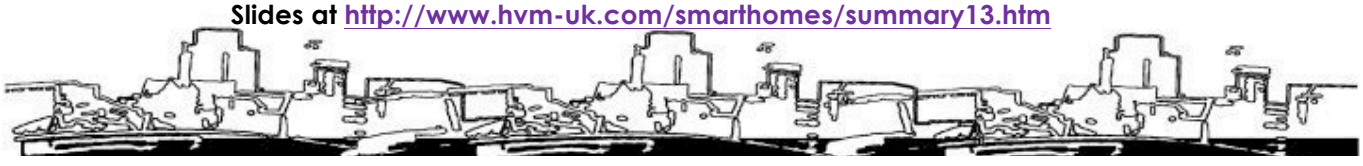
2. Climate Change

Low rainfall.
Increasingly varying rainfall patterns.

3. Water scarcity challenge

Where to source this from in the future?

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm



Annual average for leakage is still 22%.

Whilst Anglican water is ~18% this is still (too) high.

Interesting technologies being utilised to drive this down (sound / radar).

Other interesting work being conducted on pressure management. By reducing pressure in systems, bursts are reduced, leakage levels are reduced and energy too.

Sewers:
The sewer networks are being transformed to real time systems which are integrated with predicted weather patterns.

Key thinking is moving away from end of pipe solutions to solving problems at source.

i.e. prevention is better than cure.

Water recycling (not waste water treatment)

How can energy be generated from sewage works?

Some 90 GW is being generated from the sewage plants now. All from sewage sludge.

Desalination
Hugely energy intensive and expensive.

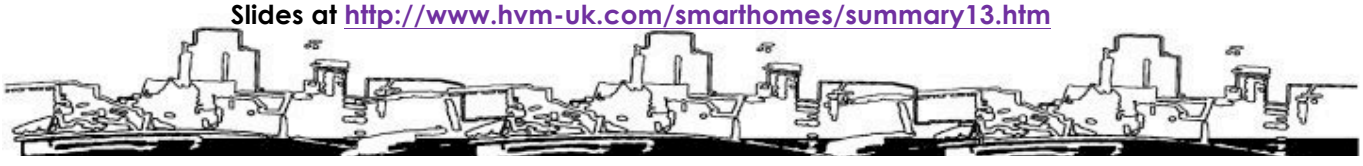
How can water be shared more efficiently and intelligently?

Heat and energy generation
Should the methane be input to the grid rather than burnt for energy?

Customers
How can Anglian Water work more effectively to reduce the usage of its customers?

Innovation
Method for conducting and implementing this has fundamentally changed in Anglian Water.

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm



Collaboration is the new buzz word.

WIN - Water Innovation Network is a good example of this collaboration.

Holistic approach from initial end of pipe to solution at source through collaboration is key element of Anglian Water's new drive.

Session 1 – DISCUSSION

How does the UK rate in terms of the competence of its smart home sector?
Lots of innovation.
US fares well also.
Less in China.
UK viewed by Nordics as very highly developed market.

With many cities becoming smarter, what plans does DECC have to utilise the data available?

Trust - How do you get people to trust utilities again?
Concept of totex. New treatment works / new pipes etc very costly and so whilst the opex may increase to improve the end goal the total expenditure would be relatively lower.

What is the extent of actually building the internet of things?
Standards and cooperation are being developed to help move from internet of silos.
How can the different communication tools be integrated together?

Session 2: iWater Technologies

Free plumber visits and fitting of free water savings devices.

Why?

Looking for innovative ways to help customers and save water.

Demand side engagement.

Lots of cleaver initiatives: Drop 20 campaign – drought reduction.

How can reducing water be fun (or just not, not fun)?

Behavioural change required.

During hosepipe ban (first in 20 years), the ban went well and awareness of why it was implemented was strong.

Many customers are now paying through a meter and more so will be with roll-out of pay-by-meter program.

Anglian Water are trying to increase the perceived value per drop which their customer's view.

Session 2 - 1 - Water & customer experience & in-house displays & devices

How can leakage be reduced?

Management of pressure is key.

Higher pressure = higher leakage rates, higher burst rates, higher costs.

Pressure is also a key part of the service which you deliver. Low water pressure = unhappy customer.

Most parts of the UK have their water distribution network split up into zones.

Very little or no automated control over pressure in localised network. It's all done manually at the site level.

This is problematic due to the variances in pressure across the network.

Each local area has its own characteristics.

Advanced pressure management

Allow you:

Visibility on pressures and flows at a very granular level at a zone level.

Allow you to remotely control pressures – at a valve level at specific areas on the network.

Allows how the pressure varies by flow to be learnt and understood.

With active pressure management the right pressure can be delivered to the customer but no more. This saves money (opex and capex) and reduces bursting and water loss through leakage.

Trial of i20's Automatic pump pressure optimisation solution had impressive results in terms of customer service improvement, energy, burst frequently and reduced total daily flow effectively also.

Session 2 - 2 - Connecting the water industry to the internet of things

Average age of pipes likely to be ~150 years old at current replacement rate.

SCADA

World made up of networks. They are all interconnected. SCADA real time operation control and automation system. People not connected as much as they should be.

Standards
Lots of them but which are most important?
How can these be condensed into those which are the most important?

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Need protocols
How can sensors and models and actuators all be interlinked effectively?
What are the communication protocols and support systems to enable enterprise integration?

Apps being developed to improve efficiency and cost savings.
Being utilised by first client: Veolia.

Existing GSM networks are not suitable for current demands.

Weightless standard (new) is looked upon to be more effective currently.

Session 2 - 3 - Under Pressure advanced management technologies

Water companies have duty to supply potable water to customers and reduce cost.

Water demand typically correlates strongly with electricity tariffs.

Storage in system may be used effectively to reduce the burden of this correlation.

How so?

By learning more about consumer behaviours and responding to the data received more intelligently.

Small area taken in east Anglia to implement the network optimisation plan.

Many constraints present in system. These are fed into the model which addresses them.

MISER is a system which is used to communicate with SCADA to deliver this capability.

Lots of data put into system:

1. Weather;
2. Water consumption; and
3. Maintenance work etc.

This allows planning ahead to be performed effectively.

Upsides:

1. Increase of reliability of supply;
2. Longer asset lives; and
3. When there are outages, these can be managed better.

Session 2 - 2 - Connecting the water industry to the internet of things

Partnered with company offering metering systems previously.

First part of trial: find out how much data was sent from meter (commonly in garden) to reader (in home). Not that effective and more so that majority (85%) have out of house meters.

Households can set targets of financial expenditure or litre usage to beat / assess their usage against.

Meters sent out to applicants.

From sample surveyed approximately 3% saving.

Will the reduction in demand be sustained?

How can the functionality of the display be integrated into other devices?

Session 2 - 4 - Weather data & automated real-time control of sewerage systems

The world is changing and so are the weather systems.

How can flash floods for example be better managed?

Currently they can be predicted but what about what is conducted when the rain has fallen?

How can pumping operations be improved?

How can the flood's impacts be mitigated?

Intelligent networks are required.

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Data must not be only collected but effectively transmitted and then managed.

Retrofitting is time consuming and expensive.

One of the mainstays of work conducted is that on weather radar data networks.

This data is then captured and fed into dashboard flagging up key events or thresholds to operators.

Session 2 – DISCUSSION

What options are there for customers to take advantage of differing costs in water supply?

Perhaps this is something which the service providers should look at and vary their prices.

Big data analysis – what is its place in the water industry – does it have a place?

YES. Absolutely. Currently not very advanced and there is still a lot of work to do. There probably needs to be more competition here. There will be competition with the suppliers which should push this forward.

One of the challenges for the suppliers is that they don't know their customers that well. They don't really understand them.
(But why is this? Surely they have had many years to collect data on typical user habits?)

How much energy is taken to get water to the customer Vs how much does it cost to heat it once there?

Non-residential consumption – how does this compare with that used by residential consumption?
Should the focus be on non-residential consumption?

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Session 3 - 1 - HEAT - Homes energy & technology

Largest share of revenue for Hitachi comes from information and telecommunication systems (~16% / 16 bn dollars)

Highly advanced vendors of integrated systems

Key areas:
1. Infrastructure Systems;
2. Information and Communication Systems; and
3. Electrical Power Systems.

Special focus on how these three areas may be integrated together.

The vision of the smart city is very difficult to realise.

Why?

Combining the information and control side is technologically challenging.

Process of providing smart community solutions evolution:

Starts at the granular level (small scale) – moves onto the larger scale.

Global smart communication activities

Widely diversified globally.

The Rokkasho village project.

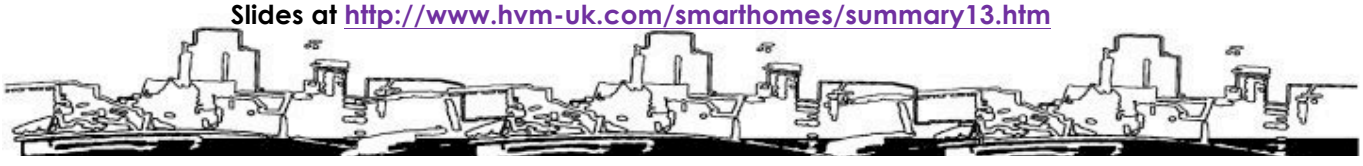
Created to identify range of different sustainable technologies required to facilitate a smart future city.

ETI smart systems and heat programme

Peak delivery improvement – challenging to deliver.

Aim: to demonstrate in five years the first of its kind Smart Energy System in the UK.

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm



Session 3 - 3 - Why 'appcessories' are hot and energy is not

Sentec are specialists in metering. High penetrations for their products.

Water meters / in home displays / completed home energy management systems.

Diverse product offering – key underling core competencies.

What is the 'use case' for the smart technology.

Key to altering usage is behavioural change. Individuals don't consume energy, they conduct tasks which consume the energy.

Consumers aren't interested in energy and they don't understand it.

How can this message be communicated positively so all can understand it?

Typically converted to a cost function though this looks like it's penalising the user.

Energy is still too cheap and reliable to result in active engagement by the populous.

Comfort and convenience typically override environmental benefits.

Do we really need smart and connected homes?

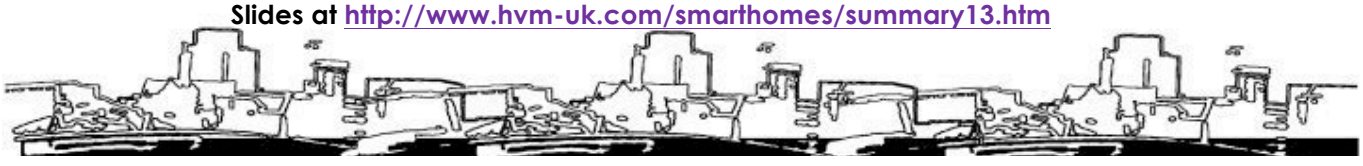
It would be nice but…

LEDs result in such low energy usage
Heat pumps would be good if they're connected but it wouldn't make that much of a different if it was
Solar panels make a large difference but connected doesn't help incrementally that much.

Is the concept of a smart connected home being pushed to engage with consumers with little actual benefit?

What are the potential markets for smart and connectedness?

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm



Pet market
Beauty market
Baby market

Why is Sentec interested in this market?

There is a large demand for functionality to manage

Why can Sentec to this well?

Experience of low power management
Have own tech to connect up devices

Session 3 - 4 - Connectivity in the smart home - Winner takes all or horses for courses

New technology company

Developed a new communications technology.

Lower cost. Firmware embeddable. Called Wattwave. Price competitive.

Claims to have unique technology.

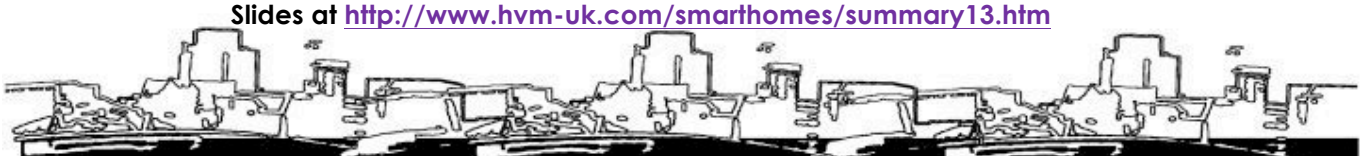
Lots of different technologies available.

One must look at:

1. Connectivity
2. Adoptability
3. Adaptions delivery

Combination of these is what will determine which is preferred for a particular application.

Does the technology need to be standardised within the home?
Probably not.



Application by application is where the decisions should be made.

The technology answer may be different and it should be based upon the outcome of evaluating cost and risk.

Use the technology on an application by application basis to ensure you identify the correct one.

Then integrate the different technologies as and when required.

Consolidation will occur.

Likely to be three categories of primary technologies:

1. High bandwith wireless;
2. Low power wireless; and
3. Long range guaranteed coverage.

Main battlegrounds:
Hubs, some will be multiplatform.

Value added will be driven at the application level and the technology MUST be able to be independent and not homogenised into one covering all applications.

Session 3 - 5 - One internet of everything to find them all and in the smart home bind them

One of the bigger challenges for the tech community is to get different technologies to co-exist.

What is the most effective way to achieve this?

What is the method to achieving this?

Internet of things = Web and API Apps specifically – device led.

Smart homes = focused on connectivity of focussed devices - machine to machine functionality is key.

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Applications in machine to machine space have range of different requirements.

The smart meter is a closed model i.e. it is not connected to the internet.

Putting radio technology into the home is a challenge. Black or grey spots for reception is challenging and tradeoffs may be required.

Multiple networks are a likely reality as different applications have differing requirements.

Many in the tech industry ask for a single standard. This is identified as 6LoWPAN.

Session 3 - 6 - Distributed energy systems. Time shifting DC & lighting load

National grid last year changed rating from 1 in 60 to 1 in 12 for major outage.

In the winter, there is a large spike in energy usage in early evening.

When energy usage is reviewed by function, some are increasing, some falling as total uses.

Consumer electronics is increasing as a total and relative to other sectors i.e. cooling the home, cooking etc.

Existing lighting circuits are being looked at to power other DC devices with meters attached allowing storage also.

Using DC allows this to be conducted at a small scale.

Smart local storage.

How to buffer the peaks which may be seen at peak times?

Grid scale storage in Germany is significant. Batteries are being utilised. A significant proportion of this in the US is being rolled out at the home level.

Development and deployment of residential installations is being conducted.

This is being funded by DECC initially.

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Moixa is partnering effectively with leaders in storage, LED, PV, local delivery and grid balancing services to be most effective at scaling.

Constant grid connectivity is identified to allow efficient hybrid power.

Through the connectivity delivered for each application, they can be treated as an aggregate resource.

This may be drawn upon locally or at a large scale.

Providers of less predictable energy production (i.e. wind power) are interested in how they may use Moixa to buy at the most efficient rates, energy which they must account for as part of their delivery package.

Time of day tariffing in the UK will help to drive these innovations.

Session 3 – DISCUSSION

Next generation of USB power goes from 5 watts to 100 watts.

Demand side management
Depending on size of the home, some 1 – 2 kwh of energy can be stored in the home. This storage may have a disproportionate effect on an energy bill resulting in savings.

Standardising of protocols
UK specific protocols are being discussed in parliament currently

Is retrofitting of existing homes leading to problems – shouldn't we be focusing on new builds?
~26 million existing homes, 150,000 homes built recently. Therefore by only focusing on new builds, the majority of the stock would not be captured and dealt with.

Session 4 - 1 - Smart Homes & IOT Entrepreneurship

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

(ARM)

Change to mobile computing is demanding greater and more effective connectivity.

Internet of things will also be huge amount of data.

Whilst the packet size may be small, with such a high number of devices, the total data flow will be very large.

Growth of IoT is focused around the different types of smart home applications.

In next 10 years, some 30% of homes with broadband will have some smart systems.

Professionally installed will likely be a key requirement of the IoT market.

ARM has strong background in IoT.

Interoperability will continue to be a key barrier and requires energy to solve problems here.

Trust is key.

Applications must trust each other and it must be sent securely.

M2M is a siloed approach.

IoT is made up of many verticle markets which individually don't really have the ability to justify the development costs associated with this siloed approach.

Sensinode.

Scalable, secure standards based.

Aim is to utilise the cloud and access the smallest of nodes.

CoAp – constrained application protocol.
Benefits from low power consumption.

This provides a 20-30 times improvement on bandwidth alone.

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Security is provided in the network drawing on other technologies.

The radio must be chosen for specific reasons and sitting above this is where cross-integration comes into play.

Users and their utilities are connected via home gateways and the internet to personal devices which depending on their functionality and intelligence provide the value proposition.

Collecting the information and sending it should be seamless. The value is added in how it's interpreted and utilised.

Users want to have convenience and save money.

Innovation is to be encouraged and ARM is enriching a number of ecosystems thorough improving interoperability.

Session 4 - 2 - Dumb homes, smart people - generational systems for LOT

More and more people will be accessing their devices and will be demanding accessibility via their smart phones.

How will this be achieved?

Currently this is conducted on the cloud.

The APIs which are out there i.e. Google, Samsung have our allegiance pledged to them.

As a consumer, we don't want to know how / why it's all working we just want it to work effectively.

Trust is specific to a particular platform.

If we think of this as feudal computing, then Google etc are the lords and the consumers are the peasants.

How do we look at our identity through the lens of greater connectivity?

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Nymote provides resilient decentralised systems incorporating privacy allowing users to retain control.

Through reviewing your operating system, one can evaluate what is actually being utilised to provide a particular service. The erroneous elements relating to the OS may then be stripped off to reduce its surface area and provide the same functionality at a much lower size.

Session 4 - 3 - A powerful platform to reduce energy cost

What is the challenge? Resource inefficiency in buildings.

Energy Deck allows you to track, save and share your consumption data.

This information is then anonymised and is available to others who can draw on this data to learn about it.

This allows the tenant and landlord to be connected effectively.

Successful rollout of the programme in the south west. An energy reduction of some 7.5% in absolute terms was achieved.

Currently bills are provided in paper form which makes the interrogation of them by the consumer much harder as were they provided electronically.

Session 4 – 4 – Empowering Smart Citizens

Focused on how people take part in the building of their homes and cities.

Worried about the prevalence of smart washing.

Too many products labelled as smart however, it is the interaction and the underlying functionality of these products to be smart which makes them smart.

Space and how people interact with it is participatory.

Why focus on people?

Engagement leads to agency

- People have a sense of ownership and are more than just users;

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Disengagement leads to apathy

- Putting security cameras on a street doesn't engage people it just results in people no longer reporting crime

Complex solutions require participation

Good business sense

- Value comes from diversity in a range of different industries

Pachube

During the earthquake in Japan, following a call, Pachube was able to generate approximately 2,000 feeds relating to radiation data.

This demonstrates the demand from people for their desire to make sense of what is happening and to allow them to track and understand it.

Installation piece in home

Designed to allow the user to determine which elements within it were connected with each other.

Participatory systems

Selfless or selfish?

How does the system as a whole get impacted when everyone is selfish?

Case is given of the plants networked across the internet. When being selfish you have the potential to kill another's plant.

When a 'kill' email is sent, the 'killer' and 'killed' are able to enter into a dialogue surrounding the reasons for the kill.

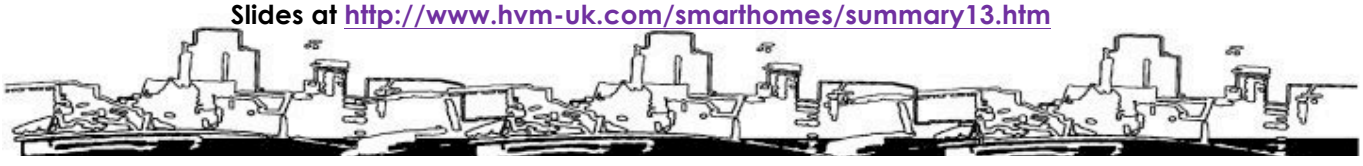
Session 4 – 5 – Smart homes at scale

Connected home platform behind many large brands.

The software developed by the company allows general trends to be built upon when the user uploads their own information to it. It then becomes tailored and specific to the user.

Initially there was no-one to be open to.

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm



The market has evolved and now there are many more potential people to share with.

One of the key areas AlertMe is focused on is how to reduce the silo working mentality.

IP web friendly world sees interoperability working currently and it does so effectively.

HyperCat

The aim is to provide a simple protocol which outlines how data should be easily browseable. This allows the service to be easily accessed and the data can then be reviewed at different hierarchical levels.

The protocol allows one to identify what levels of interoperability there are.

It allows developers to see what areas the code may or may not work for them.

The IoT and the large concept of open data needs to be effectively integrated through protocols.

In the UK, we are less than 2 years away from smart meter roll out.

EC UK – published by DECC

Electricity per home is reducing.

Critically, the type and quantity of specific usages is varying significantly.

Whilst the electricity prices are rising, our usage is falling and so the bills are rising yes, though at a lower rate.

Session 4 – DISCUSSION

Has (Pilgrim's model) been run to look forward?
No.

How do the panellists see their areas evolving and what are the bottlenecks?

Pilgrim:
The simpler they made their product, the greater the traction they achieved.

ARM Sensinode:

Striving for ease of development. At application, deployment and node side.

Nymote:
Trying to make it easier for people without decentralised servers to be decentralised which empower users. Bottleneck: adoption.

Umbrellium
Step change will come when flow of demand and flow of money changes direction. Currently the cost of all the data nodes is not feasible and so the focus must be on a service oriented function to deliver this.

(Follow-on answer from ARM)
Who is managing the deployment of a mesh network? Even where it is being offered as a service, it's frequently not integrated. Natural fit would be an NMO or an MSO.

How will this all be powered?
Is it the one which delivers the service? Those who own it? Those who use the data?

SMARTHOMES and CLEANPOWER 5 – Nov – 2013: Close and Networking Reception

Speakers SHCP 13 at Cambridge University by CiR Strategy Ltd (www.cir-strategy.com) – Synopses and Biographies provided

Programme guide

Session 1 – Introduction: Connected Intelligence, water, energy, 'things'

10:00 Justin Hayward, Director, CIR Strategy, Introduction
Biography
Justin formed CIR Strategy in 2001, an independent strategy consultancy offering diligence, market research, and the renowned 'Routes to Value' methodology. Justin worked at Deutsche Bank from 1996-2000 as a financial relative value analyst, derivatives modelling, looking at LIBOR & money market trading strategies, Euroland bond market convergence, global bond portfolios. He took an MBA from Cambridge Judge Business School in 2000/1 focusing on strategic management of technology. Through the early 2002 HVM Report he wrote for government, and the successful conference series founded that year, Justin is connected (distantly) to the foundation of the TSB HVM department, and new HVM TIC spread across the UK. Justin trained as a physicist, taking advanced degrees MMath, and PhD from Cambridge University. He was the PhD student of Professor Stephen Hawking beginning in 1991.

10:05 John Riley, Head, Digital Policy Alliance, Chairman's Opening Remarks
Biography
Dr John Riley is the new head or Secretary-General of the Digital Policy Alliance. This organisation alerts Parliamentarians and policy makers to the potential impacts and implications from new technologies such as the Internet of Things. John is strongly engaged with the IoT community, and joins the conference as Chair.

10:10 Bryan Lawrence, VP Embedded, ARM Holdings plc Lead Sponsor
Empowering Your Home: Realizing Efficiency, Comfort and Security
Synopsis
This short talk from ARM will discuss the technology challenges that we as an industry face to ensure the right framework exists for the Smart Home of the near future. This requires open, horizontal platforms, IPv6 to endpoints that include security; trust and privacy so that houses can self manage systems and services in a truly integrated way around the people that occupy their home.
Biography
Bryan has been with ARM 12 years and began his career with ARM as a design consultant assisting partners architect their own ARM based chip design. He created a small team who travelled the world promoting ARM technologies as the system level

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

solution running seminars in emerging business regions. Bryan is particularly interested in continuing to promote ARM technologies in an embedded system level solution & is looking at how ARM technology can be applied in applications related to internet connectivity like Smart Energy and Automation.

10:25 Robert Brunbäck, CMO at mobile operator Telenor Connexion AB
The Smart Home: from vision to reality
Synopsis
Robert's talk does what it says on the tin, taking the delegates through longer Scandinavian experiences of building the smart home, and the suite of services that can be bundled for consumer householders as their experience of their home is transformed. This keynote talk will be of strong interest to innovators offering niche services, but also (inter)national operators in the UK of all persuasions, be they of a telecoms, energy or TV background.
Biography
Robert Brunbäck, CMO at mobile operator Telenor Connexion AB - solely focusing global M2M / Telematics services. He brings over 10 years of experience in large-scale M2M deployments, product development and Go-to-Market strategies within sectors such as automotive, utility, building automation and cleantech. Robert holds a M.Sc degree in Marketing & Communications from Växjö University, Sweden.

10:40 Ian Ellerington, Head of Innovation, DECC
DECC Innovation Programme
Synopsis
This talk will explore the efforts of government to support particular companies in cleantech, specifically innovating in energy & homes.
Biography
An expert in energy, Ian was involved in change and project management in a career that includes stretches at Meggitt in defence projects, QinetiQ, KBC consulting, after a Cambridge education, and before joining DECC to lead innovation delivery.

10:55 Steve Kaye, Head of Innovation, Anglian Water, Gold Sponsors
Big innovation in water
Synopsis
Highlighting the kinds of innovation Anglian have been supporting, Steve Kaye will talk about Anglian's constant quest for innovation and how it can link into the new Smart Homes movement in Cambridge on November 5. Looking long-term in its 25-year strategy, the company intends to explore the possibilities for collaboration with innovators to deliver better services to water customers.

11:10 Panel with Chair, & **Marco Pisano, IntellectUK & ESCO Board Member**, followed by coffee break

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

Session 2 – iWATER – Intelligent Water Technology

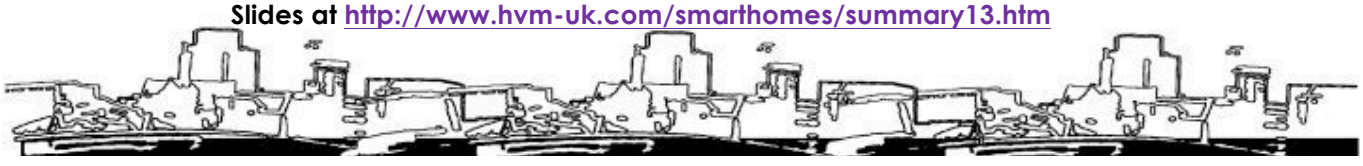
11:45 Linda Berkshire, Water Efficiency Manager, Anglian Water,
Tales of Customer Experiences
Clair Longman, Anglian Water
In-house displays & devices for water

Biography
Linda Berkshire, Water Efficiency Manager at Anglian Water is responsible for the delivery of the water efficiency target. Linda has been with the company for twenty six years working predominantly in Customer Services and Metering. As Water Efficiency Manager she has seen the role expand as water efficiency becomes an increasingly important issue in terms of the potential impact of climate change on water resources and growth within the Anglian region. Linda sits on a number of groups at a regional and national level and chairs the Anglian Region Water Efficiency Group comprising membership from Water Companies, Environment Agency and the Energy Saving Trust. The group provides a forum for discussion and action on water efficiency, metering and leakage.

12:00 Laurie Reynolds, Director, Aquamatix
Connecting the Water Industry to the Internet of Things!
Synopsis
The 4th industrial revolution is underway, focussed on using data from intelligent devices to enable understanding of the world around us. Nowhere is this more important than the water sector. The talk will summarise Aquamatix' plans to integrate sensors, wireless communications and data analytics to create an open, standards based ecosystem for the global water industry.

Biography
Laurie Reynolds has over 40 years experience as a systems engineer in water industry, Aquamatix is a specialist software integrator developing a cloud service for monitoring and optimisation of water systems called WaterWorX, and WhiteSpace Water is a startup focussed on integration of sensors with Weightless open wireless standard and award winner in 2013.

12:10 Chris Phillips, Director, i2o Water
Under pressure: the advanced, smarter way to manage the network
Synopsis
This presentation will describe how Smart Water technologies can be used to manage network pressures more intelligently and cost effectively. Examples from leading water utilities around the world will be used to illustrate the compelling ROI from Advanced



Pressure Management in terms reduced leakage, bursts, and energy consumption, lower overall opex and capex expenditure and improved customer service.

Biography

Chris Phillips is Chief Marketing Officer at i2O Water. In this role, Mr. Phillips is responsible for all aspects of the marketing of i2O's Advanced Pressure Management solutions. He works closely with water utilities and the broader water industry around the world to promote the advantages of applying Advanced Pressure Management techniques to water distribution networks. These advantages include leakage and burst reduction, operational and capital cost savings, reduced environmental impact and improved customer service. A graduate of the University of Cambridge, Mr. Phillips brings has more than 24 years of leadership experience in the technology industry.

12:20 Marcus Fowler, Tynemarch

Hands to the pump: total control software

Biography

Marcus graduated at Cambridge in electrical engineering and have since gained 20 years experience in the water industry in water resources, risk analysis and optimisation.

12:30 Dave Singerton, Wastewater Projects Manager, Anglian Water**Weather data and automated real-time control of sewerage systems Synopsis**Water Company challenges include improving operational efficiency and cost savings, sustainability, improving service levels and meeting changes in legislation. Smart sewer networks present an opportunity to help achieve these targets. To do this we need to effect real time control which requires information from factors such as the weather, flow data and pumping station performance.

Biography

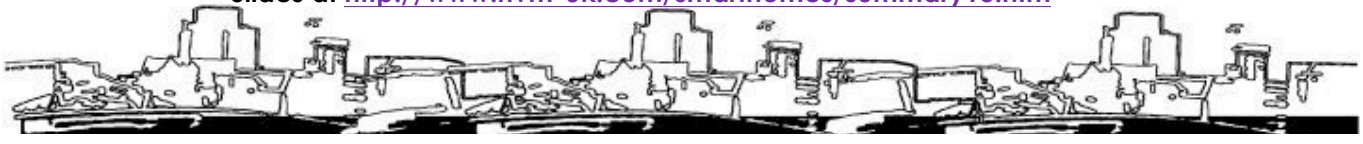
Dave is Wastewater Projects Manager in Anglian Water' Innovation team with 30 years water industry experience. I'm a Chartered Civil Engineer with an interest in combining the use of modern sensing technologies, communication networks and the possibilities for using artificial intelligence systems. 12:35 Panel with Head of Innovation at Anglian Water 13:00 Rapid Innovation Pitches CIR Strategy13:10 Lunch and joint networking with HVM Graphene Stream

Session 3 – HEAT – Home Energy & Technology

14:00 Graeme Hodgson, Project Manager, Hitachi Europe, Gold Sponsors
Smart Systems for Smart Cities
Synopsis
With 70 per cent of energy used for space and water heating there is an urgent need to find low-carbon solutions to heating our homes. Hitachi is committed to Social Innovation and we believe that with ICT-enabled integrated energy solutions we can empower the home-owner whilst cost-effectively facilitating the achievement of carbon targets. This talk will present some of our work in this area.

14:15 Andy Nowell, Head of Smart Buildings, Sentec Ltd
Why "appcessories" are hot and energy is not
Synopsis
Many people have touted energy management as the killer Smart Home app. They imagine people actively engaging with an energy management dashboard and changing their behaviour to reduce consumption. In reality, most consumers are simply not interested. This talk investigates the challenges of engaging with consumers and the growth of low cost "appcessories" which monitor things people really care about.
Biography
Andrew heads up the Smart Buildings section at Sentec. He has been involved with the design of numerous Smart Home products, from smart plugs to current clamps to full home energy management systems. Andrew is a graduate of Christ's College Cambridge in Electrical and Information Engineering.

14:30 Andy Heaton, Founder & CEO, enModus Ltd
Connectivity in the smart home – Winner Takes All or Horses for Courses?
Synopsis
As smart home technology is making the transition from bleeding edge technology for early adopters to the mainstream, the industry is beginning to address fundamental questions about technology standards, cost, reliability, supportability and usability. Such questions abound in the domain of communications technology. For makers of smart appliances, connected heating and lighting controls, sensors and other smart home products, there are many connectivity options to choose from: wireless technologies and wired alternatives. In this talk, Andy will discuss the key requirements for connectivity in the Smart Home, and his views about whether the future will be one where multiple protocols co-exist or one where a single standard dominates.
Biography
Andy is a technology industry veteran, with 28 years spent in blue chip semiconductor companies and technology start-ups in the UK and US. Operational, Engineering and Senior Management roles in Plessey, Philips, Motorola and ON Semiconductor were followed by senior roles in start-ups SiConnect, Xmos and Air Semi. He has led



organisations of thousands across the world and small design teams alike. In 2010, Andy founded enModus, a UK-based smart home start-up that had developed a break-through low bit-rate powerline communications technology called Wattwave. The company is working on bringing its technology to market in the form of low-cost OEM-embeddable modules and in its own range of Wattzo-branded smart home devices.

14:40 Russell Haggar, CEO, Xsilon Ltd

One Internet of Everything to find them all and in the Smart Home bind them

Synopsis

Connectivity in the smart home will be multifarious but invisible: whether it be Hanadu, ZigBee, Weightless, Z-Wave or GreenPHY it will work seamlessly and everywhere. The householder will get all the functionality they need, irrespective of which connection method they are using. Technology companies need to make sure that it will just work. It shouldn't require dark magic.

Biography

Russell Haggar runs Xsilon, developer of the Hanadu In-Home M2M connectivity technology. He has spent over 25 years in the comms technology industry, variously as an engineer, marketeer, investor, NED and consultant with companies such as Marconi, Madge Networks, Sagentia, Element 14 (the Broadcom one, not Farnell), Prelude Ventures, DFJ Esprit XMOS, 3Way Networks, SiConnect and Enlightened Technology.

14:45 Chris Wright, Founder, Moixa Energy,

Distributed Energy systems : time shifting DC and lighting load

Moixa Technology are underway on a contract to install the Maslow districted energy system in 300 homes. This will demonstrate the ability to time shift consumer priority loads in the home, such as lighting and IT, through buffering with energy storage. Moixa will outline the benefits to consumers (including LED lighting) and to other parts of the value chain.

15:00 Panel with **Graham Ford, Energy Entrepreneur** & Tea break

A seasoned clean energy entrepreneur and conference chairman, Graham Ford founded and was CTO of Heliodynamics, a CSP company, and has worked at top tier consultancy, as PA Consulting, and an MA from Cambridge in Engineering.

IV. Final Session – Smart Homes IoT Entrepreneurship

15:40 Adam Gould, CEO, ARM-Sensinode

Introduction to IoT for smart homes web services

Synopsis

The IoT is the next evolution of the Internet where products of all types and capabilities are connected. IMS Research forecasts that there will be 30 billion connected devices by 2020. Sensinode is a pioneer in software for low cost low power internet connected devices and has been a key contributor to open standards for IoT. Sensinode is based in

Oulu, Finland, where there is a leading technical & engineering university, but has recently been acquired by ARM. This talk gives an overview of the potential for the Internet of Things as an interoperable standards-based platform for web services, with a focus on applications for the smart home.

Biography

Adam Gould is currently VP Sensinode Business at ARM. Previously, Adam was CEO of Sensinode, a world leading provider of software for the Internet of Things. Adam has more than 25 years of experience in the wireless industry holding executive positions with Nextwave and Nokia Mobile Phones in San Diego. Adam holds more than 7 patents, and has degrees in electrical and computer engineering from Drexel University and the Massachusetts Institute of Technology.

16:00 Ben Kott, Founder & CEO, EnergyDeck

The power of sharing - or how can energy efficiency reach Google-scale

Synopsis

EnergyDeck is a web-based platform that helps organisations save energy, resources and costs. The platform is inspired by Benjamin's experience as Google's Green Business Operations manager in Europe. The ultimate goal is to bring energy and resource efficiency to a mass market by making resource consumption accessible to a broad range of users and providing an effective way to share best practices.

Biography

Benjamin Kott is the founder and CEO of EnergyDeck, an innovative web-based platform that helps organisations save energy, resources and costs. The driving idea behind EnergyDeck is to leverage the collective intelligence of users in order to provide relevant consumption benchmarks and help identify suitable savings measures. Previously, Benjamin was Google's Green Business Operations Manager and Clean Energy Advocacy Manager for Europe. Benjamin holds a degree in Aerospace and Mechanical Engineering from Munich Technical University and an MBA from Insead in France. He is a member of the sustainability advisory board of the BBC.

16:10 Amir Chaudhry, Founder, Nymote.org

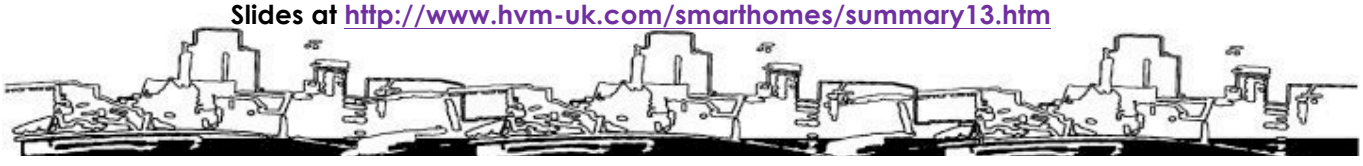
Dumb homes, smart people: generational systems for an Internet of Things

Synopsis

If the Internet of Things develops the same way as the Web then ultimately, it'll become a winner-take-all-my-data arrangement, with silos that restrict migration. Instead of smart homes, we should make smart people who are empowered to become their own digital hub. This allows new, innovative services to be enabled while putting end-users back in control of what they share. I want this to be the Internet of *my* Things, and the open-source tools from Nymote.org will make that possible.

Biography

Amir is a researcher in the Cambridge Computer Laboratory, where he works on open-source tools to enable a decentralised Internet of Things and Personal Clouds (see nymote.org). His industrial experience ranges from early-stage startups to blue chip



multi-nationals and in 2009 he co-founded the Springboard accelerator programme (now part of Techstars). Amir has a diverse academic background with an MSci in Physics and a PhD in Neuroscience.

16:20 Usman Haque, Founder & CEO, Umbrellium Ltd

Empowering smart citizens

Synopsis

The big business approach to problems for citizens often tries to solve them though technology only. This can have the effect of leaving individuals alienated. This talk by the Pachube and Umbrellium founder is a response to this problem using IoT. The Umbrellium approach is to create and deliver progressive products for enabling smart citizens to take control (for) themselves, take control of their houses, cities, and environment.

Biography

Architect & visionary serial entrepreneur Usman Haque, Usman Haque has created responsive environments, interactive installations, digital interface devices and mass-participation performances. His skills include the design of both physical spaces and the software and systems that bring them to life. Usman founded in 2008, Pachube, a platform for cloud based IoT services. Pachube was sold to LogMeIn in a deal worth around USD15mn in 2011. At the time of its sale, Pachube users send more than seven million datapoints to the service each day. This data comes from sensors, devices and environments. It is now known as Xively. Following the nuclear accidents in Japan in 2011, Xively was used by volunteers to interlink Geiger counters to monitor the disaster in real time, a project in which Joi Ito Head of the MIT Media Lab was involved.

16:40 Pilgrim Beart, Founder Director, AlertMe Ltd

Smart Home IoT at Scale

Synopsis

AlertMe Founder Pilgrim Beart FIET will cover two pertinent topics: Firstly, he will summarise some recent shifts in the Internet of Things landscape and how that is likely to help everyone's homes become Smart Homes. Secondly, following-on from his previous CIR talks on the subject, he will give an updated picture of the changing picture of UK home energy consumption. AlertMe is the leading provider of Smart Home platforms, with a focus on energy-management. **Biography**Pilgrim Beart [pron. BEERT] is a visionary serial entrepreneur whose previous companies have delivered hundreds of millions of devices into the mass consumer market. Now his current venture AlertMe seeks to empower consumers with its The evolution of the Smart Home is led by the needs of consumers.

17:00 Plenary panel with Dr John Riley, Head of DPA UK Gov, then Chair Summary and Networking Drinks Reception & Close

Slides at http://www.hvm-uk.com/smarthomes/summary13.htm

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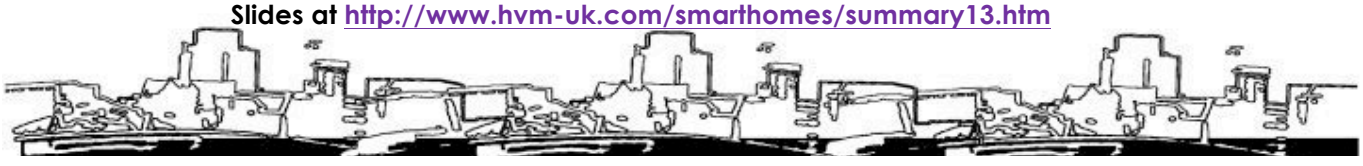

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