

# TECHNICAL BULLETIN

FOR RESIDENTIAL SURVEYORS AND HOUSING PROFESSIONALS

## RISKS ASSOCIATED WITH RIVERS AND WATERCOURSES



RISKS TO BUILDINGS AND OCCUPANTS  
ASSOCIATED WITH RIVERS AND  
WATERCOURSES

FUEL FOR THOUGHT

CYBERSECURITY

MIXED-TENURE DEVELOPMENTS



# THE TECHNICAL BULLETIN

FOR RESIDENTIAL SURVEYORS AND HOUSING PROFESSIONALS

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Welcome to the Technical Bulletin. This Technical Bulletin is designed for professionals working across all housing sectors.

Produced by Sava, you will find technical articles, regulation updates and interpretation, and best practice. We hope you find this useful in your day-to-day work and we welcome any feedback you may have and suggestions for future publications.

## Who we are

We are a team of building physicists and engineers, statisticians, software developers, residential surveyors, gas engineers and business management specialists.

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# RISKS TO BUILDINGS AND OCCUPANTS ASSOCIATED WITH RIVERS AND WATERCOURSES

## ARE WE TAKING THE RISK OF FLOODING SERIOUSLY ENOUGH?

HILARY GRAYSON BSC EST MAN (HONS), DIRECTOR, SAVA

Proximity to rivers and watercourses can pose certain risks to buildings, particularly in times of heavy rain. These risks can be further exacerbated when considering the implications of hidden or redirected water courses which only take water in extreme conditions. This article explores some of those potential risks and asks if surveyors should advise clients differently in times of more extreme weather events brought on by climate change.

Buildings located near rivers or watercourses may be vulnerable to flooding during periods of heavy rainfall or when rivers overflow their banks. River flooding (also known as fluvial flooding) occurs when a watercourse cannot cope with the water draining into it from the surrounding land.

Climate change has made devastating flood events more likely. The UK's first Climate Change Risk Assessment (CCRA), published in 2012, reported that the risk is likely to increase with more water in rivers following extreme weather events and the predicted rise in sea level.

In January 2024, the University of Southampton announced they had been awarded a £6.5million fund to launch a new flood research and training centre. The [news article](#) describes how "Currently one in six households in the UK are located in flood-prone areas", and states the biggest drivers of flooding are increased river flow, surface runoff, storm surges and waves which are compounded by climate change and shifting populations. The new hub will allow scientists to improve their understanding of flooding using advanced monitoring and new forms of computer modelling, artificial intelligence, and machine learning to map and forecast future flooding risks.

### **If a property is flooded from a river, what are the issues that may occur?**

Flooding from a river can be simply a 'gentle' overflow onto adjacent land, but often river flood events are accompanied by an increase in the flow of water which can cause extensive damage to structures – think bridges being washed away – and lead to loss of life. If a river can wash a bridge away, it also has the

potential to cause extreme damage to foundations, walls, and floors. If it does not actually damage the structure itself, the force of flowing water can lead to erosion around a building's foundation, which will compromise its stability.



Figure 1: Visible damage to footpath adjacent to the River Great Ouse following flooding event.

As well as damage to buildings, there is also 'damage' to occupants. River floodwaters can be contaminated with sewage, chemicals, and other hazardous substances, posing a potential health risk to occupants and potentially causing additional damage to building materials and electrical systems. Luckily, as far as human health is concerned, river flooding in the UK is not usually associated with 'major health events' such as cholera outbreaks.

Such severe health risks are usually most associated when a flooding event results in a mass migration of people. In 2006, the World Health Organisation (WHO) published a Flooding and Communicable Disease fact sheet which reported that risks associated with waterborne diseases related to flooding are low unless there is a significant displacement of the population, or the original water sources are compromised by the flooding.

That said, the consequences should not be ignored. Harmful pathogens might be very rare in UK flooding events, but at the very least basic levels of hygiene will need to be improved and areas avoided until the flood material has been cleaned up.

However, human health is not just impacted by waterborne pathogens. There are other health implications such as:

- Injury from floating or concealed debris
- Drowning
- Mental health issues
- Injury from electrical incidents (electrocution or fire)
- Carbon monoxide poisoning from an inappropriate use of generators.

One final health implication to consider for both the occupants and the property is the exacerbated risk of mould growth. If flood water is not promptly and properly cleaned up, it can lead to prolonged moisture exposure to the fabric of the building. This is likely to provide the correct environment for mould growth within the building materials

and mould, albeit different species, can be damaging for buildings and people.

### Water and electricity

When water gets into electrical systems it can be extremely dangerous and for the following reasons.

**Electrical Conductivity:** Water is a very good conductor of electricity which means that an electric current can flow through it. If water comes into contact with live electricity, it can potentially lead to electric shock or electrocution.

**Short Circuits:** If water comes into contact with electrical wires or connections, it can cause a short circuit where the electricity bypasses its intended path and flows directly from the positive side to the negative side of a power source. This can lead to overheating, fires, and damage to electrical equipment.

**Damage to electrical equipment:** As well as the risk of short circuits, when water gets inside electrical equipment it can corrode metal parts, which in turn will disrupt circuits, and render the equipment non-functional and potentially dangerous.

**Fire Hazard:** If water contacts electrical outlets or switches, it can increase the risk of fire. It can do this because it reduces the resistance in electrical circuits causing overheating and sparking. This can ignite flammable materials nearby.

Flooding can be dangerous and damaging to electrical systems and appliances, so it is essential to turn off the electricity supply during a flooding event to prevent electrical accidents.

### The hidden costs of flooding

What can easily be forgotten is the longer-term impact of flooding on the mental health and wellbeing of those affected, which can be severe. In July 2022, the UK government published a summary of health implications relating to flooding. It reported that the English National Cohort Study of Flooding and Health found that people who had experienced flooding were more likely to have symptoms of post-traumatic stress disorder (PTSD), depression, and anxiety between six months to three years following the event. It also found that the extent of the impact on mental health was affected by the levels of the floodwater and how long the floodwater stayed in the home.

### The visible cost of flooding

Flooding can cause extensive damage to properties which can be extremely costly and time-consuming for property owners and insurers to repair. However, it is not just the damage that is expensive. It has been estimated that the flooding in 2015/16 cost the economy £1.6 billion. The economic losses from flooding between November 2019 and March 2020 are, in turn, estimated to be about £333 million. These costs have been derived from the analysis of the impact of flooding on properties and businesses (source <https://www.gov.uk/government/news/counting-the-costs-of-flooding>).

Properties located in flood-prone areas may face higher insurance premiums or even difficulty obtaining insurance



protection in the first place. Understanding flood risk and taking appropriate measures to mitigate it can help manage insurance costs. However, where a location is particularly at risk of flooding, insurance can be expensive or even, in some cases, unobtainable. This is where the Flood Re Scheme comes in.

The Flood Re Scheme is a joint initiative between the UK insurance industry and the UK government. It was established by the Water Act 2014 and its purpose is to improve the affordability and availability of flood insurance for residential properties at high risk of flooding.

### Hidden water courses

The problem with hidden water courses is in the name – they are hidden or ‘lost’ and that means their potential for wreaking unsuspected havoc is all the greater.

The Victorian and Edwardian urbanisation of cities and towns often lead to the diversion and culverting of rivers and brooks. Our industrialist forefathers considered waterways an inconvenience unless they were directly used in industrial processes or to remove waste. Hence many were often diverted underground. In some cases, this was essential as rapid population growth without the supporting modern infrastructure meant that open urban waterways often became open sewers.

Probably the most well-documented of the lost rivers are those in London that would have been tributaries of the Thames, with the best known of these being the Fleet. Now completely lost from view, the Fleet is part of London’s sewer network. However, London is not the only city to have ‘lost rivers’.

Manchester’s River Medlock was channelled into brick culverts and built over but has now been partially restored as part of the development of the new Mayfield Park. While this project was driven by public amenity and environmental objectives, releasing the river from its straitjacket will, according to engineers, help manage flood risk in the city centre.

### The importance of desktop research

There may be a variety of reasons for considering a particular property; for purchase by your own organisation if you are a housing provider; on behalf of a private purchaser if you are a surveyor offering buyers surveys; or on behalf of an investor. Whatever the reason, the key to assessing the risk of flooding is through diligent desktop research.

The government has a website where you can explore the risks of a particular site: <https://flood-map-for-planning.service.gov.uk/>. With a postcode or grid reference, you can assess the risk of a property being subjected to flooding based on a location’s chance of flooding from rivers or the sea in any year. The risk profiles do not consider other sources of flooding or future risks, so just because a property is in Zone 1 – the lowest risk – doesn’t mean it can’t still flood in the future.

There is also an additional site which includes more detailed information at a granular property level: <https://www.gov.uk/check-long-term-flood-risk>. This gives a wider risk profile from a variety of water sources.

It must be remembered, however, that these flood risk maps show just that, **risk**, and cannot be relied upon. For example, Totnes is interesting in this respect because the Environment Agency flood mapping shows that much of the downtown area is at high risk, but this does not take into account the fact that the Environment Agency has installed flood defences that have largely been successful at keeping river water at bay in recent years. That said, these defences have not been entirely successful and have been breached (slightly) several times.

The Environment Agency mapping is not an absolute guide as to what will happen, but it should not be ignored.

The other place to check is old maps, which provide a useful insight into previous uses of the land and can illustrate if local water courses have ‘disappeared’. If, when looking at old maps, there is a suggestion that a stream has ‘gone’, it is a fair assumption to make that it will have been rerouted or potentially sent underground.

It is possible that there could be a conflict between the information on the government risk map and old maps – you know there is a hidden river, but the risk map does not indicate a risk of flooding.

This is a tricky situation, and no one has a crystal ball. This is where local knowledge is essential – knowing that a carpark is liable to flooding in heavy rain, for example, could indicate a possible problem that the Environment Agency has not picked up. One surveyor contacted as part of our research commented that while they use the Environment Agency/Government flood maps, they also supplement these with local knowledge. For example, flood defences were built in this surveyor’s town a few years ago and they comment specifically where a property is in an area where the defences have been less effective.

### Has the risk of flooding increased?

The Royal Meteorological Society (rMetS) published a ‘Graphical Abstract’ in July 2023, which provides a summary of the UK’s weather and climate for 2022. It presents this together with the historical context for a number of essential climate variables.

rMetS produces annual ‘State of the UK Climate’ publications which provide an accessible, authoritative, and up-to-date assessment of UK climate trends, variations and extremes based on the most up-to-date observational datasets of climate quality.

We remember July 2022 for the record breaking temperatures, but when considering rainfall, the headlines for 2022 were that in that year rainfall was 94% of the 1991–2020 average, which included the UK’s eighth wettest February on record (although it should be noted that January, March, April, July and August were all notably dry, particularly across England and Wales, and that in fact the UK had its driest summer since 1995).

The report noted that five of the 10 wettest years for the UK in a series from 1836 have occurred in the 21st century and that since 2009, the UK has experienced its wettest February, April, June, November and December on record in

monthly series from 1836 – 5 of 12 months – as well as its two wettest winters.

It also reports that the most recent decade (2013–2022) UK winters have been 10% wetter than 1991–2020 and 25% wetter than 1961–1990, with much smaller changes for spring, summer and autumn overall and there has been a slight increase in heavy rainfall across the UK in recent decades.

But dig a bit deeper and you can find that the winter of 2013/14 was the wettest since records began in 1910 and of the top ten wettest winters, four have occurred since 2007 and seven since 1990.

December 2015 was the wettest December on record and the wettest calendar month overall since records began in 1910. And this year, according to provisional Met Office statistics, Northern Ireland had its wettest July on record (in a series which dates from 1836).

And of course, there are the winter storms we now experience. The rainfall from Storm Desmond in 2015 broke records when Honister in Cumbria, received 341mm (13.4 in) within 24 hours, breaking the previous November 2009 record of 316.4mm.

Overall, RMetS concludes that the UK’s climate continues to change. The recent decades have been warmer, wetter, and sunnier than the 20th century and there has been a slight increase in heavy rainfall across the UK. Also, following Storm Desmond, a report submitted to IOPscience, an online service for journal content published by IOP Publishing, concluded that climate change increases the probability of heavy rains in Northern England/Southern Scotland like those of Storm Desmond.

**How should surveyors assess and report the risks to ensure they are not liable?**

If the risks are changing, then should the way we behave also change? This statement would be correct for other areas so is surely true for researching, inspecting, and reporting on enhanced risks to property from extreme weather events triggered by climate change.

We asked a few surveyors about the way they have adapted their professional service because of such risks. The general responses were that:

- They do have a different approach to desktop research than that of, say, 10 years ago
- While the Government/Environment Agency’s flood risk maps are good, local knowledge is essential because you can interpret the local geology and history
- All the surveyors questioned said that it is essential that they are aware of hidden water courses in their localities and the potential risks they may pose, and report those risks to clients
- All the surveyors questioned said that it is essential to ensure they advise clients on how important it is to have the correct buildings and contents insurance.

Fundamentally, the view was that **it is** the surveyors’ job to have a crystal ball and that ignoring river flood risk associated with climate change is not an option.



**Hilary Grayson BSc EST MAN (Hons) is the Director of Surveying Services at Sava**

Hilary’s focus is on developing new qualifications and Sava’s activities within residential surveying. Hilary has a wealth of experience within the built environment, including commercial property, local government and working at the RICS.



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# FUEL FOR THOUGHT

## CAN HYDROGEN HELP THE UK TO DECARBONISE DOMESTIC SPACE HEATING?

**JOHNNIE LEATHER**, PUBLIC POLICY RESEARCHER, MA SOCIAL AND PUBLIC POLICY, SAVA  
**DR NEIL CUTLAND**, MINSTP, CONSULTANCY DIRECTOR, SAVA

Hydrogen is the most abundant element in our atmosphere, but can we harness its energy potential to heat our homes? At present, electric heat pumps are the government's preferred low-carbon heating solution. In addition to this, there is ongoing research and testing to determine the role that hydrogen could play. With no carbon dioxide emissions at the point of end use, a case is being made to replace the natural gas burnt in our boilers with hydrogen.

However – is the transition to hydrogen really that straightforward? Is hydrogen a better alternative to heat pumps? Or is it all hot air?

In accordance with the UK's 2050 Net Zero target, the space heating of homes – which accounts for around 14% of annual emissions – will have to be decarbonised. To address this challenge, the upcoming 2025 Future Homes Standard is set to outlaw fossil fuel boilers in new dwellings, while a further ban on fossil fuel boiler sales is expected by 2035. With 83% of homes in the UK warmed by fossil fuel boilers, it is clear we are entering a heating revolution.

### **The hydrogen rainbow**

Unlike the gas currently burned in domestic boilers, pure

naturally occurring hydrogen gas, known as 'white' hydrogen, is hard to locate and extract. Therefore, the viability of using hydrogen to heat homes is heavily contingent on the availability of produced low-carbon hydrogen.

According to the International Energy Agency (IEA), in 2022 global hydrogen production relied heavily on the use of fossil fuels. Natural gas without carbon capture and storage (CCUS), resulting in 'grey' hydrogen, accounted for 62% of production. While 'brown' hydrogen from coal



made up 21% and oil 0.5%. Following from this, by-product hydrogen, produced at refineries and in the petrochemical industry, amassed 16%.

Finally, the low-carbon options, and therefore the only ones being considered for space heating decarbonisation, represented the smallest share of production. Fossil fuels with CCUS made up 0.6% and electricity 0.1%. The hydrogen produced using these energy sources are also known as ‘blue’ and ‘green’ hydrogen respectively and will be referred to as so in this article.

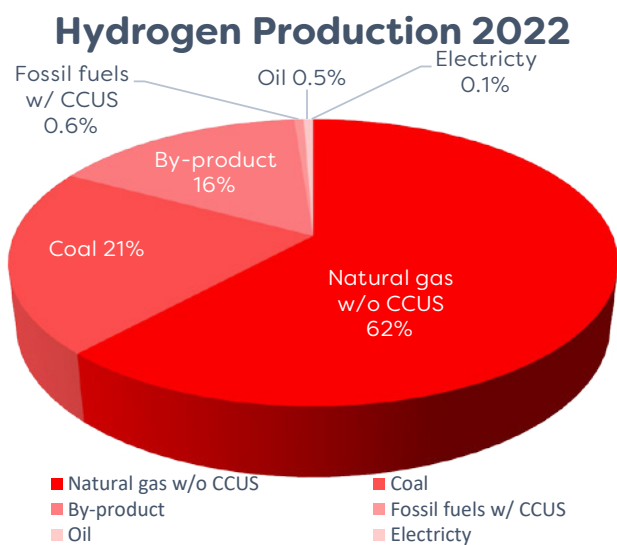


Figure 1: 2022 global hydrogen production by technology. Data sourced from IEA Global Hydrogen Review 2023

### Hydrogen boilers

When it comes to burning hydrogen for heat in our homes, this can be done in boilers like those used for natural gas. Hydrogen boilers come in two main types, the first being ‘hydrogen-blend ready’ boilers. These are the same as regular natural gas boilers, and through some minor changes, can burn a gas blend of up to 20% hydrogen.

Despite marketing by some boiler companies, ‘hydrogen-blend ready’ boilers are not a recent invention, with boilers being required to operate this way since the mid-1990s.

The second type is ‘hydrogen-ready’ boilers. Again, these can also burn natural gas, but by changing a couple of components can operate on a 100% hydrogen gas supply. Though not available yet, ‘hydrogen-ready’ boilers are in development, with industry estimating that they will be available from anywhere between 2023-2028.

In terms of cost, the available ‘hydrogen-blend ready’ boilers are no more expensive than natural gas boilers. Equally, the UK’s big four boiler manufacturers (Worcester Bosch, Vaillant, Baxi, and Ideal) have promised that ‘hydrogen-ready’ boilers will cost no more than their natural gas equivalents.

### The gas grid and the transition to hydrogen

To transport hydrogen to our homes, the proposal is to use the existing gas grid. Although no official decisions have been made on how/if this will happen, the most plausible transition would happen in the following stages.

The first stage would be to deliver a blend of hydrogen and natural gas. National Grid, who own the pipelines, have plans to introduce anywhere between 2% and 5% hydrogen to the UK’s gas blend by 2025.

Following this, the hydrogen content would progressively be increased until it accounts for 20% of the gas mix; estimated to happen by 2028 at the earliest.

The final stage of the transition would be for the gas supply to be completely hydrogen. However – complications arise when the level of hydrogen in the gas blend rises above 20%. If the gas supply were to surpass 20% hydrogen, the metal pipes, valves, and pumps in the grid would be damaged, meaning they would all have to be replaced with ones made of alternative materials. Also, all boilers would have to be ‘hydrogen-ready’ not just ‘hydrogen-blend ready’.

Estimates place the earliest possible completion date for such tasks to be mid-2040s, so we are a long way off knowing the details of how such a change would happen, but both would undoubtedly be arduous and expensive. It must be noted, that until 2026, the government are refraining from making a ‘strategic decision’ on the exact role that hydrogen will play in decarbonising homes. This means that prior to this decision, any comments on how and when hydrogen will be used to heat homes are speculative.

### The government’s stance

As mentioned, ultimately the government is still undecided on the exact role of hydrogen in decarbonising UK homes and meeting net zero targets. However, as we draw closer to the 2026 decision, it seems increasingly likely that hydrogen will only be used to meet a small amount of heating demand.

In their 2021 report, UK Hydrogen Strategy, the government explored the potential role of hydrogen in achieving net zero. The paper recognised low-carbon hydrogen as an option for decarbonising heating in buildings, with the possibility for it to be a like-for-like alternative for properties using natural gas. The report also expressed that the feasibility of such is contingent on further research.

Currently, a range of projects are underway with industry, regulators, and other stakeholders to determine the cost, feasibility, and safety issues of using hydrogen for heating homes. Amongst these are plans to trial a pilot hydrogen town. Whitby was proposed as a pilot hydrogen town, but after a backlash from the town residents who were concerned about the cost and safety of hydrogen, the trial was scrapped. Redcar was also being considered for a pilot ‘hydrogen village’ but was again scrapped after there was inadequate access to locally produced green hydrogen.

### The arguments in favour

Those in support of hydrogen heating are mainly gas distribution networks, boiler manufacturers, and energy suppliers. In the UK, these three sectors have joined forces under the guise of 'Hello Hydrogen', to raise households' awareness of hydrogen's role in reducing emissions.

One argument for hydrogen as a decarbonisation solution hinges on the similarities between existing heating systems and those required for hydrogen. The argument goes that because of these similarities, in most cases, the physical changes to a property that are required to install a heat pump and the corresponding heating systems are greater than that for hydrogen.

The most compelling support for hydrogen heating is the advantage the supply chain would have over heat pumps. With an already well-established boiler supply chain, comprised of many manufacturers and gas engineers, this system could more easily be adapted to hydrogen.

The heat pump supply chain, on the other hand, is in its infancy and has proven to be a limiting factor in the uptake of heat pumps. Nesta estimates that there are around only 3,000 heat pump engineers in the UK, this is far off the minimum 27,000 required by 2028 to meet targets, and the 120,000+ gas engineers certified through the Gas Safe Register.

### The arguments against

Despite the arguments in favour of hydrogen heating, it is not without opposition. Jan Rosenow's, *Is heating homes with hydrogen all but a pipe dream? An evidence review*, provides perhaps the best singular documentation of the arguments against hydrogen heating.

In the paper, Jan Rosenow, Director of European Programmes at the Regulatory Assistance Project, and Honorary Research Associate at the University of Oxford, reviews the evidence presented by independent studies on hydrogen heating. Rosenow's overwhelming conclusion is that hydrogen is more expensive and less green than heat pumps.

The main reason for the heightened cost and emissions of hydrogen is the production process. The bottom line is, producing hydrogen is energy intensive, meaning the costs are high and the associated emissions are contingent on the energy source or the use of CCUS.

Even in an ideal world with cheap, abundant renewable electricity it is simply more efficient to use the electricity to directly warm homes via heat pumps than to produce 'green' hydrogen for use in boilers. This means, it will always be cheaper and more environmentally friendly to opt for heat pumps.

To be specific, a study by the Hydrogen Science Coalition stated that to deliver an equal amount of heat to buildings, heat pumps require up to six times less electricity than hydrogen-fuelled boilers.

Furthermore, the other low-carbon option, 'blue' hydrogen,

would cause the UK to remain exposed to and reliant on the volatile international gas market.

If this were not compelling enough to refute hydrogen heating, then consider the cost and complexity of building a gas system that can run on 100% hydrogen. A task that would require replacing thousands of pipes, pumps, and valves meters underground or even having to build an entirely new gas system.

The impartial National Infrastructure Commission (NIC) recently found in their five-yearly report that the cost of producing hydrogen is forecast to outweigh the greater in-building cost of heat pumps. The NIC estimated that in 25 years the price of integrating hydrogen heating in the UK's energy system would be 18% higher than a mostly electric pathway.

### Other uses for hydrogen

As explained, hydrogen is not cheap, easy, or green (most of the time) to produce. This means that there is a robust argument for reserving what low-carbon hydrogen we can produce for hard-to-decarbonise sectors, where green alternatives are limited. The most suitable sectors are transport, specifically shipping, and energy-intensive industry processes like steel and glass production. Using hydrogen in steel production would be an especially good use of hydrogen because steel is the predominant material used in wind turbines.

Another potential use for hydrogen is energy storage. Electricity is converted into hydrogen via electrolysis, and this hydrogen can then be stored and converted back into electricity using turbines when required.

Although hydrogen energy storage has a low round-trip efficiency (40-60%), it has the benefit of being one of the highest capacity and longest duration storage options. This unique offering makes it apt to store large amounts of excess renewable energy that can be kept over whole seasons. The demand for storage of this kind will only increase as renewables share of the generation mix grows.

### The realistic role hydrogen will play in heating

It is likely that over the coming years, hydrogen will begin to be used to help meet a small amount of the UK's space heating demand. However, it is unlikely that hydrogen will contribute much further than this, with none other than BP - an oil and gas 'supermajor' - stating in their 2023 Energy Outlook that there is only a limited role for hydrogen in heating buildings.

Government targets reinforce this, with a goal to develop 5GW of low-carbon hydrogen production capacity by 2030, enough to heat 5.5% of UK homes. Given there is no guarantee that this generation target will be met and there are other competing demands for hydrogen, it is evident hydrogen could only meet a fraction of the UK's heating demand.

One option is to use hydrogen to 'top up' domestic heating systems, where the main heat source is a heat pump and the secondary a hydrogen-fuelled boiler. The Climate Change



Committee suggest this is a good option for buildings where full electrification is not feasible and to help meet peak demand on cold winter days.

**Concluding thoughts**

Although it is always worth exploring and researching emerging technologies, this should not draw away from investment in already proven ones. With it becoming increasingly apparent that hydrogen heating only has a small role to play in decarbonising space heating, it is important we pursue the already proven solution: heat pumps.



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Johnnie has an MA in Social and Public Policy and carries out research on energy policy and sustainability in the built environment.



**Dr Neil Cutland, Minstp, Consultancy Director, Sava**

Dr Neil Cutland, who joined Sava in 2022 as Consultancy Director, has spent his whole career as an energy and sustainability consultant. He specialises in low-energy housing in particular. Neil has held Directorships at sustainable built environment consultancy Inbuilt, BRE's Low Carbon Housing Futures Centre, TEAM Energy and previously at Sava during the 1990s (when our name was National Energy Services). Neil also set up his own company, Cutland Consulting Ltd, in 2010, where his clients included the energy regulator Ofgem, the NHBC Foundation, Hastoe Housing, Knauf Insulation, BEIS, DLUHC and many others. Neil is one of the authors of the BREDEM-8 and BREDEM-12 models and has contributed extensively to the development of the SAP since its inception.

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# CYBERSECURITY

## REDUCING RISK IN A BUSINESS AND KEEPING SYSTEMS SECURE

**MATT NALLY, CEO, SURVEY BOOKER**

Whether you are a sole trader or a large enterprise, it's beneficial to make your systems more secure than the average firm so that malicious actors move onto lower-hanging fruit. Drawing from his firsthand experience in implementing cybersecurity measures within his own business, Matt Nally, CEO of Survey Booker, offers invaluable insights to help you achieve quick wins in enhancing your cybersecurity.

Cybersecurity is an easy topic to ignore. Most think “it won't happen to me” or “I'm just a sole trader”, but even if you're small, you're not unknown. From our [podcast on cybersecurity](#), you'll know that robotic scanners quickly pick up on everything online and you'll be somewhere in a hacking funnel.

If you aren't implementing some basic security practices, you risk being the low-hanging fruit for the sake of a few minutes' effort. It's surprisingly easy to be more secure than the average when so many ignore easy solutions to protect themselves. If you're thinking of moving on to another article, you're either following the steps below or the low-hanging fruit.

### **What are the key risks to your business?**

There are two key risks to your business: people and systems.

### **Protecting your systems**

In today's interconnected world, the risk of cyber threats poses a significant challenge for businesses, regardless of their scale. From data breaches to ransomware attacks, the potential consequences of inadequate cybersecurity can be detrimental to a company's reputation, financial stability, and overall operations. To protect your business from these risks, it is crucial to implement robust cybersecurity practices.

That doesn't mean going back to pen and paper, storing paper files and sending letters by carrier pigeon! Hard copy records have their own risks of being lost, damaged or destroyed. We simply need to look at how you can protect yourself.

For optimal benefits to your business, consider which systems you use that would have the greatest impact on your day-



to-day operations and reputation if they went down. For example, if someone was able to hack into your emails, they could:

- send emails pretending to be you
- make payment requests to customers that appear legitimate
- reset passwords for your other systems and gain access

Hence, prioritising maximum security measures for your email system is paramount. Your CRM would be the same as it's central to running your business efficiently. Whereas software for designing marketing imagery or logos may be less of a concern.

So, how can you protect your online systems easily?

### Implement a strong password policy

Strong passwords are key as your first step of defence. The golden rules:

- Use a secure password containing letters, numbers, and special characters.
- Don't share passwords—each user must have their own login.
- Don't reuse passwords—if one password is in a data breach, all your systems are at risk
- Don't use similar passwords—one small tweak is easy to brute-force attack (where hackers try lots of similar variations automatically)
- Don't force periodic password resets. This might seem counterintuitive, but the National Cyber Security Centre's advice is not to regularly force password changes. You are more likely to set a weaker password, so you remember what it was changed to. You should change passwords if you think it has been breached.

**\*Quick tip:**

Passwords in the green would be hard to remember and type in each time! Implement a password manager such as LastPass or 1Password. These often have a free tier for individuals. These will generate complex passwords, store them securely and prefill them into login pages so you don't need to remember them!

Does it make that much difference? Here is a graph of how quickly different passwords can be guessed in a brute-force attack (guessed at speed by a computer). Your password complexity takes you from an easy instant hack to virtually impossible.

Lost your device? You can login on another device to your password manager to revoke access to the lost device.

### Implement Multi-Factor Authentication (MFA)

It might take 7qd years to brute-force your password. However, passwords alone are no longer sufficient to protect your business from unauthorised access. If someone can guess it or find it in breached data, they are straight into your account and off they go.

Implementing multi-factor authentication (MFA) adds an extra layer of security by requiring you or your team to provide additional authentication, such as a fingerprint, a unique code, or a token, in addition to the password. That way, after your password is entered, you still have one step to go.

MFA significantly reduces the risk of your account becoming compromised even if passwords are stolen or cracked. Survey Booker helps protect you by requiring a minimum complexity of password and offers the option of 2FA and Single Sign On.

### Practice regular software updates and patch management

Yes, we've all heard it before. And yes, we all like to keep pressing 'snooze' or 'try again tomorrow' on that update button because we're in the middle of something. However, outdated software often contains known vulnerabilities that cybercriminals can exploit.

To minimise this risk, establish a regular update and patch management process. Keep your operating systems and applications up to date with the latest security patches provided by vendors. Enable automatic updates wherever possible, and regularly check for updates

Number of Characters	Number Only	Lowercase Letters	Upper and Lowercase Letters	Numbers, Upper and Lowercase Letters	Numbers, Upper and Lowercase Letters, Symbols
4	Instantly	Instantly	Instantly	Instantly	Instantly
5	Instantly	Instantly	Instantly	Instantly	Instantly
6	Instantly	Instantly	Instantly	1 sec	5 secs
7	Instantly	Instantly	25 secs	1 min	6 mins
8	Instantly	5 secs	22 mins	1 hours	8 hours
9	Instantly	2 mins	19 hours	3 days	3 weeks
10	Instantly	58 mins	1 months	7 months	5 years
11	2 secs	1 day	5 years	41 years	400 years
12	25 secs	3 weeks	300 years	2k years	34k years
13	4 mins	1 year	16k years	100k years	2m years
14	41 mins	51 years	800k years	9m years	200m years
15	6 hours	1k years	43m years	600m years	15bn years
16	2 days	34k years	2bn years	37bn years	1tn years
17	4 weeks	800k years	100bn years	2tn years	93tn years
18	9 months	23m years	6tn years	100tn years	7qd years

Reference: [www.hivesystems.io/blog/are-your-passwords-in-the-green](http://www.hivesystems.io/blog/are-your-passwords-in-the-green)  
MDS hashed passwords cracked by an RTX 2080 GPU

manually if automatic updates are not available.

### Regularly back up and protect data

Data loss can be devastating for a business, revealing what you are doing, when and who for. If your data is subject to a ransomware attack or simply all gets deleted, backups ensure that you can easily restore and restart. Of course, that's only helpful if you back up your data frequently, otherwise, you'll still be missing a lot of information.

Again, it's easily ignored but a nightmare when you need to recover your information and you've neglected it. Days and weeks go by very quickly without you realising you've not made any manual backups!

Emails and file storage can easily be set to automatically backup using different systems online, so you don't have to remember to do it yourself. Systems like Survey Booker also regularly back up data for you.

### Use a VPN when using public Wi-Fi

As a surveyor frequently on the move, utilising a VPN (Virtual Private Network) is essential when accessing public Wi-Fi networks. While you're likely to stop at places like coffee shops, the majority of public Wi-Fi hotspots are vulnerable to security breaches. This exposes you and your data to potential risks, as malicious entities can easily intercept your device's activities on these networks.

A VPN enables you to encrypt traffic to and from your device and reduce the risk of a malicious actor monitoring what you are doing. This means you can still use public networks but without taking as much of a risk.

### Choose your suppliers wisely

Your suppliers not only deliver services to you but also handle your sensitive data. Hence, the security credentials of your suppliers carry significant weight, indicating their commitment to safeguarding your data. Engaging external auditors to assess their practices underscores their dedication to maintaining robust security measures. Suppliers lacking accreditations may overlook vulnerabilities in their systems or processes, potentially exposing your data to risks.

What should you look for? An internationally recognised accreditation is ISO 27001. It's a rigorous process that looks at all aspects of a business's security, from software to people.

Why does this matter? Cyber security is one of the hottest topics at the moment. If a key supplier to your business cannot operate due to a cyber-attack, you can't either, so you want to know they're doing everything they can to keep you running smoothly.

External certifications help you ensure suppliers are meeting specific standards as they undergo audits by accredited third parties. This means you can choose suppliers with your due diligence done for you. For this reason, Survey Booker maintains ISO 27001 certification and undergoes multiple audits each year.

### People

While you may have fortified your systems, the most significant risk to their integrity remains you and your team.

After all, we're all susceptible to human error. Instances such as falling prey to phishing scams, taking shortcuts, or setting weak passwords for convenience are common pitfalls. So, how can you ensure the security of both yourself and your team?

### Educate and train employees on cybersecurity best practices

Provide regular and comprehensive cybersecurity training programs that encompass a wide range of topics, from best practices to recognising common threats and effectively responding to security incidents. Ensure the training is interactive and engaging, using real-life examples and case studies to reinforce the importance of security practices. This makes it easier to spot a suspicious-looking email or form. Additionally, always provide explanations for the rationale behind security measures, as understanding the "why" is pivotal in fostering behavioural change.

### Clear Security Policies and Guidelines

Develop clear and concise security policies and guidelines that outline expectations and responsibilities for employees regarding information security. This should cover everything from password policies, clear desk policies and leaving devices unattended.

### Phishing simulations and testing

Phishing is when 'attackers attempt to trick users into doing 'the wrong thing', such as clicking a bad link that will download malware or direct them to a dodgy website' (National Cyber Security Centre).

How do you test if your team can spot a malicious email or text? Regularly conduct phishing simulations and testing exercises to assess employees' susceptibility. These are where employees see an email and fall victim to not realising that it is a malicious email designed to harvest credentials. These simulated attacks can help identify areas where additional training or awareness is needed so they don't fall victim to a real one.

### Restrict what your team has access to

Team members should only have access to data they require. Regularly review and update access permissions, particularly during role changes or when employees leave the organisation. This proactive approach serves to prevent an employee from maliciously making changes or deleting data as many attacks can start from within. Moreover, it safeguards your business in the event of compromised accounts, as hackers face limitations in making system changes with reduced access levels.

### Mobile device management

It happens more often than we'd like to admit - people misplace or lose their devices all the time. Whether you've accidentally left your tablet on the roof of your car, or your phone has fallen out of your pocket on a train, these incidents are commonplace. A mobile device manager allows you to connect your company devices to the device manager and you can remotely lock or wipe a lost device so that any data contained on it can't be accessed by a third party. The risk of losing a device is also why you should store all your data on the cloud and not on the device itself!



**Conclusion**

Protecting your business from cyber threats requires some planning. While it may be tempting to overlook this aspect and hope for the best, implementing quick and effective measures now can significantly bolster your security. Investing just a couple of hours now could potentially save you hours of headache in the event of a data breach.

What are the easy wins you can implement after reading this article:

- Implement a password manager and strong password policy
- Implement multi-factor authentication
- Check if the certifications of suppliers you are using and consider moving to accredited suppliers

**Want to learn more about mitigating business risks?**

Check out our [podcast](#) where we have episodes with cybersecurity specialists, ISO 27001 auditors and more. They share their insights on how you can best protect your business and help keep yourself safe and secure.

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# MIXED-TENURE DEVELOPMENTS

## A BUILDING BLOCK FOR LASTING COMMUNITIES

**JOHNNIE LEATHER**, PUBLIC POLICY RESEARCHER, MA SOCIAL AND PUBLIC POLICY, SAVA

England is grappling with a severe housing crisis, a cause of high costs and low supply. The problem is particularly acute in London and cities in the Southeast of England where property prices are highest and land most scarce. Given the pressing need for more homes, the delivery of well-thought-out developments is of vital importance for executing a sustainable solution.

Mixed-tenure developments are, as the name suggests, residential developments where different tenure types are found on the same site. Often recognised for creating thriving communities of varied socioeconomic groups, mixed tenure has a key role in combating the housing crisis, especially in urban spaces. But why is this so?

Typically, tenure could be split into two broad categories in England; owner occupied and social. Since the 1990s, the private rented sector has steadily increased, giving rise to a third category. Now, according to 2021 Census data, in England 61.4% of properties are owner occupied, 20.4% privately rented and 17.1% social.

To avoid confusion in this article; owner occupied, social and private rented will be the three encompassing tenure types that make up mixed tenure. Furthermore, owner occupied will include outright ownership and dwellings

with a mortgage, while the social sector will cover both social and affordable properties.

### **Integrated, segmented and segregated communities**

Tenures can be mixed to varying degrees, described as either 'integrated', 'segmented' or 'segregated'.

- 'Integrated' tenure is where properties of different tenure types are side-by-side, and the tenure type is not visually distinguishable from the style of building. This is



what true mixed tenure is normally taken to mean.

- ‘Segmented’ tenure is a less closely mixed classification, where different types are split, perhaps into separate blocks and/or hold different visual characteristics.
- ‘Segregated’ tenure is where different tenures are kept geographically apart, such developments can also be referred to as mono tenure.

### The history of building mixed tenure

Mixed tenure is far from a new concept, having formed a prevalent part of the post WWII New Towns movement. The movement, which Milton Keynes, Sava’s home, is a leading example of, sought to regenerate the country after the destruction of the World Wars.

However, it was not always the favoured method for planning new developments. Notably, during the 1950s and 60s – the period of the highest rates of property building in England – segregated developments were the norm, consisting of solely owner occupied or social tenancies.

Since then, building mono-tenure has become entrenched with criticisms of creating ‘ghettos’ and concentrated areas of deprivation. Mono-social developments are thought to hinder social mobility and fuel stigmatisation towards social housing. House building from the period has become typified for failing to create desirable communities, serving as a warning of what happens when buildings targets are prioritised over thoughtful placemaking.

Moving to present day and precautions are in place to limit mono-tenure developments. The current National Planning Policy Framework in England requires at least 10% of the total number of homes at major residential developments to be affordable. This means that all new developments are, to some degree, mixed tenure.

### Shared Ownership

Under the Coalition Government, there was a drive to increase shared ownership, leading to the sector experiencing growth since 2010. Shared ownership is an initiative that allows people to acquire a share of a property opposed to the whole thing, thereby making it a more affordable route into owning property.

A buyer will normally purchase 25% of the property’s full market value but it can vary between 10% to 75%. Deposits are then typically 5% or 10% of the share and the remainder of the share is met through monthly rent payments. It is also possible to purchase a greater share of the property over time in chunks, a process known as staircasing.

At the time of writing, to qualify for shared ownership, the household income must be below £80,000 or £90,000 in London. Additionally, they tend to require the purchaser to have a connection to the area, such as living or working there.

Between 2015 and 2021, 76,500 new shared ownership properties were delivered. Although only 1% of properties in England were shared ownership

in 2021, the Affordable Homes Programme plans to deliver 180,000 more by 2026, with £11.5 billion of grant funding available. Given these building targets and the current mortgage rates, shared ownership could well be a vital initiative to prop up affordable homeownership over the coming years.

### The Private Rented Sector

In countries, notably Germany and the United States, financial institutions such as pension funds and insurance companies have been much more involved in residential investment where private rented residential property accounts for a much larger part of the overall residential stock (Germany 60% and US 32%).

In contrast the private rented sector in the UK is much more fragmented. Although, since January 1990, the percentage of UK housing stock in the private rented sector has grown from 9% to 20%, this is mostly due to the growth in the residential buy to let sector.

According to the ‘Private Landlords Survey 2010’, 89% of landlords were private individual landlords responsible for 71% of all private rented dwellings, with a further 5% of landlords being company landlords responsible for 15% of dwellings. More than three quarters (78%) of all landlords only owned a single dwelling for rent, with only 8% of landlords stating they were full time landlords.

However, the Buy to Let market peaked in 2017 following the introduction of tax changes for private landlords. As long ago as 2018 this policy generated concerns about the reduction in the private rented sector, with ‘Buy Association’ warning that the policy could leave “the country with a major issue”. The RICS warned the government that as smaller landlords were “pushed out of the market due to the removal of mortgage interest tax relief, combined with stricter lending criteria and a higher stamp duty burden, the increasing demand for rental property could see rents pushed up by 15% over the next five years.”

Since 2010, financial institutions have taken a more serious interest in the private rented sector, in part encouraged by their positive experiences in the private student accommodation market. This is usually through ‘Build to Rent’ developments.

Build-to-rent refers to homes that are purpose-built for rent, rather than for sale. According to the Build to Rent Hub (<https://buildtorent.info/data/>) build-to-rent is fast becoming an established sector in the UK housing market to meet demand for high-quality, professionally-managed rental housing – both for urban living (typically as apartments) and suburban (as single-family homes).

According to the Hub, in the last quarter of 2022, there

were 242,548 build-to-rent homes in the UK, including both London and the regions, of which:

- 78,717 are complete
- 72,244 under construction
- 113,379 in planning, 91,272 units in London and outside there are 151,276 units.

**The social impact of mixed tenure**

A driving factor in building mixed tenure is the associated social benefits. Mixing tenure is a key tool for creating socially and economically varied areas, which is favourable for establishing desirable communities and avoiding problems linked to exclusively low-income areas.

The social impact of mixed tenure is something that the Joseph Rowntree Foundation (JRF) has widely researched into. They found that a good mix of incomes results in better wealth distribution within the community. Further to this, different tenure and property types allow households to remain in neighbourhoods as their circumstances change, creating greater stability.

**Impact on property value**

Equally significant, a literature review, carried out by the National House Building Council (NHBC) Foundation and the Housing and Communities Agency, found that mixed tenure did not have a negative impact on property values.

The report stated that, in fact, the integrated approach was thought to be most popular with developers for maintaining property value, suggesting concerns that mixed-tenure developments could negatively impact private sector house prices are misplaced. While another study by the JRF verified that an impact on property value can be eliminated by ensuring that the quality of other aspects (such as the design and quality of the houses) can offset any anxieties that may arise.

That said, it should be noted that lenders are usually very cautious around new property developments (whether mixed tenure or not) simply because they have to manage their exposure to risk. Depending on the risk profile of the lender and a range of factors such as general location and untested areas etc. some lenders may only lend on up to 10% of a new development so as not to be overexposed on a site that is ‘untested’ in the market.

**Comment from Anne Hinds, BSc (Hons) FRICS (Lead Practitioner Surveying & Verification, Sava)**

From a valuation point of view surveyors/valuers need to make sure they understand the tenure mix and the relationship of the various types of tenure to the property they are valuing and the impact that may have on the value. They need to ensure that comparables are chosen carefully and that they reflect the same attributes as the property they are valuing.

**What does good mixed tenure look like?**

This being said, not all mixed-tenure developments are

created equal, and it is simply not enough to combine tenure types to achieve the associated benefits. Instead, the extent to which the positives are actualised will depend on a development’s general design, including layout, building quality, local amenities, connection to surroundings, access, and care to the way people will live in the homes. The concept of placemaking is essential throughout the design phase.

Additionally, communities should be formed of a variety of dwelling types and sizes that are characteristically indistinguishable. A mix of dwelling types and size is important for driving mixed communities, while characteristic similarity blurs tenure types, reducing stigma towards social housing.

Another aspect to be considered is the continued estate management once built. With the recent growth of the private rental sector, landlords have increasingly been buying up properties to rent out. This changes the tenure dynamic in an area and can impact social and economic mixes too. Therefore, to achieve the benefits of mixed communities, it is important to ensure that there is an element of asset management in the years following delivery. Likewise, any services and facilities should receive long-term management to maintain a high quality.

**Dockley Apartments**

An example of a mixed-tenure development that strived to meet these demands is Dockley Apartments in Bermondsey, Southwark (pictured in this article). The 111-unit development is comprised of private, shared ownership and social housing tenures (38%), with one, two and three bed options.

Influenced by collective housing in Europe, Dockley Apartments gives priority to communal spaces designed to encourage social connection. Roof terraces, wide galleries and a shared courtyard provide ample space for interaction. While the variety of property types help to establish a stable neighbourhood that caters for different household incomes, sizes and ages. It is plain to see how a development designed in this way, with inclusivity and social interaction at its core, achieves the benefits of mixed tenure.

The project will also create a new pedestrian street to



Figure 1: Dockley Apartments (Source: www.dockley-apartments.co.uk)



connect Spa Road and Dockley Road. There are already traders in the existing railway arches in the area but the development includes new commercial units opposite the existing arches. The intention is to “contribute to the array of artisan producers on-site” and also create a lively street suitable for Saturday market trading which will become a key part of Southwark’s ‘Low Line’ walking routes.

**Commercial property and mixed use**

As mentioned, local amenities are also an important factor delivering sustainable mixed-tenure communities, which Dockley Apartments serves as an example of. Developments that seek to combine residential and commercial spaces are known as mixed use, providing not only somewhere to live but also a place to work and for leisure.

Mixed-use developments have been linked to creating more liveable and sustainable communities. Through the provision of on-site commercial amenities, the need for driving is reduced and walking or public transport is encouraged. This, in turn, can lead to more social interaction and lower environmental impact. The residential properties also serve as a ready-made source of customers to support local businesses.

Mixed-use planning is popular in urban settings where space is scarcer and there is a greater need to get cars off the road and people on their feet. Equally, the provision of commercial space allows the development to adapt and change with the needs of the area, feeding into the need for lasting communities.

Some lenders will also be cautious about the type of mixed use incorporated in the development. For example, a block of flats developed for shared ownership adjacent to a national DIY store where access to the car park was through the car park of the DIY store. The majority of lenders declined as suitable security.

**Concluding thoughts**

In an age where a sense of community is diminishing for many, it is important we are increasingly mindful of how we design developments – creating developments that are not just a place to live but also to interact, come together and belong. With land for new developments becoming increasingly scarce in urban areas, especially London, it is key we maximise the space we do have as we tackle the housing crisis.



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Johnnie has an MA in Social and Public Policy and carries out research on energy policy and sustainability in the built environment.

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