SAPIF 3rd meeting
Wed 06 March 2019

robustdetails®

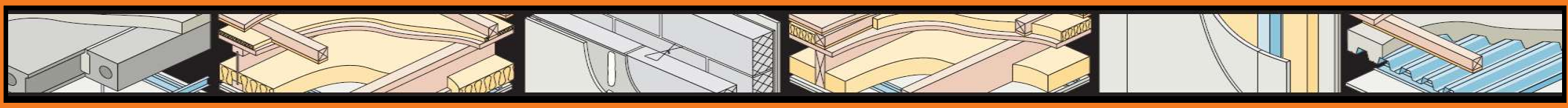
BEIS: Katy Read

BRE: John Henderson and Will Griffiths

RDL: John Tebbit (Chair) and Nick Booth

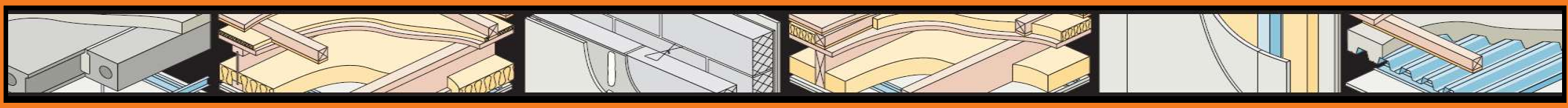
Rev 2.0
"OPEN" – anyone can view

Agenda



10.00 – 10.20	Introductions etc BEIS policy update & update on CCC report Meeting objectives
10.20 – 11.20	WGs presentations #1 (DHW), #2 (S.Controls) and #3 (H.Energy storage)
11.20 – 11.35	break
11.35 – 12.15	WGs presentations #4 (O/heating) and #5 (Vent +IAQ)
12.15 - 12.45	Q&A session
12.45 – 13.00	Summary

Introductions etc

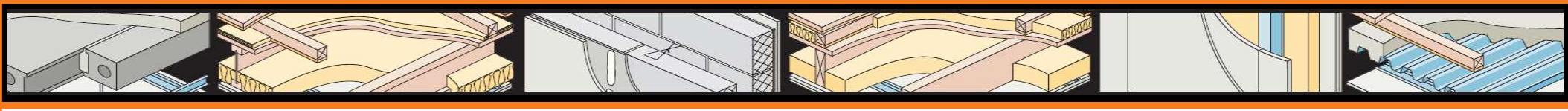


As a reminder:

- SAPIF is a joint RDL / BRE group
- This work feeds into SAP11 and for technologies that will be available in mid-2020s onwards
- 5 WGs and their respective leaders / CoLeaders identified in last SAPIF meeting
- The work of the 5 WGs will contribute toward ‘The Building Mission’
- Timeframe is end Q1 2020 for submissions
- It really is up to yourselves in industry to shape the future – your chance!! Don’t waste this opportunity.

End

BEIS – Katy Read



Clean Growth Strategy: key commitments on buildings

- Phase out high carbon fossil fuel installation
- Clean heating / Futureproofing
- Addressing the performance gap
- Innovation
- Consult on energy performance standards (Part L)
- EPC band C for existing buildings

Clean Growth – Buildings Mission

At least halve the energy use of new buildings by 2030

- Making sure every new building in Britain is safe, high quality, much more efficient and uses clean heating
- Innovating to make low energy, low carbon buildings cheaper to build
- Driving lower carbon, lower cost and higher quality construction through innovative techniques
- Giving consumers more control over how they use energy through smart technologies
- Halving the cost of renovating existing buildings to a similar standard as new buildings, while increasing quality and safety

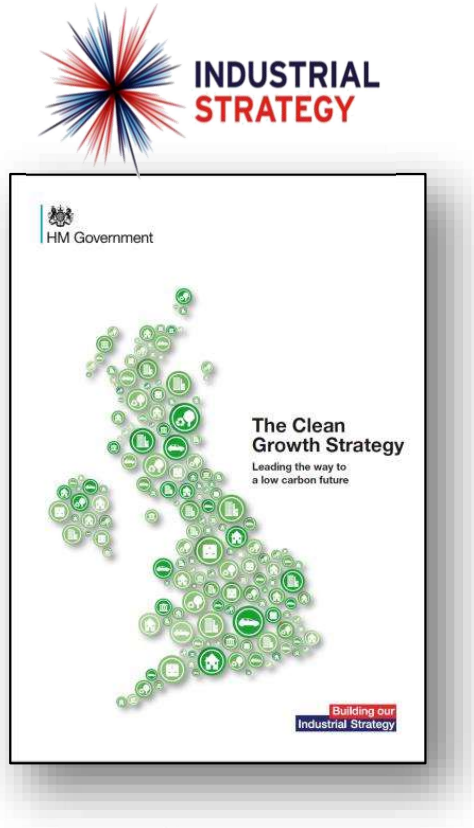
Existing homes

- We set **an aspiration that as many homes as possible will be upgraded to an Energy Performance Certificate (EPC) band C by 2035,** where practical, cost effective, and affordable.

- **Consulting on tightening standards on the private rental sector over time**, with an aspiration of Band C by 2030, and on setting an equivalent standard for social housing

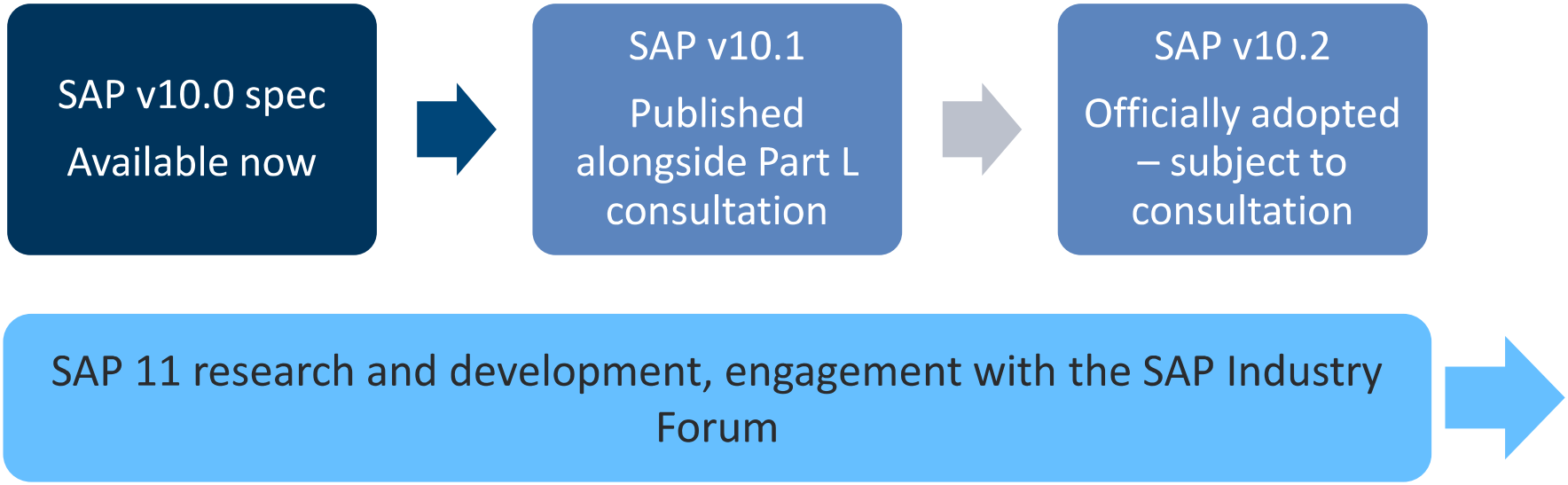
- **Extending support** for home energy efficiency to 2028 at **"at least" current level of ECO funding (£640m per year)**

- Published a Call for Evidence on 'Building a Market for Energy Efficiency' covering owner occupier sector



SAP developments

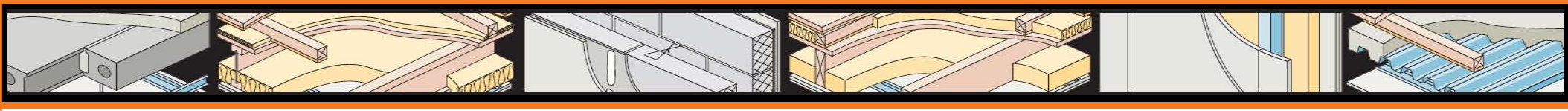
- Adoption of the next version of SAP will be included in the Part L consultation



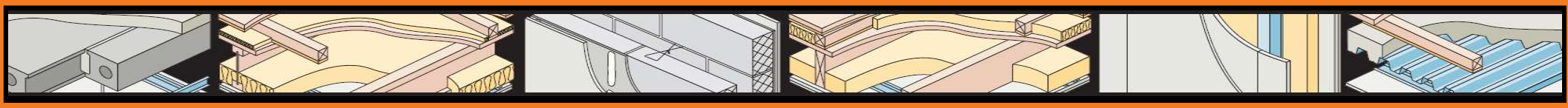
- Alongside this, we are also developing our approach to new, innovative technology recognition to help support innovation.

End

Working Groups



Working Groups' overall objectives



The main objectives for the working groups set up by SAPIF are:

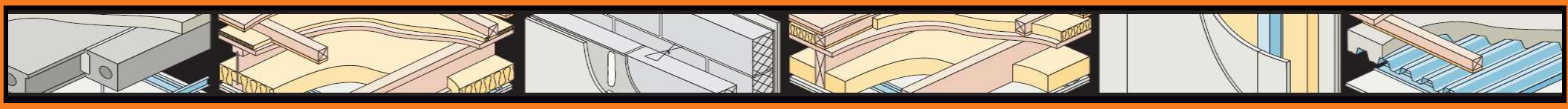
1. To establish the state of the art, sources of info. and basic explanations of the technologies/systems expected to be mature in the mid-2020s.

2. To propose some modelling criteria for the performance of the technologies; and secondly how compliance could be judged at both product and dwelling level.

3. If government decides to include recognition of the technology or system in SAP11, to work with government and the SAP contractor to develop the details. Note that the inclusion of any technology in a WG does not mean that it will necessarily be included in a future version of SAP.

- Detailed generic outputs (6 no.) for each WG issued
- Part L is <u>not</u> in scope

Working Groups



#1 Domestic Hot Water (DHW)

Steven Sutton (HHIC) and Jeff House (Building Alliance)

#2 Smart Controls, technologies & tarriffs

Colin Timmins (BEAMA)

#3 Home energy storage (heat and electricity)

Gill Kelleher (SPECIFC) and Hanae Chauvaud de Rochefort (Association for Decentralised Energy)

#4 Overheating incl prevention & cooling

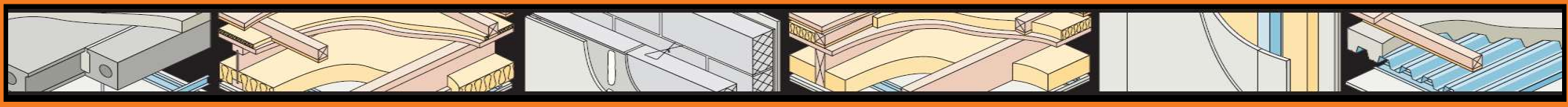
Dave Bush (BBSA) and Phil Brown (GGF)

#5 Ventilation and Indoor Air Quality (IAQ)

Nick Howlett (FETA) and Adrian Regueira-Lopez (BEAMA)

End

#1 Domestic Hot Water (DHW)



CoLeaders:

Jeff House

Steve Sutton

HHIC HEATING & HOTWATER INDUSTRY COUNCIL

SAP IF HEATING AND HOTWATER

6th March 2019

HHIC
HEATING & HOTWATER INDUSTRY COUNCIL

SAPIF Group

Baxi	Jeff House
Worcester Bosch	Ewan Sutherland
Beama	Adrian Regueira-Lopez
Ideal Boilers	Andrew Keyworth
Enertek	Paul Needley
Recoup Energy	Ian Steward
Panasonic	Steffan Cook
Vaillant	Martin Butcher, Ian Johnson
Alpha Heating	Darran Smith
Thermaq	Tony Staniforth
Glen Dimplex	Tim Altham
Advance Appliances	Geoff Egginton
Mixergy	Peter Armstrong
Sav systems	Beata Blachut, Silas Flytkjaer
Ariston	Derek Warren
HWA	Martyn Griffiths

HHIC
HEATING & HOTWATER INDUSTRY COUNCIL

Technology Categories

Technology	Methodology in SAP 10.0	Category in PCDB
Hot Water Cylinders	**Yes**	**No**
	Comment: Separate sub-category for heat pump compatible cylinders may be required to reflect heat coil transfer rates and performance. Flexibility and addressable storage significant potential	
Thermal Stores and Combined Primary Storage Units	**Yes**	**No**
	Comment: Flexibility and addressable storage significant potential	
Combi Boiler	**Yes**	**Yes**
	Comment: Methodology well established although any changes to treatment of FGHR would impact on boilers with inbuilt devices	
Flue Gas Heat Recovery (FGHR)	**Yes**	**Yes**
	Comment: Methodology may require attention to properly reflect difference between stored and non-stored design	
Heat Pumps (hydronic system feeding cylinder / store)	**Yes**	**Yes**
	Comment: Methodology well established	
Heat Pumps (exhaust air separate or close coupled cylinder / store)	**Yes**	**Yes**
	Comment: Further innovation linked to MVHR and potential comfort cooling integration	
Heat Pumps (hybrid)	**No**	**No**
	Comment: Methodology in development	
Combined Heat and Power (all types, including engine, fuel cell and others)	**Yes**	**Yes**
	Methodology for existing appliance types well represented through PAS 67, note that innovative products in development together with "add-on" types which would lead toward hybrid implementation	

HHIC
HEATING & HOTWATER INDUSTRY COUNCIL

Technology Categories

Waste Water Heat Recovery (WWHR)	**Yes**	**Yes**
	Comment: Current methodology for WWHRS needs refinement. The idea of dynamic modelling could be crucial. Showering is likely to be one of, if not the highest peak demand for domestic energy. Methodology for SAP 11 should be considering this, and recognising the technology that improves energy efficiency for DHW. This will reduce the chance of actually having to use additional backups that are more carbon intensive, similar to the ideas of the current London Plan (Lean, Clean, Green). Consideration also needs to be give for the relationship between WWHRS and other technologies. E.g. Size of domestic hot water storage required when WWHRS is present (reducing standing heat losses), or size of combination boiler required to meet DHW demand, reduction of load on Heat pumps, HIU's and heat networks. Ontario and Manitoba in Canada (over 30% of all new builds) since 2017 have made WWHRS mandatory, due to the impact it can have on DHW loads in domestic dwellings. California is now in the process of doing the same.	
Heat Interface Units (HIU)	**Yes**	**No**
	Comment: General principle of heat networks acknowledged within SAP but needs more definition and detail, CIBSE CP1 offers good guidance. Performance data for HIU's showing significant spread in market so default value treatment not appropriate. Dynamic model could include diversity assessment for central plant and efficiency benefit of such.	
Solar Thermal	**Yes**	**No**
	Comment: Possible innovation around PVT and collector design	
Solar Photovoltaic (PV)	**Yes**	**No**
	Comment: As above ref. PVT. How the generated energy will be used is the key issue for SAP with grid interactivity influencing self consumption.	
Instantaneous Point of Use Water Heaters (single and multipoint)	**Yes**	**No**
	Comment: Includes electric showers	
Storage Point of Use Water Heaters (single and multipoint)	**Yes**	**No**
	Comment: currently commonplace in commercial applications, may become more widespread with potential future divergence from central hydronic heat / DHW system	

HHIC
HEATING & HOTWATER INDUSTRY COUNCIL

Next Steps

- Group meeting 10th April
- Input from MEHNA ref. heat networks
- Discussion on overlaps and synergies between groups
- Refine technology matrix
- Define technology category templates

HHIC
HEATING & HOTWATER INDUSTRY COUNCIL

SAP developments to help support innovative technologies

- HHIC Questionnaires – based on topics below
- Replies by 22nd March

a) Make products in the Appendix Q database applicable to existing buildings

b) Raise awareness and improve communications

c) Energy Company Obligation (ECO) to support product recognition in SAP

d) Have regular reviews of EPC recommendations to include new technologies efficiently

e) Re-evaluate balance of evidence barriers, whilst protecting consumers

SAP developments to help support innovative technologies

HHIC
HEATING & HOTWATER INDUSTRY COUNCIL

- **Questions for industry:**
- Do you have feedback about the benefits/risks/implementation considerations for any of these developments?

- In particular, please provide any views on option E. Do you think this would be useful in supporting innovative technologies? How do you think consumer protection risks could be mitigated?

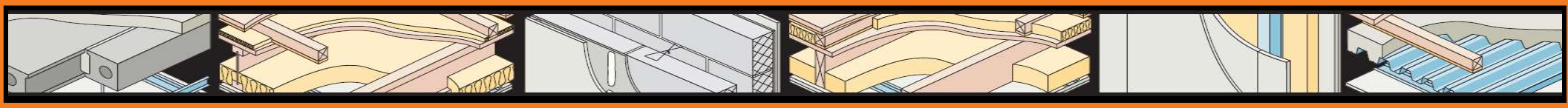
- Do you have further ideas for how SAP could be developed to help support innovative technologies?

- Do you have any wider thoughts on how to support the wider deployment of innovative technologies in buildings?

- Copy of questionnaire and responses : isaac@eua.org.uk

End

#2 Smart Controls, technologies and tariffs



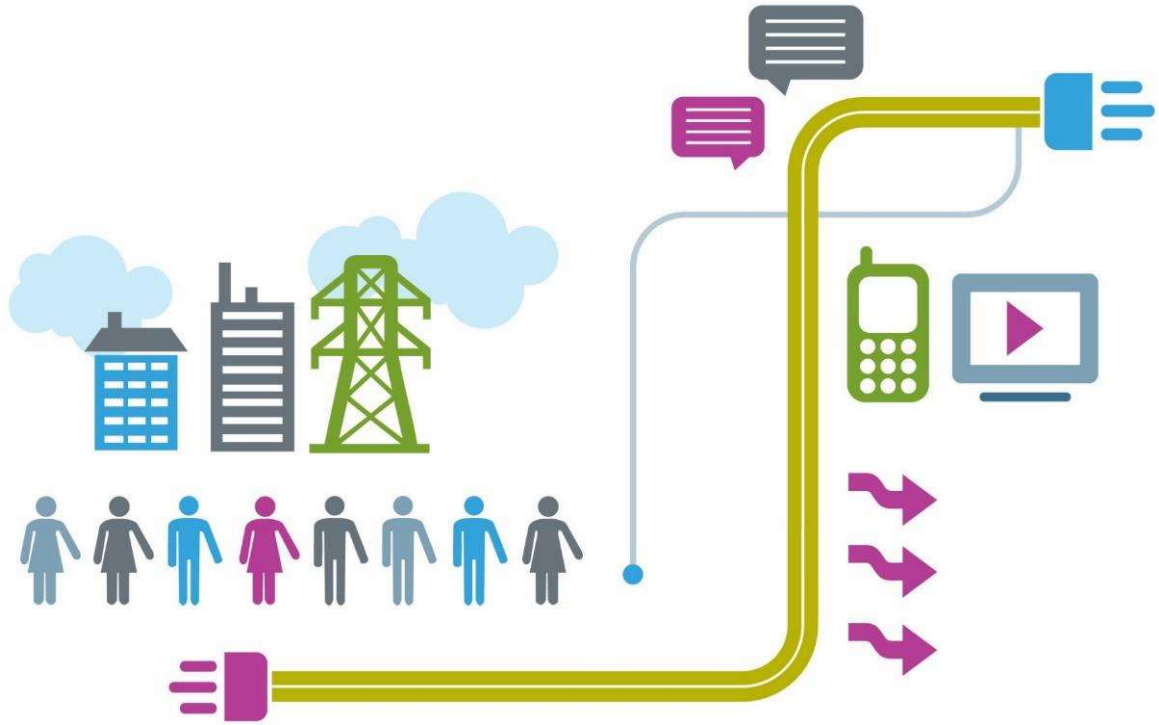
Leader:

Colin Timmins

SAP 11 Working Group

Smart controls, technologies and tariffs

Update - 6th March 2019



Group membership

BEAMA	Colin Timmins
BEIS	Philippa Hulme
Alpha	Darran Smith
Climote	Eamon Conway
Climote	Derek Roddy
Geo	Thom Wiffen
Glen Dimplex	Conor Mullaney
Glen Dimplex	Joe Hughes
HHIC	Steve Sutton
Ideal Boilers	Elizabeth Wilkinson
Ideal Boilers	Peter Millar
Nest	Alistair Chappelle
Octopus Energy	David Sykes
Resideo	Rob Whitney
Rettig	David Pittila
Schneider Electric	Dave Kempster
Schneider Electric	Ryan Howes
Somfy	Julian Cyprien
SSE	Phillip Kettless
Tech UK	Teodora Kaneva
University of Salford	Richard Fitton
Vaillant	Andrew Ireland/Mark Barson
Worcester Bosch	Chris Watling

- The calculation is independent of factors related to the individual characteristics of the household occupying the dwelling when the rating is calculated, for example:
  - household size and composition;
  - ownership and efficiency of particular domestic electrical appliances;
  - individual heating patterns and temperatures

Heating Controls in SAP 10

- Room thermostat
- Time switch
- Programmer
- Programmable room thermostat
- Delayed start thermostat
- Thermostatic radiator valve (TRV)
- Programmable TRV
- Communicating TRV
- Cylinder thermostat
- Flow switch
- Boiler interlock (gas and oil boilers)
- Bypass
- Boiler energy manager
- Time and temperature zone control
- Weather compensator
- Enhanced weather compensator
- Load compensator
- Enhanced load compensator
- Controls for electric storage heaters

Calculation of mean internal temperature for heating

Table 9: Heating periods and heating temperatures

Living area		Elsewhere		
Temperature T_{h1} (°C)	Hours of heating off t_{off}	Heating control type (Table 4e)	Temperature T_{h2} °C	Hours of heating off t_{off}
21	Weekday: 7 and 8 [a] Weekend: 7 and 8 [a]	1	21 – 0.5 HLP	Weekday: 7 and 8 [a] Weekend: 7 and 8 [a]
		2	21 – HLP + HLP² / 12	Weekday: 7 and 8 [a] Weekend: 7 and 8 [a]
		3	21 – HLP + HLP² / 12	All days: 9 and 8 [b]
	From PCDB [c]	From PCDB	If control type 1: 21 – 0.5 HLP If control type 2 or 3: 21 – HLP + HLP² / 12	From PCDB [c]

[a] heating 0700-0900 and 1600-2300

[b] heating 0700-0900 and 1800-2300. The first (daytime) off period is instead taken from the applicable database record for communicating or programmable TRVs.

[c] the length of the off periods is taken from the applicable PCDB record for the control (applies for control type 2113 and 2209)

If HLP > 6.0 use HLP = 6.0 for calculation of T_{h2}

"Other control in

HLP = Heat Loss Parameter, $(40)_m$ (W/m²K)

Agreed points from WG discussion (draft)

- Boundary condition that SAP 11 measurement will cover running cost, energy use, carbon intensity, and Primary Energy Factor.
- We need to retain the ‘ability to compare’ properties.
- These technologies may require the recognition of non-fixed appliances. (Two levels of SAP?)
- Variability in carbon intensity between day and night rates of electricity may already be possible to build into SAP 10.

Agreed points from WG discussion (draft)

- Evidence from Europe and elsewhere needs to be reviewed.
- Need to check the references to smart controls in EN15232.
- Should there be credits for installation competence to address potential technological barriers?
- Technologies could be very different so some future proofing may be needed.

Draft Technology List

- **Smart control functionalities**
  - Improvements to boiler efficiency
    - Adjusting power consumption/standby
  - Time control
    - Setting schedules to shorten heating periods
    - Occupancy detection (e.g. Geo fencing/home sensors)
    - Remote control (manual)
    - Remote control (automated)
    - Learning of occupancy patterns
    - 'Nudging' users to shorten heating periods
  - Temperature control
    - Setting schedules (e.g. setback)
    - Learning of users heating preferences
    - 'Nudging' users to reduce setpoint temperatures
    - Improving Control Accuracy (CA value)
  - Zone control
    - Setting schedules around occupancy
    - Responding to occupancy
    - Learning occupancy patterns
    - Learning occupancy preferences
  - Hot water storage
    - Learning hot water consumption preferences
    - Choosing lowest cost heat source
    - Choosing lowest carbon intensity heat source
  - Heat source selection
  - Response to different costs/carbon content
  - Use of thermal storage (hot water or structure)
  - Responding to heating source and needs of appliance (e.g. Boiler vs heat pump)
  - Automatic balancing

Draft Technology List

- **Demand side response controls**
  - DSR enabled
  - Power
  - Duration
  - Response time
  - Residential Demand Side management
  - Connected/Smart products and technologies and architecture
  - Monitoring (e.g. IAQ)
  - HCALCS
- **DSR market measures**
  - Frequency services
  - Local energy market
  - Time of use tariffs
  - Tiered
  - Half hourly
  - Flat with service coupling
  - Export market

- **DSR appliances/loads**
  - Heating
    - Gas boilers
    - Electric boilers
    - Hybrid boilers
    - CHP
    - Heat Pumps
    - Electric room heaters
  - Domestic hot water storage
  - Solar thermal
  - Thermal stores
  - Battery storage
  - Renewables
  - Microgeneration
  - Voltage optimisation
  - Electric vehicle to grid integration.
  - Smart chargers
  - Cooling
  - MVHR
  - Home appliances

Links to EPBD Smart Readiness Indicator?

Measure the technological readiness of your building

Readiness to

adapt in response to the needs of the occupant

Readiness to

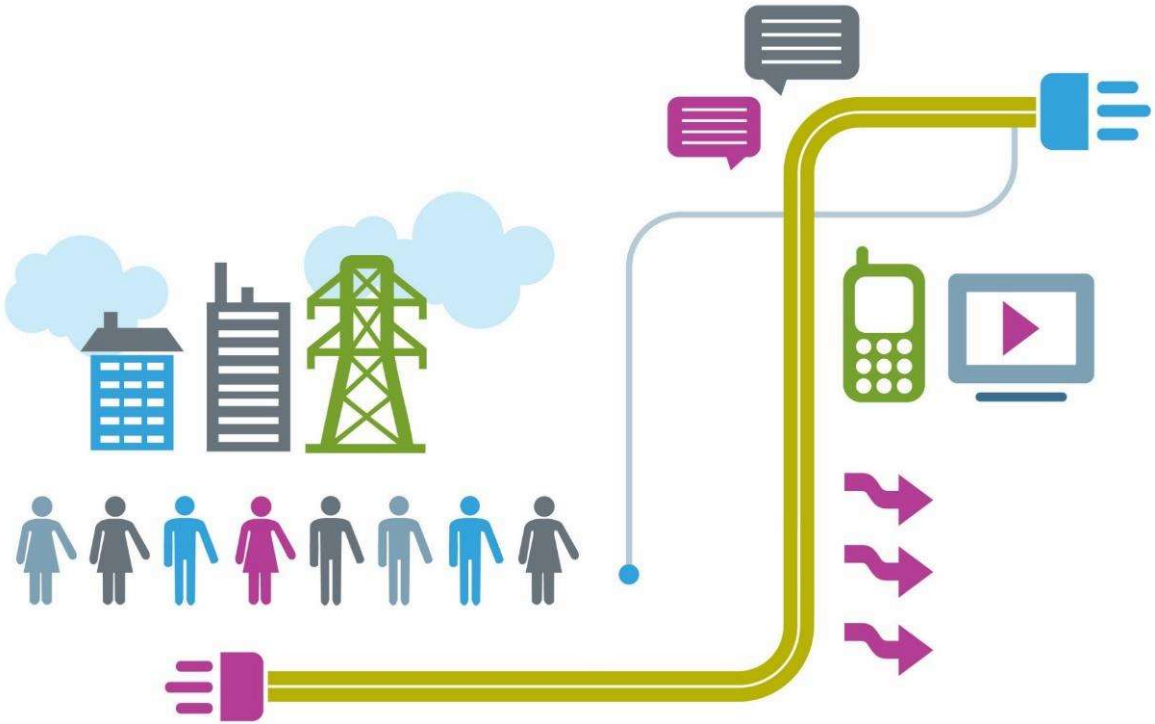
facilitate maintenance and efficient operation

Readiness to

adapt in response to the situation of the energy grid

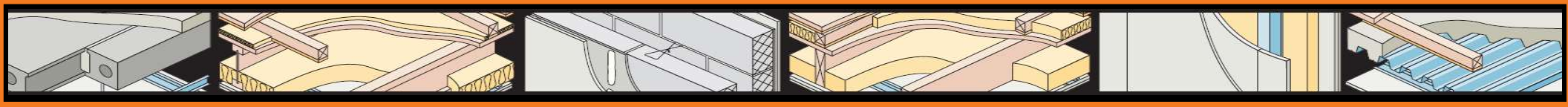
Table 3 - Example of ordinal impact scores per functionality level from Task 1

Functionality levels		IMPACTS							
		Energy savings on site	Flexibility for the grid and storage	Self generation	Comfort	Convenience	Health	maintenance & fault prediction	information to occupants
level 0	No automatic control	0	0	0	0	0	0	0	0
level 1	Central automatic control (e.g. central thermostat)	+	0	0	+	+	0	0	0
level 2	Individual room control (e.g. thermostatic valves, or electronic controller)	++	0	0	++	++	0	0	0
level 3	Individual room control with communication between controllers and to BACS	++	0	0	++	+++	0	+	0
level 4	Individual room control with communication and presence control	+++	0	0	++	+++	0	+	0



End

#3 Home energy storage (heat and electricity)



CoLeaders:

Gill Kelleher

Hanaé Chauvaud de Rochefort

SAP Industry Forum Group (SAPIF)

Home energy Storage

(heat and electricity) Working Group

Co Chairs:

Gill Kelleher - Active Building Centre

Hanae Chauvaud de Rochefort – Association for Decentralised Energy

active building centre

ade

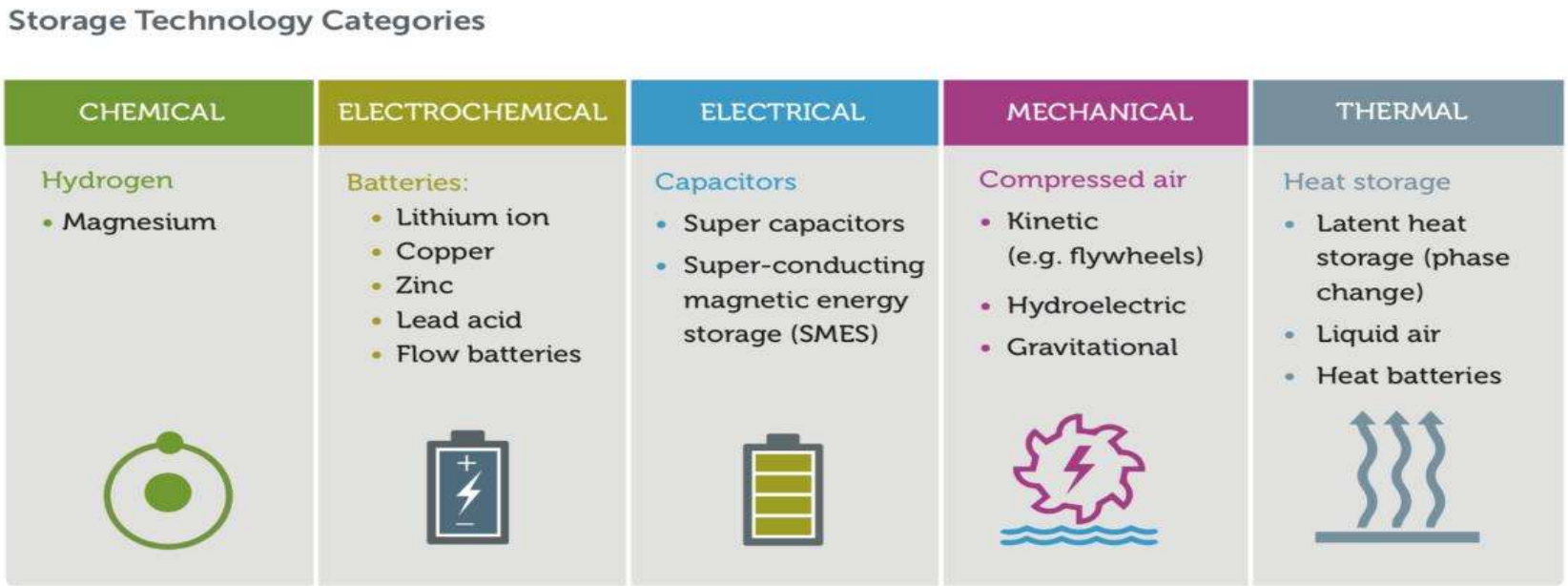
The Association for Decentralised Energy

Members/ Contributors

Organisation
Association Decentralised Energy (ADE)
Active Building Centre
BEAMA
APPG Storage (REA)
SSE
Bosch
Glen Dimplex
Engie
Moxia
Sav Systems
Geo
Contributors
SPECIFIC
Andris Bankovskis
Melius Homes Ltd
Mackintosh Environmental Architecture Research Unit Glasgow School of Art

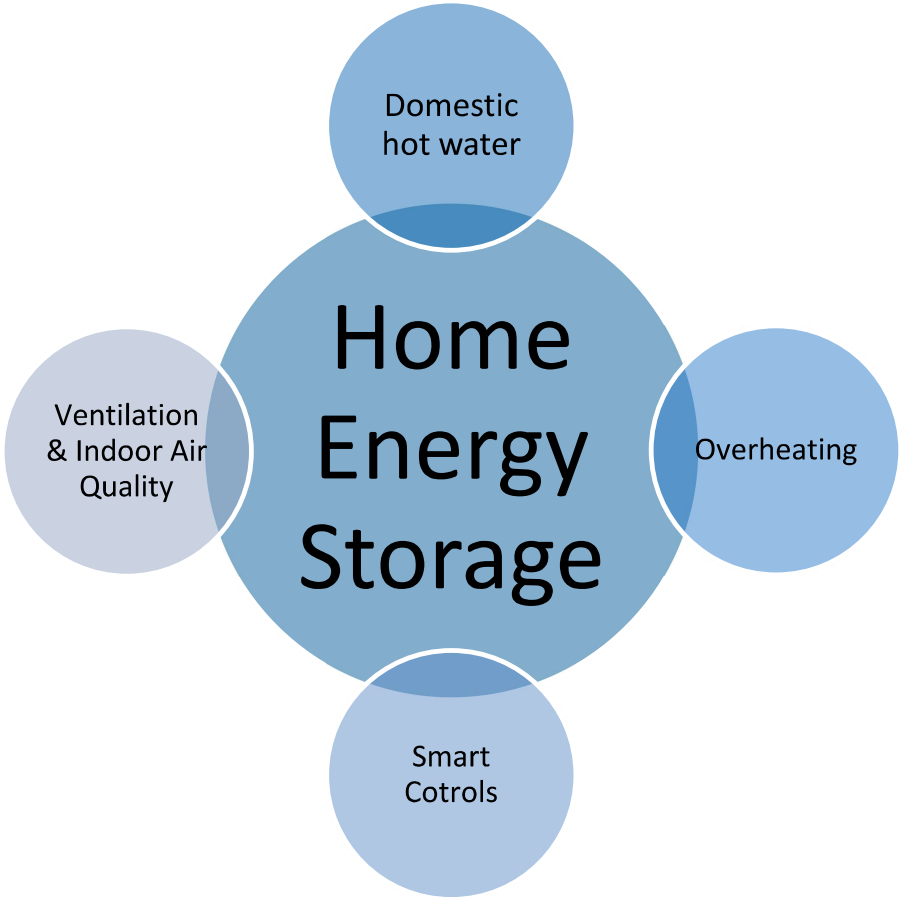
Home Energy Storage Technologies

Terms of Reference: Review the technologies for storing both heat and electric energy, from (say) one day to inter-seasonal, and from individual to district level storage; encompasses storage of heat in the ground (in both solid & liquid mediums); all types of batteries and any other technologies. Covering the following areas:



Source: BEAMA

Identified Working Scope/ Overlaps



Domestic Hot Water WG

Out of our scope: heating & storage of water

Q: Long term where are boundaries for working groups?

Smart Controls WG

Q: Pricing and costing benefits of storage?

Overheating WG

Q: Is thermal mass included in its scope?

Q: Is capturing waste heat included?

Q: Which group does heat and electricity generation fit into?

Requirements for Success

What is Requirement for success?

1 Will be maintained and developed in support of Building Regulations and other Government policies, such as those that facilitate energy efficiency improvements.

•2. SAP and the provision of SAP assessments must be sufficiently robust, providing consumer protection and minimising the risk that anticipated fuel bill savings are not achieved.

•3. To achieve this, SAP must be reactive to a changing evidence-base and continuously seek to enhance accuracy. SAP must also support the recognition of innovative energy saving technologies, where relevant, whilst maintaining a robust and impartial assessment that preserves simplicity to minimise assessment cost.'

Establish modelling criteria for the performance of technologies and how compliance judged at both product and dwelling level.

What are we measuring?

Primary Energy? How will it interact with Smart Flexible Energy Plan?

Exceed or achieve Buildings Mission 2030?

How can this capture the benefits from Active Buildings ?

When do we need it?

- March 2020
- Establish sources of information and basic explanations of techs expected to be mature in mid-2020s.
  - Produce recommendations for modelling criteria

Project Plan

Qtr 1 2019	Qtr 2	Qtr 3	Qtr 4	Qtr 1 2020
Recruit members	Working group development meetings - Overlaps			
BRE/BEIS current SAP10 workshop	Map out technology pathways	Consolidate methodology proposals	Establish draft Recommendations	Deliver Recommendations
	Part L Review			

Questions and views welcome!

- Are we missing anything?
- Other groups we could speak to?
- Would you like to sign up to the Home Group?
- Please get in touch!

hanae.derochefort@theade.co.uk

gill@activebuildingcentre.com

Examples

specific®

Working Definition of Active Buildings

"a building which integrates solar generation and storage technologies for both electricity and heat within its construction, rather than being heated by gas, and which is controlled by an intelligent system to optimise energy management and comfort for inhabitants. Active Buildings aim to be net energy generators, and have the potential to utilise the surplus energy to trade"

Industrial Strategy Challenge Fund, Transforming Construction, March 2018

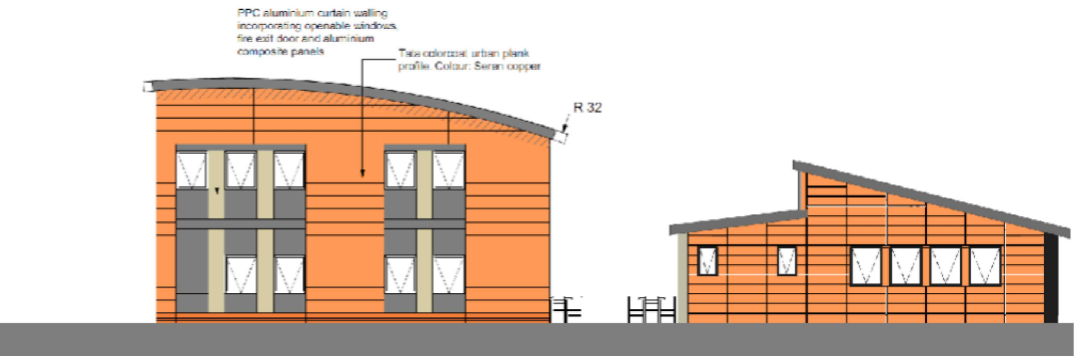
Technology Examples: Active Homes Neath

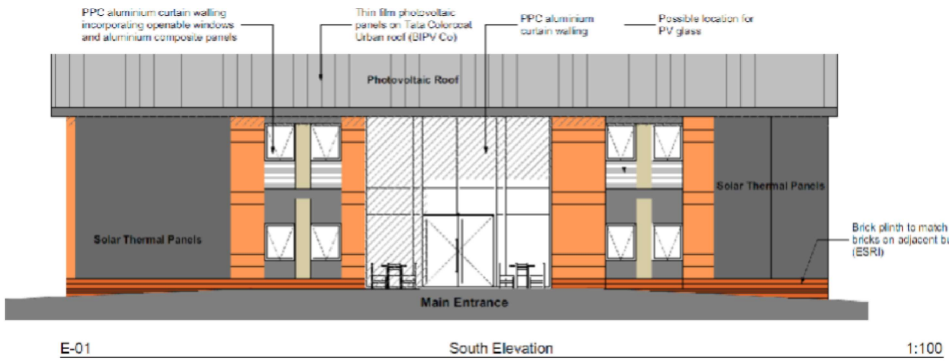
- Pathfinder project to demonstrate homes as power stations at scale
- User friendly with affordable warmth in mind
- Running costs £600 – £900 per year. Approx. 50% of equivalent
- Fabric first with solar strategy for heat and power
- Design and build contract
- Onsite now, completion summer 2019

- Affordable Housing Review
  - Standards for affordable homes – building regs
  - Incentives – linked to council tax?
  - Affordability should include energy costs
- Buildings which share energy
- Energy as a service

Active Office

- Fabric first
  - Proven envelope – reduced thermal demand
- Combine solar thermal & Solar PV – with metering
- Integrated Vehicle charging
  - Chargers for excess solar
- Thermal Store – ability to timeshift heating demand –
  - Classroom heating demand is same as any other building
- Flexibility and option for thermochemical store at a later date

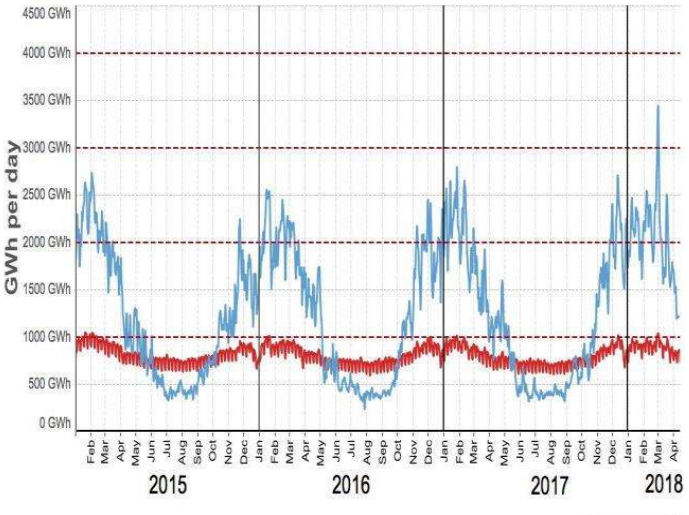




Decarbonisation of Heat

Opportunities

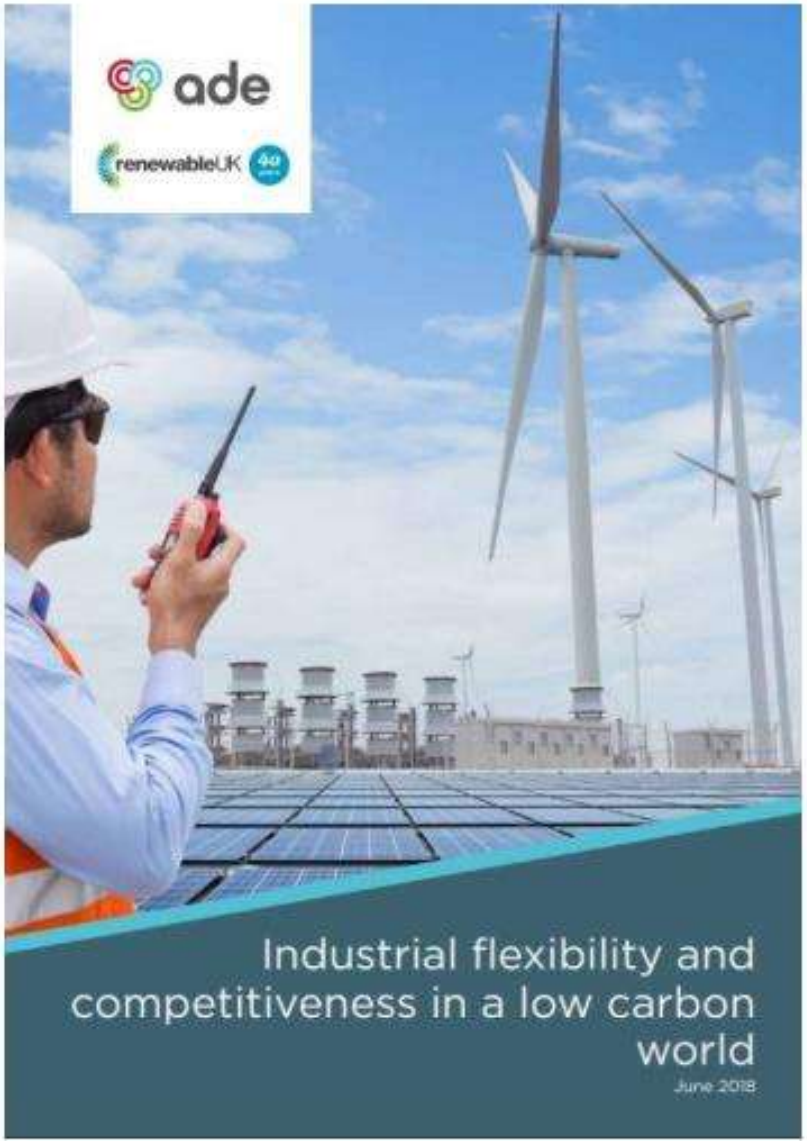
- Thermo-chemical storage at SPECIFIC
- High energy density when compared to water storage
- Allows for industrial heat recovery
- Industrial and automotive trials underway
- Peak summer time generation can be used in winter
- Great retrofit potential



Example of ADE activity: An energy productivity coalition

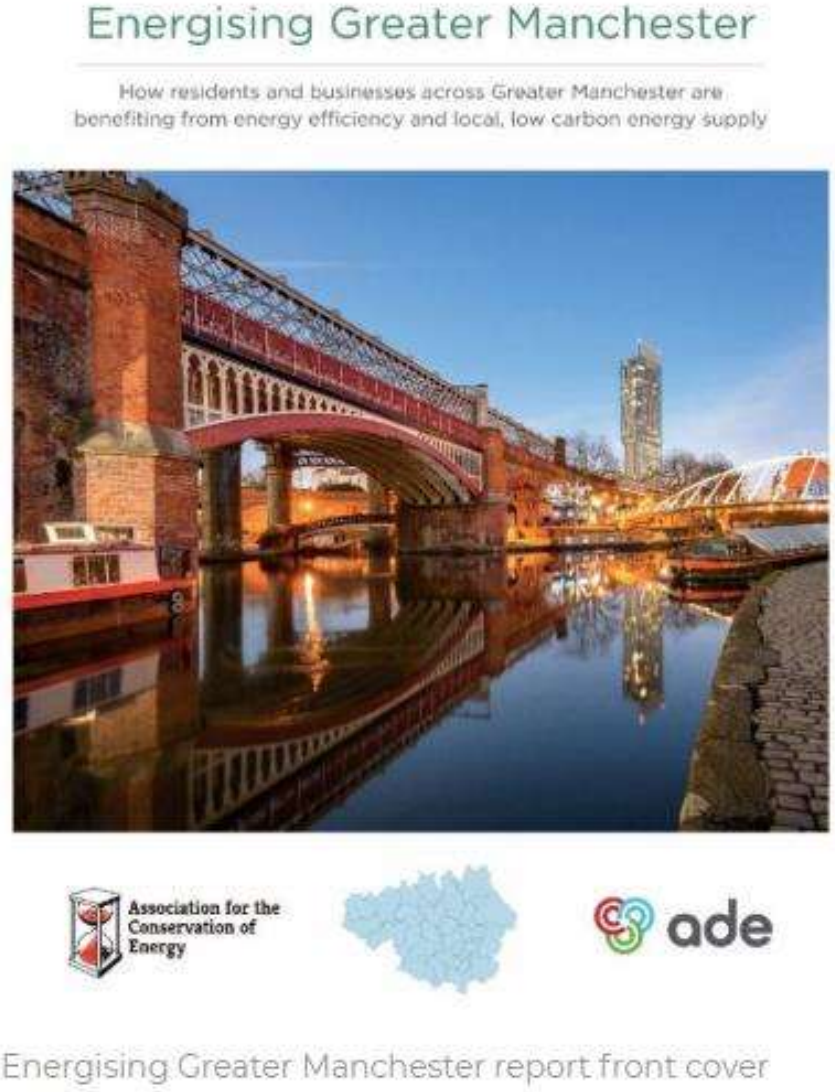
The 2016 UK Energy Productivity Audit, published ahead of the launch of the Government's discussion paper on its Industrial Strategy, outlines a strong case for putting energy productivity at the heart of its review.

Example of ADE activity – Partnership with Renewable UK



- To highlight how decarbonisation can boost industrial competitiveness
- Challenge for the System Operator and renewable generators in keeping a balanced grid
- Users can provide flexibility in many ways, including by changing their usage behaviours, using on site efficient generation and/or through battery storage technology.

Example of ADE activity - ACE Research Manchester Local Energy Story

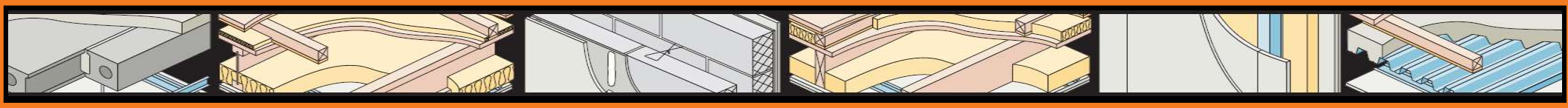


Energising Greater Manchester report front cover

- To reveal how residents and businesses across Greater Manchester are benefiting from energy efficiency and local, low carbon energy supply
- Greater Manchester has set itself an ambitious challenge to be carbon neutral by 2040
- 903,000 significant upgrades to home efficiency since 2005, potential to upgrade a further 800,000 homes which have Energy Performance Certificate (EPC) ratings of D or lower

End

#4 Overheating including prevention and cooling



CoLeaders:

David Bush

Phil Brown

SAPIF:
Working Group #4

David Bush – British Blinds and Shutter Association
Phil Brown – Glass and Glazing Federation

Working Group Members

VELUX®

Neil Freshwater

GGF

Phil Brown

BBSA®

BRITISH BLIND & SHUTTER ASSOCIATION

Dave Bush and Zoe De Grussa

HBF

HOME BUILDERS FEDERATION

Matthew Hurd

Plasmor

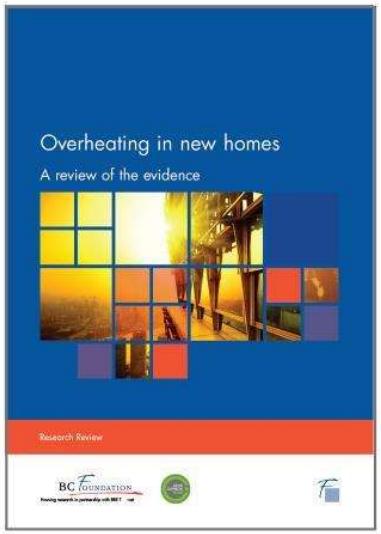
CONCRETE PRODUCTS

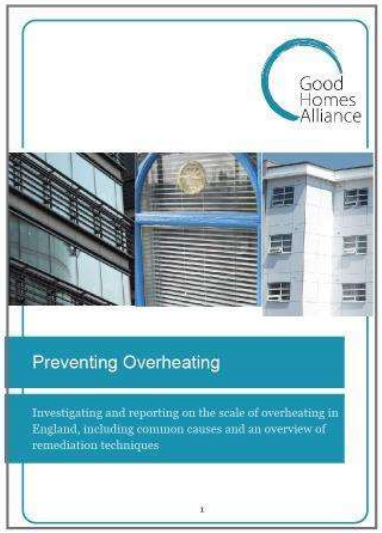
Jodie Evans and

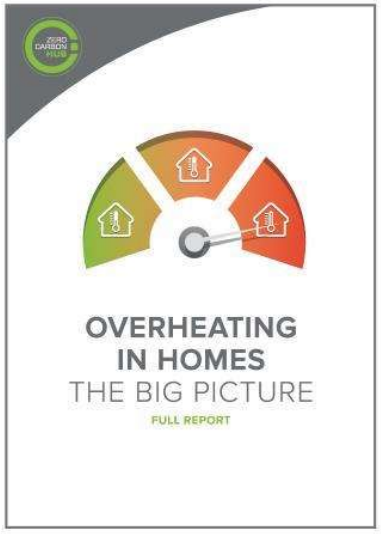
Owen Gallagher

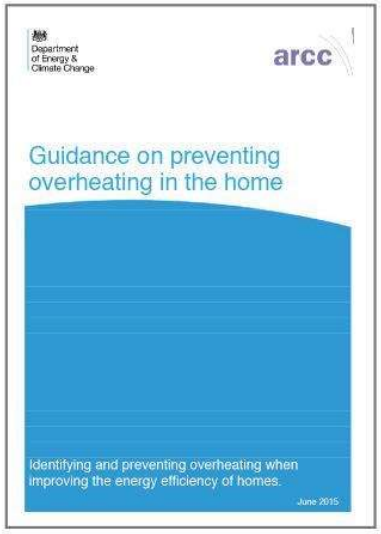
So far…

- Two Meetings between members.
- Outlined technologies that are available that can prevent overheating risk.
- Started creating a ‘working’ overheating context document about the reasons for overheating and recognised mitigation methods.
- Created a Dropbox for all members to access and compile evidence.
- Identified areas in the group where we do not have expertise.

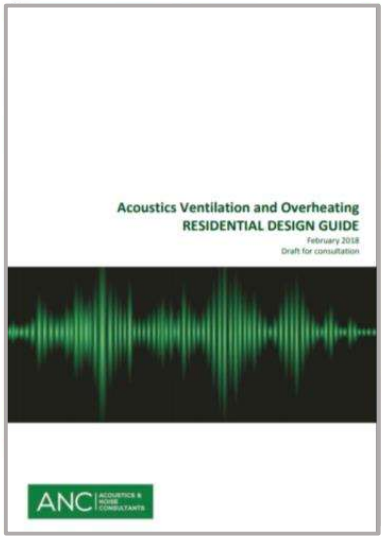


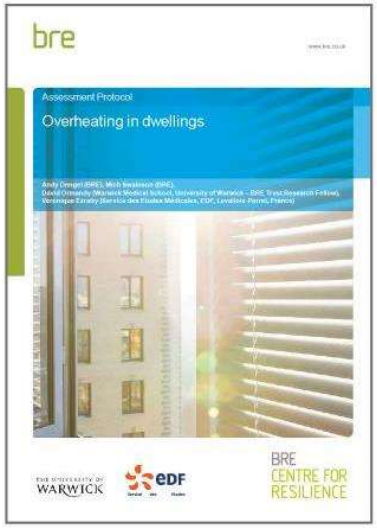


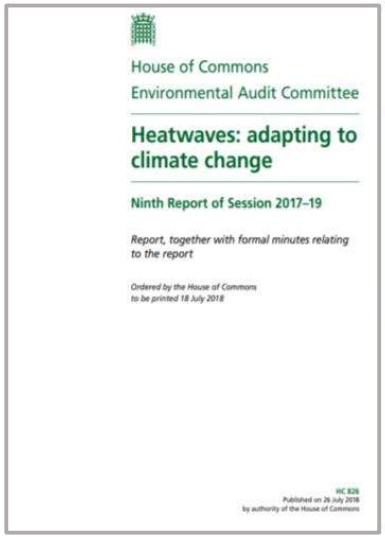




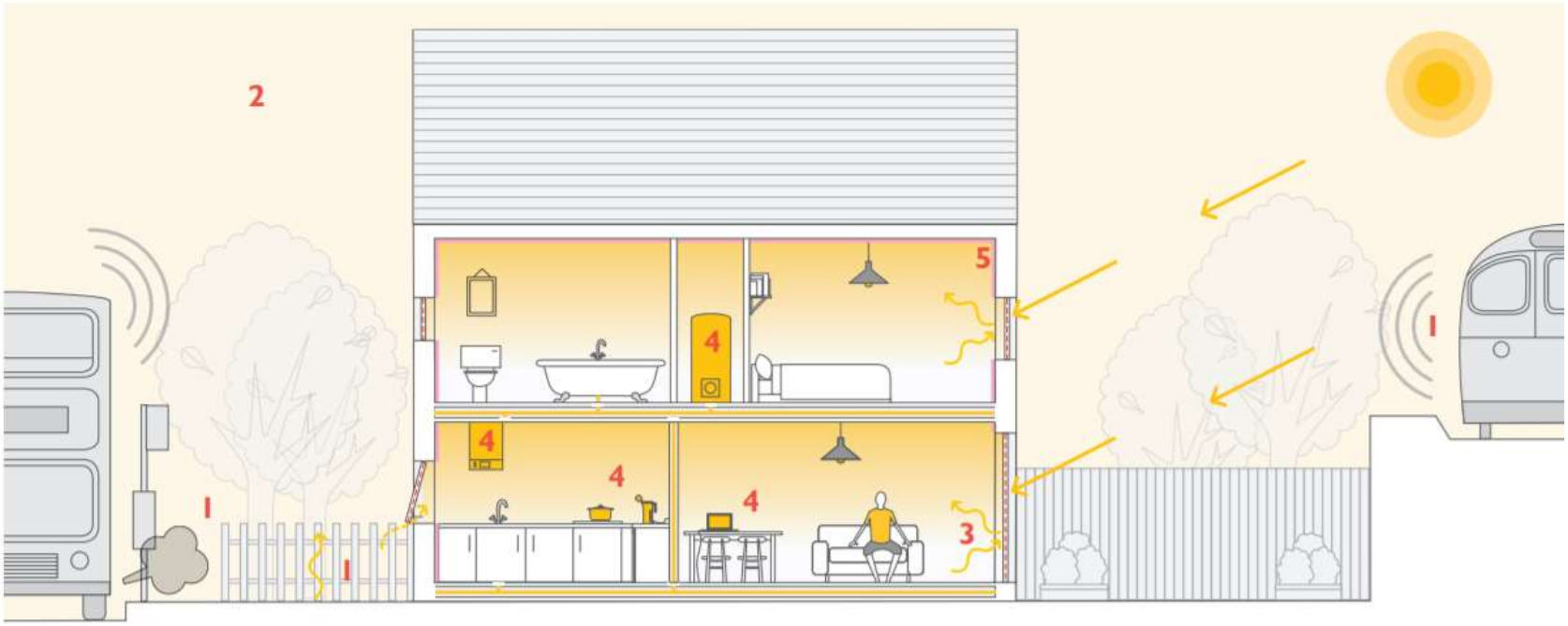
Well documented that **overheating** is a problem!







It’s a combination of factors that contribute to overheating!



1. Site Context =	Dynamic Modelling Approach needed that considers realistic and future External Air Temperatures and potential Noise & Air Quality Issues.
2. Higher External Air Temperatures =	Requirement for better ventilation.
3. External Heat Gains =	Improved façade/building design (Thermal Mass, Glazing & Shading).
4. Internal Heat Gains =	Requirement for better ventilation.
5. Fundamentally it comes down to…	**Poor building design that doesn’t work holistically or consider variability in occupant behaviour!**

INDEPENDENT

News › UK › Home News

Extreme summer temperatures will soon cause deaths of up to 1,700 more Britons a year, says government report

The new figures are on top of the 2,000 people a year who currently die from heat-related illness in Britain

Jonathan Owen | Saturday 30 May 2015 20:45 BST | 0 comments

1 shares

Like Click to follow The Independent Online

The Telegraph

"Hospitals at increasing risk of overheating due to climate change"
- July 2014

MailOnline

"Overheating blamed for increase in cot death: Parents warned against keeping their babies too hot at night"
- 20th August 2015

itv Live TV Shows Categories News

NEWS Top stories Your area Topics Sport Weather

itv NEWS

ITV REPORT 3 March 2017 at 2:54pm

Have you heard about overheating homes?

BBC RADIO 4

New Technologies to reduce Overheating Risk...

- Dynamic Glazing
  - New Products: Suspended Particle Device
    Thermochromic
    Polymer Dispersed Liquid Crystal
    Electrochromic… among others.
  - Improved Fabric Performance Data.
  - Considered in relation to more accurate site contexts.

- Dynamic Shading
  - New Products: Automated and Manual Motorised Systems.
    Improved Fabric Performance Data.
  - Improvement on use of products through automation and motorisation.
  - Energy Balance Approach considered across Summer and Winter.
  - Considered in relation to more accurate site contexts.

- Thermal Mass

- Energy Generation
  - New Products: Building-integrated photovoltaics

- Ventilation
  - New Products: Mechanical Ventilation Heat Recovery (MVHR)
    Accurate Natural Ventilation
  - Considered in relation to more accurate site contexts.

Gaps in Working Group

- Building Simulation Methodologies
- Acoustics (External Façade Panelling combined with ventilation)
- Ventilation and Indoor Air Quality
- Case Studies of buildings where all or a combination of outlined technologies have been considered.

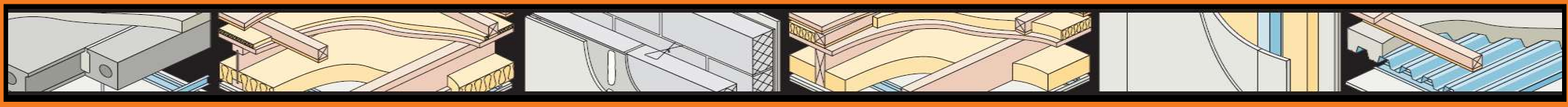
Questions from Working Group

- Has it been confirmed whether a Dynamic or Static Simulation Method will be used to improve the Overheating Assessment?

Thank you for Listening

End

#5 Ventilation and Indoor Air Quality (IAQ)



CoLeaders:

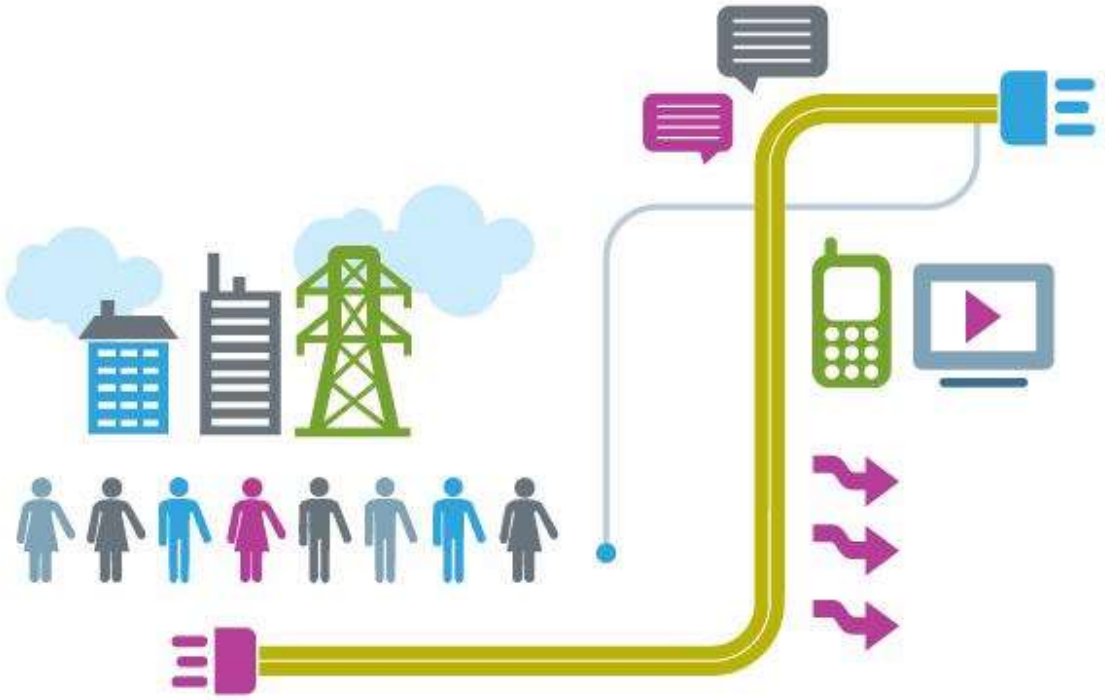
Adrian Regueira-Lopez

Nick Howlett

IAQ AND VENTILATION WG

SAP INDUSTRY FORUM

MARCH 2019



OBJECTIVES

- To establish the state of the art of the technologies/systems coming in the mid-2020s.
- To propose some modelling criteria for the performance (and compliance) of the technologies identified.
- To work with government and the SAP contractor develop this further, if necessary.

SCOPE

- New control systems that directly address air quality e.g. VOCs, CO, CO2, NOx, humidity are within scope.
- Do not conflict with Part F!

MEMBERSHIP

- Mainly ventilation manufacturers:
  - AERECO
  - AIRFLOW
  - BEAMA
  - ENVIROVENT
  - FETA
  - NUAIRE
  - TITON
  - WEST ENERGY
- Further members welcome

MEETINGS

- Introductory meeting – February 2019
- Next meeting scheduled for beginning April 2019

VENTILATION IN SAP

- Ventilation is covered in the following aspects:
  - Air permeability (and heat recovery)
  - Energy efficiency and energy use
  - In-use factors (insulation, ducting, installation…)

- Ventilation controls are not covered (scope)

VENTILATION IN SAP

- Ventilation technologies make little impact on SAP ratings
- Continuous ventilation not particularly encouraged (especially after SAP 10 changes)

Comparison of SAP Examples					
SAP Example	**DER**	**SAP Rating**	**Primary Energy**	**Space Heating Demand**	**Pumps and fans**
System 1	18.79 kg/m^2	82 (B)	102 kWh/m^2	7898 kWh	86 W
PIV (loft)	18.79 kg/m^2	82 (B)	102 kWh/m^2	7898 kWh	86 W
PIV (outside)	19.26 kg/m^2	78 (C)	108 kWh/m^2	7168 kWh	1022 W
MEV (PCDB)	18.66 kg/m^2	81 (B)	102 kWh/m^2	7658 kWh	224 W
dMEV (PCDB)	18.43 kg/m^2	82 (B)	101 kWh/m^2	7658 kWh	86 W
MVHR (inside, Level 1)	17.56 kg/m^2	81 (B)	98 kWh/m^2	6449 kWh	642 W
MVHR (inside, Level 2)	18.12 kg/m^2	80 (C)	101 kWh/m^2	6824 kWh	642 W
MVHR (outside, insulated)	19.78 kg/m^2	79 (C)	110 kWh/m^2	7935 kWh	642 W
MVHR (outside, not insulated)	20.83 kg/m^2	79 (C)	115 kWh/m^2	8753 kWh	542 W

VENTILATION – STATE OF THE ART

- Natural v. Mechanical
- Continuous v. Intermittent
- Positive v. Balanced v. Negative
- Centralised v. Decentralised
- Manual Controls v. Automatic Controls
- Central Controls v. Local Controls
- With pre-heating
- With filtration
- With heat recovery
  - MVHR
  - Integrated with a heat pump

Not all possibilities are covered!

VENTILATION – FUTURE TECHNOLOGIES

- Marginal efficiency gains
- IAQ and Health
  - E.g. Outside air filtration technologies
  - Impact on energy performance may need consideration in SAP
- Ventilation controls
  - Air flow variations between minimum and maximum
- Connectivity
  - Internet of Things
  - Remote control
  - Internet-connected
- + Part-F driven

COMPLIANCE AND SURVEILLANCE

- Government's compliance and surveillance checks need to be enhanced.
- The importance of the 'compliance gap' has recently been acknowledged by the CCC as a very important step to achieve buildings fit for the future.
- This is particularly important for ventilation

IAQ & VENTILATION WG - BARRIERS

- Part F revision underway
  - It will have an impact on the future of the industry
- Energy efficiency v. IAQ
- Conflict with individual manufacturer's own product development projects

IAQ & VENTILATION WG - OVERLAPS

- Ventilation plays a role in overheating
- Ventilation may be used to alleviate overheating risks

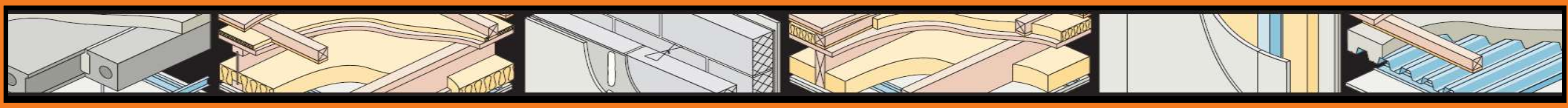
Comparison of SAP Examples					
SAP Example	**Overheating risk - June**	**Overheating risk - July**	**Overheating risk - August**	**DER**	**SAP Rating**
Baseline	None	None	None	18.79	82 (B)
Windows slightly open	None	Slight	Slight	18.79	82 (B)
Trickle vents only	Slight	Medium	High	18.79	82 (B)
Trickle vents + Cross Vent	Slight	Medium	Medium	18.79	82 (B)
MVHR (inside)	Slight	Medium	Medium	17.51	81 (B)
MVHR (outside)	None	Slight	Slight	20.83	79 (C)
High air permeability	Slight	Medium	High	19.56	81 (B)
Low thermal mass	Medium	High	High	18.41	82 (C)
High thermal mass	Slight	Medium	Medium	19.59	81 (B)

IAQ & VENTILATION WG – NEXT STEPS

- Feedback from SAPIF meeting
- Learn from other WG approaches
- Next meeting in April 2019

End

Summary



The overall objectives:

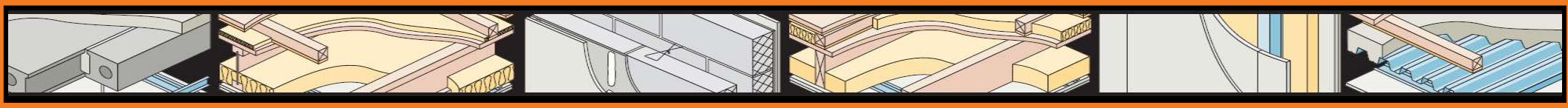
1. Initial awareness
2. Publicise each WGs work + opportunity to contribute.
3. WG overlaps and interfaces with other WGs
4. End Q1 2020 and Part L is out of scope

Key aspects:

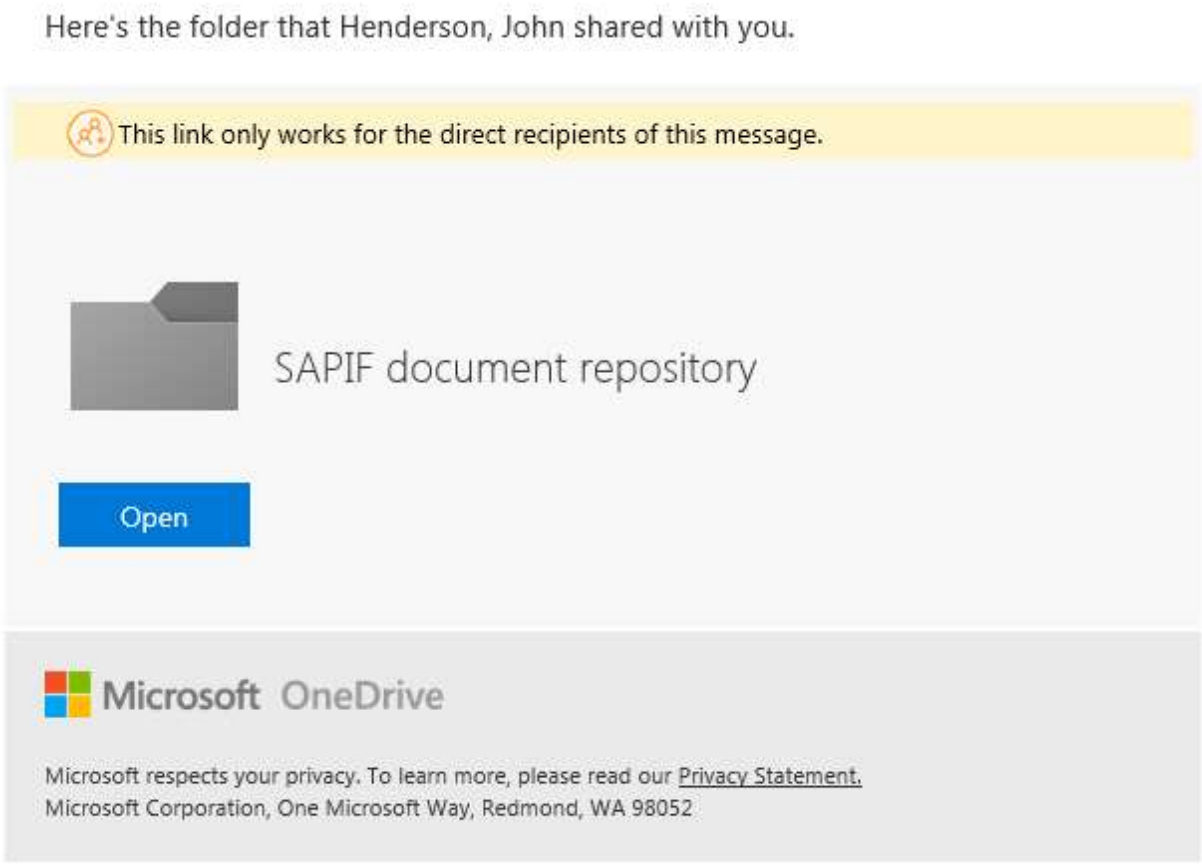
- For SAP 11
- Complete end Q1 2020
- New technologies - available in mid-2020s onwards
- Performance Modelling criteria and how judge compliance

End

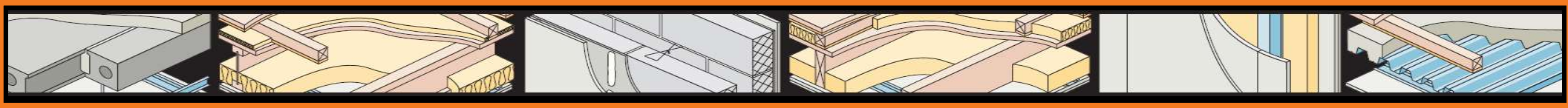
SAPIF WGs' Data Store



- Shared SAPIF folder with subfolders for each working group
- You'll receive a link in an email from John Henderson looking something like this:



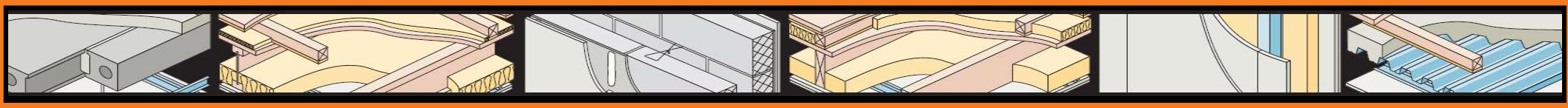
SAPIF WGs' Data Store



- Access is limited to named recipients of the link (SAPIF members)
- Simplest way to access the folder is to click on this link each time
- If you are asked for a password, that is your own email password – not one set by BRE / RDL / BEIS (so don't ask us what it is!)
- Should all 'just work', but let us know if any teething problems that you think are not fixable at your end

End

The next steps



What would you like ……

What is the timeline …..

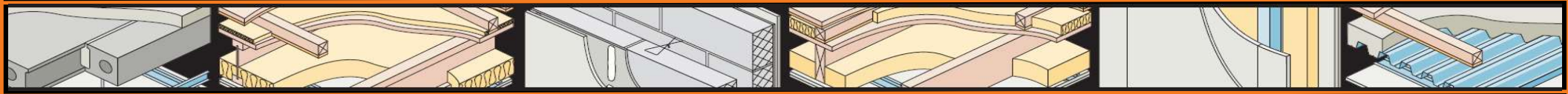
What are the outputs ….

Future SAPIF meeting(s) …. Objectives ….

June / July	Leaders / CoLeaders only	“Are we all OK?”
October	Open to all	“How are we doing?”
January 2020	Open to all	“Last chance before handover”
March 2020	Leaders / CoLeaders only	Presentation of findings

End

thankyou



www.robustdetails.com