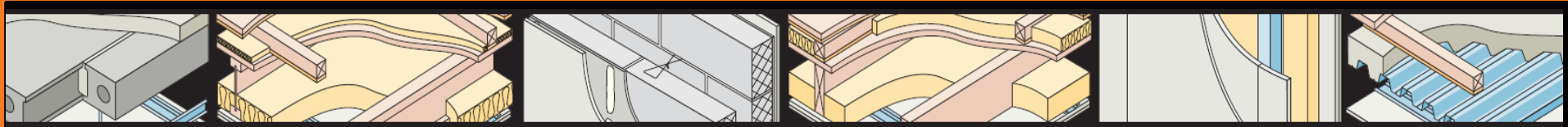
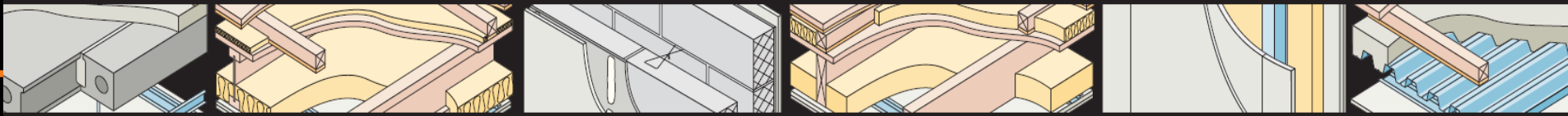


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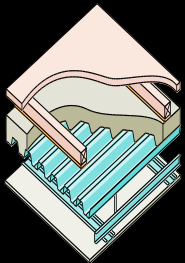
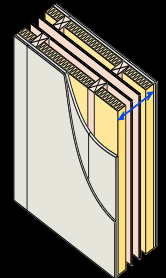
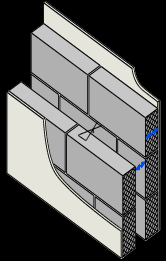
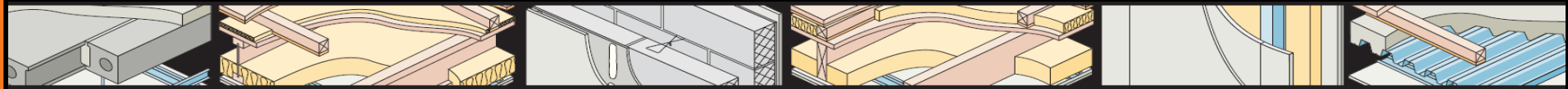
John Tebbit
Managing Director

Making SAP fit for the future



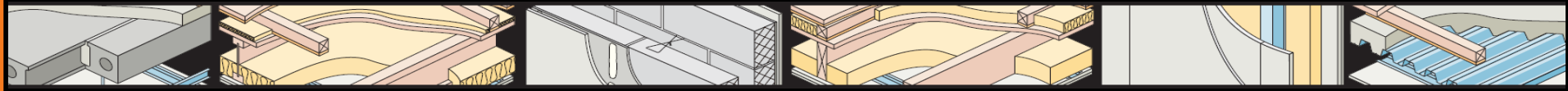
Possibly an offer you cannot refuse

Agenda

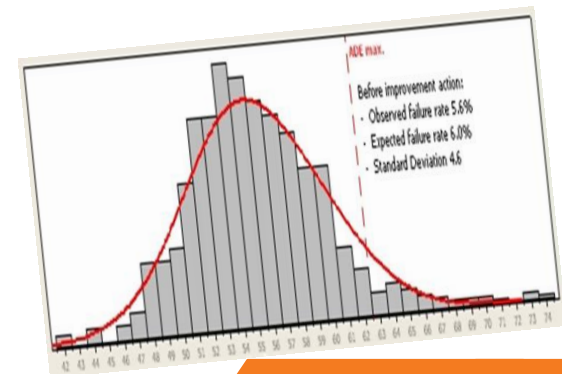
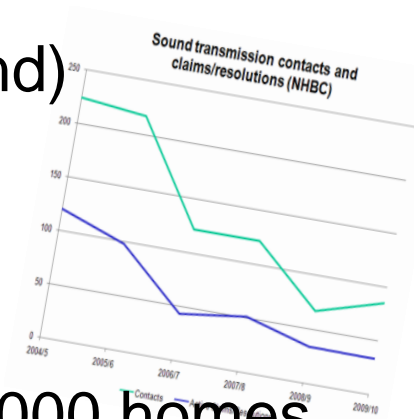


- Overview of the industry
- What SAP is
- Some issues with SAP
- What we need from SAP
- Ideas on getting there

Overview - RDL



- Set up to help industry meet new Part E (Sound)
- Old Part E compliance 60%ish, now over 99%
- NHBC E1 contacts down by 55% (2004-2010)
- Database on tests and inspections of over 26,000 homes
- Pattern book with over 60 designs
- Self funding, reducing risks for all parties



House building - 2014



- £19.2bn output
- Just under 19% of all construction output
- £2.1bn profit for top ten builders
- 140,930 homes completed (2013/14)
- Around 600,000 jobs
- 233,000 directly employed



Energy performance



- Zero Carbon Hub work on the 'performance gap'
- A real gap exists between as-designed and as-built
- And what we thought we designed and what was designed
- SAP audit showed 26% error caused by wrong input data
- Probably leading to optimistic performance assumption

IN

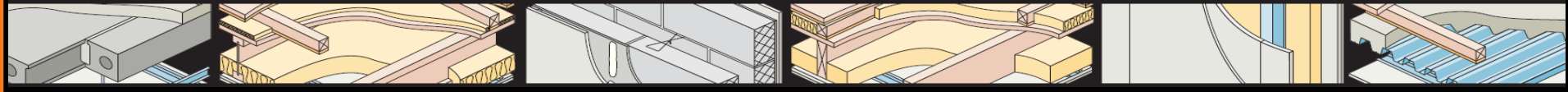


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OUT



So what is SAP?



- Domestic ‘incarnation’ of the National Calculation Methodology
- There are several flavours of SAP e.g. RDSAP, new build
- For new build it shows compliance to Part L1A
- Six approved software providers
- It is completely transparent – no black box
- But a lot is in the box...



In the transparent box



- Not just the 200+ pages of the specification
- BR443 – how to calculate U-values
- BR497 – how to calculate thermal bridging (psi values)
- Product data and CE marking
- Links to references e.g. for boilers, CIBSE
- Numerous references to ISO, EN and BS standards



The SAP doesn't work myth

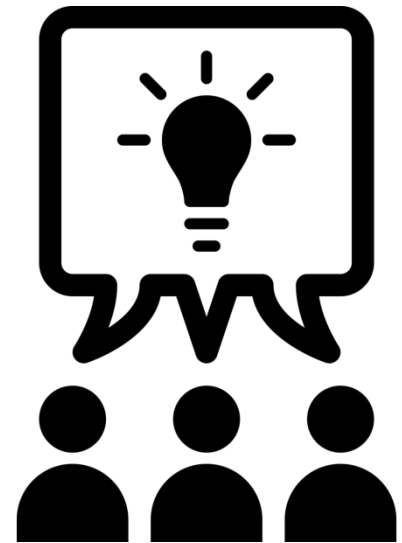


- A classic case of blaming the messenger
- SAP is not designed as a 100% accurate model of reality
- It is a compliance tool based on a notional building
- Is your building better or worse than that
- 26% average DER error from data input identified in the ZCH report (pages 68 and 69 final report)
- When the SAP engine (BREDEM) compared to PHPP pretty good correlation observed

Dealing with innovation



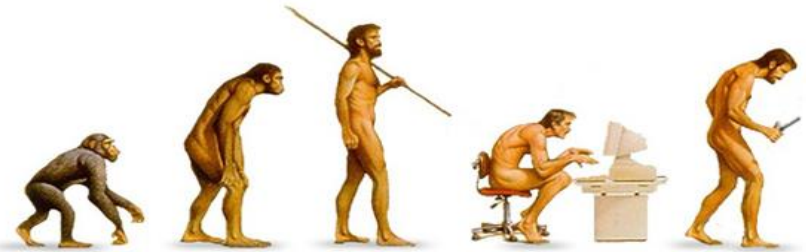
- Two main issues
 - Modelling the individual innovation e.g. a product
 - Modelling how the product affects the whole home
- Temporary solution via Appendix Q
- Longer term via integration into SAP itself
- New areas such as overheating
- Issues identified by ZCH work
- Digital construction e.g. BIM



So how does SAP need to evolve



- Several technical areas need to be addressed
 - Overheating
 - Design versus as-built report
 - High rise
 - Newer technologies
- Integration with BIM
- Better data validation
- Ability to be used as design tool



But....



- Government has insufficient resources
- NCM and SAP cannot be privatised
- Process of changing SAP specification is often opaque, slow and late
- Six different software implementations
- There is little openly available data on what technical solutions are chosen by the industry



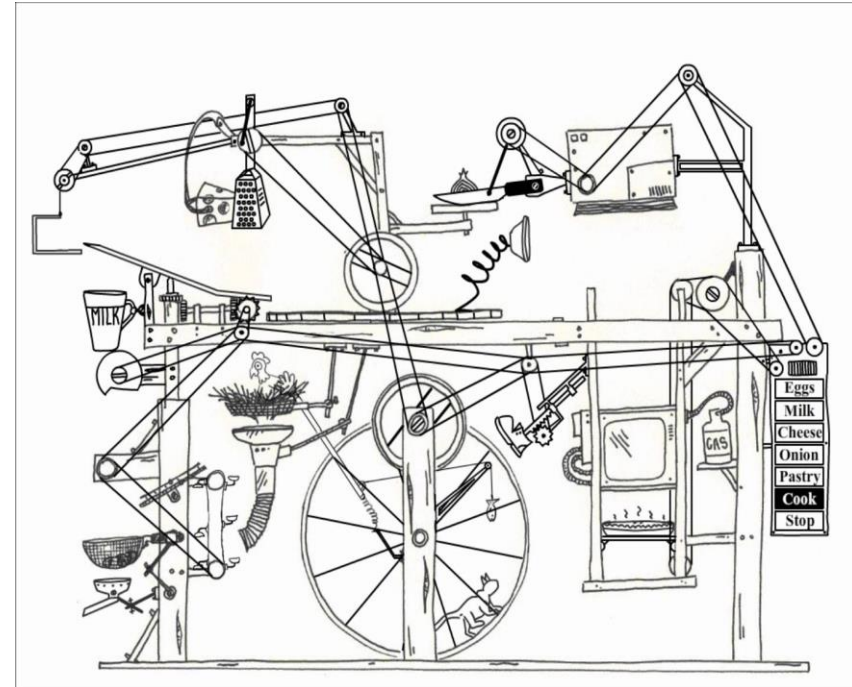
So....what if....



- Industry offered to fund and develop new build SAP
- Under a new governance structure
- Collaborative development of a single SAP engine
- Make the engine free and open source
- Software providers can then build interfaces and extra features on that
- Allows a better design tool interface to be developed
- At 'as-designed' and 'as-built' stages, data uploaded to a SAP web portal
- A fee taken and SAP certificates issued

Advantages

- Absolute consistency on SAP results as same engine
- Could optimise structure of engine to allow new technologies to be easily added
- Software providers could focus on true added value features



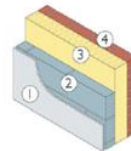
Advantages

- Web based system could check individual plot data against the average to help validate
- Data on all SAP inputs and outputs could be published periodically in an anonymised form to help inform industry and supply chain
- Users pay

U-Values: walls

Wall type 1: full fill masonry

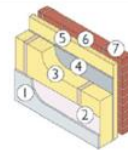
1. Plasterboard
2. 100 mm blockwork
3. Mineral wool insulation ($\lambda=0.037$ W/mK)
4. 100 mm brickwork



U-value	Aircrete blockwork ($\lambda=0.15$ W/mK)		Dense blockwork ($\lambda=1.33$ W/mK)	
	Insulation thickness	Wall thickness	Insulation thickness	Wall thickness
0.25 W/m ² K	110 mm	340 mm	135 mm	365 mm
0.23 W/m ² K	125 mm	355 mm	150 mm	380 mm
0.20 W/m ² K	150 mm	380 mm	175 mm	405 mm
0.15 W/m ² K	220 mm	450 mm	240 mm	470 mm

Wall type 3: timber frame mineral wool

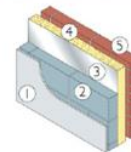
1. Plasterboard
2. Vapour control layer
3. Mineral wool insulation between studs ($\lambda=0.037$ W/mK)
4. Sheathing board
5. Mineral wool insulation over studs ($\lambda=0.037$ W/mK)
6. 50 mm clear cavity
7. 100 mm brickwork



U-value	Insulation thickness		
	In cavity	Between studs	Wall thickness
0.25 W/m ² K	15 mm	140 mm	360 mm
0.23 W/m ² K	25 mm	140 mm	370 mm
0.20 W/m ² K	50 mm	140 mm	395 mm
0.15 W/m ² K	110 mm	140 mm	455 mm

Wall type 2: partial fill masonry

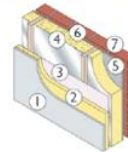
1. Plasterboard
2. 100 mm blockwork
3. Rigid PIR insulation ($\lambda=0.022$ W/mK)
4. 50 mm clear cavity
5. 100 mm brickwork



U-value	Aircrete blockwork ($\lambda=0.15$ W/mK)		Dense blockwork ($\lambda=1.33$ W/mK)	
	Insulation thickness	Wall thickness	Insulation thickness	Wall thickness
0.25 W/m ² K	55 mm	335 mm	70 mm	350 mm
0.23 W/m ² K	65 mm	345 mm	75 mm	355 mm
0.20 W/m ² K	80 mm	360 mm	90 mm	370 mm
0.15 W/m ² K	115 mm	395 mm	130 mm	410 mm

Wall type 4: timber frame rigid PIR

1. Plasterboard
2. Rigid PIR insulation over studs ($\lambda=0.022$ W/mK)
3. Vapour control layer
4. Rigid PIR insulation between studs ($\lambda=0.022$ W/mK)
5. Sheathing board
6. 50 mm clear cavity
7. 100 mm brickwork



U-value	Insulation thickness		
	Over studs	Between studs	Wall thickness
0.25 W/m ² K	0 mm	80 mm	340 mm
0.23 W/m ² K	0 mm	100 mm	340 mm
0.20 W/m ² K	0 mm	125 mm	340 mm
0.15 W/m ² K	30 mm	125 mm	370 mm

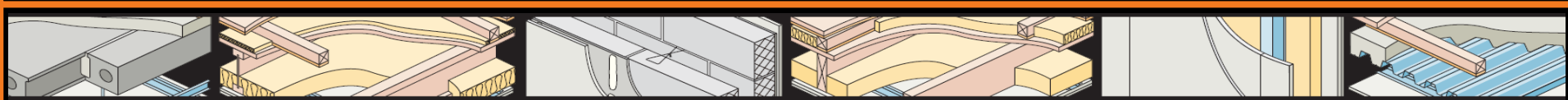
Some more heresy



- Why use SAP at all?
- Scotland has simplified buildings
 - Full fabric and services specification
 - Build at least as good as these and no SAP calculations
 - Still need EPC at end
- We have Model Designs (but dormant at present)
- For the SME builder, how about an English simplified building via Model Designs?
- Job done?



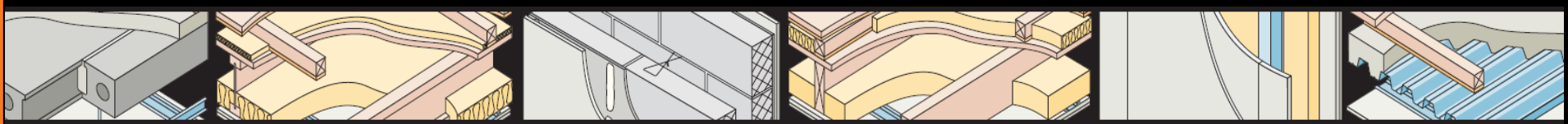
Last thoughts



Summary

- SAP is critical to your business
- It needs updating
- Government has no money
- The industry does
- There is a pause in Part L
- So why don't we make the offer
- *After all, what could possibly go wrong?*





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