MITSUBISHI ELECTRIC

BRC CLIMATE ACTION ROADMAP

NET ZERO PLAYBOOK:

THE INFORMED TENANT

1. THE NET ZERO CHALLENGE FOR BUILDINGS

CONTEXT

The built environment has an enormous impact on the UK's emissions. The Climate Change Committee 2023 Report to Parliament[1] stated that buildings account for 17% of the UK's greenhouse gas emissions.

These are mainly the result of burning fossil fuels (gas or oil) for heating, and from the use of electricity in buildings, since our grid still relies on gas for generation.

But buildings are not only responsible for emissions produced during their operation. Construction, maintenance and even demolition create carbon emissions too. The equipment used in buildings creates emissions during its manufacture and transport; maintenance teams travelling to site also create emissions.

If we take these into account, the impact of buildings on the environment is even larger. The UK Green Building Council (UKGBC) Whole Life Carbon Roadmap[2] states that 25% of UK emissions are directly attributable to the built environment.

However, while building regulations can impact new building design and operation by setting higher standards on energy performance or embodied carbon, most of our building stock is already built, and will be in place for the next 50 years at least. Retrofitting these buildings is vital if we are to meet Net Zero goals.

In fact, the pace at which we are updating older buildings is lagging behind requirements to cut emissions. A report by the UKGBC[3] estimates that the UK must increase the pace of retrofits to 5% each year, requiring double the levels seen in the past decade.

This means lowering the carbon footprint and reducing energy consumption across all sectors, including retail.

There are further challenges ahead for retail due to some specific characteristics of buildings in the sector. Retail buildings encompass a vast range of types, sizes and functions, which means that concepts such as 'average' performance are not always helpful for tenants or landlords setting targets for improvement. In addition, many retail buildings are older than average in the commercial sector, which can increase the complexity of retrofit projects.

NEED TO KNOW

- Buildings account for 17% of the UK's greenhouse gas emissions.
- Emissions are mainly from burning fossil fuels for heating and electricity use.
- Construction, maintenance, and demolition contribute significantly to carbon emissions (25% from the built environment).
- Retrofitting existing buildings is essential for meeting Net Zero goals.
- Retail property has characteristics which magnifying the challenge of reducing carbon emissions, for example many retail properties tend to be older than commercial buildings in general.
- 'Retail' covers a vast range of building types, sizes and functions, so sector 'average' energy or carbon performance figures are not a helpful concept.

NEED TO DO

- Identify and reduce fossil fuel use in building operations.
- Increase the pace of building retrofits to meet Net Zero targets.
- Incorporate energy efficiency measures and sustainable practices in both new and existing buildings.
- Assess your building's carbon footprint now as this will give you your own benchmark to work from and this will set the starting point for your journey to Net Zero.

QUICK WINS

- Check your organisation's carbon-related goals and consider where improved building operation can support these.
- Align retrofit goals with wider organisational goals (e.g. if your organisation is targeting a 25% reduction by 2030, consider how improved building operation can move the business towards that goal).

COMMERCIAL CASE

- Reducing operational carbon can lower energy costs.
- Retrofitting can enhance building value and meet regulatory requirements.
- Demonstrating a commitment to improve the carbon performance of your building is seen as a positive aspect of your brand and business.

2. TENANTS AND LANDLORDS

CONTEXT

We can see from the challenge ahead that being informed about definitions and goals is a critical step on the road to Net Zero. Retail tenants need to understand the implications of energy and carbon regulations for their own operations.

But being an informed tenant can also make a difference when it comes to working with landlords on devising carbon-and energy-saving strategies for a retail building. Being able to collaborate with landlords can benefit both parties by seeing the value in the long-term approach to Net Zero for building owners, as well as the benefits to tenants such as lower operational carbon.

Having a grasp of the key issues in achieving Net Zero means that retailers will be in a better position to identify areas for refurbishment and retrofit that are feasible, affordable and that optimise impact.

Another good reason for tenants to be informed about their Net Zero retrofit options is so that they can have collaborative discussions with landlords.

While landlords and tenants may have the same goals in terms of reducing building carbon emissions, there may be different priorities at play. However, with the right choice of retrofit approach, these projects can deliver benefits for both.

For example, modern energy efficient cooling systems with lower-GWP refrigerants will reduce tenants' energy bills, cut operational emissions and the landlord will see the carbon footprint of their building reduced.

For informed tenants, who also must be persuasive tenants, there are two very strong reasons that landlords need to consider retrofitting their existing buildings: Regulatory requirements; and safeguarding the long-term value of their property asset.

The landlord/tenant relationship should not be a barrier to creating energy efficient and low carbon buildings.

Many landlords and tenants are already finding their way down the same path to Net Zero. Green leases are becoming standard in the largest retail destinations, for example.

The BRC has also developed the Net Zero Protocol[4] which is designed to help retailers and landlords work together to improve building efficiency and to bring emissions to zero across estates.

There is certainly a growing awareness that cooperation makes the journey to Net Zero easier to achieve, with benefits for both.

This Playbook focuses on HVAC upgrades with a focus on energy and carbon. This is an area where landlord and tenant can benefit in the short-and long-term. Heating, Ventilation and Air Conditioning (HVAC) systems also allow for a varying degree of retrofit to suit your goals, store size and type as well as budgets.

NEED TO KNOW:

- Collaboration between tenants and landlords is critical for achieving Net Zero goals.
- Green leases and shared energy-saving initiatives are becoming more common.
- Informed tenants can negotiate better retrofit options and energy savings with landlords.

NEED TO DO:

- Engage in open discussions with landlords about Net Zero objectives and retrofit opportunities.
- Understand energy and carbon regulations to understand the impact on property values.
- Work together on long-term strategies that benefit both tenants and landlords.

QUICK WINS

- Use the *BRC Retailer/Landlord Net Zero Buildings Protocol* as the basis for discussions with your landlord

COMMERCIAL CASE:

- Informed tenants can reduce operational costs through better energy management.
- Collaborating with landlords can provide benefits for both parties, as well as improved building performance which creates a better indoor environment for staff and customers.
- Long-term partnerships on sustainability can improve the operation of a building so that it benefits tenants (e.g. by reducing energy bills) and landlords (by improving the long-term value of the property).

3. HVAC, NET ZERO AND LONG-TERM VALUE

CONTEXT

HVAC systems significantly impact a building's embodied and operational carbon emissions.

Even in buildings which don't use fossil fuels on site, the use of electricity generated from gas or coal-fired power stations results in operational carbon emissions. The UKGBC's Net Zero Roadmap states that 71% of the UK's built environment emissions are created from the energy used to heat, cool and power buildings.

This point highlights how crucial it is not only to switch from fossil-fuel use but also to do it in an energy efficient way. Swapping gas for electric heating, for example, must be accompanied by consideration of how operational energy use can be reduced as part of that process.

However, HVAC systems also have an impact on embodied carbon. For example, equipment from air handling units to pipework and ventilation ducts are manufactured and transported to site, creating carbon emissions before installation.

Furthermore, HVAC systems are regularly maintained, repaired and replaced. These steps increase embodied carbon.

The specification, design and installation of HVAC systems must therefore take whole life carbon into account, balancing embodied carbon considerations with operational emissions.

The embodied carbon impact of HVAC systems can be more challenging to calculate, since it requires an assessment of carbon emissions produced during material extraction, equipment manufacture, transportation, repair and replacement.

The Chartered Institution of Building Services Engineers (CIBSE) has developed a tool which can be used to calculate embodied carbon in HVAC products (TM65: Embodied carbon in building services a calculation methodology 2021)[5].

CIBSE highlights a key point about the carbon impact of retrofit projects. In new build projects, the embodied carbon of MEP (Mechanical, Electrical, Plumbing) systems could account for between 2% to 27% of embodied carbon, depending on the type of project.

However, this proportion can rise in refurbishment projects, particularly where major building elements such as facades are left intact. In this case, the embodied carbon of MEP systems could be around 75% of the whole project.

Again, this highlights the importance of considering the whole life carbon impact of specified HVAC equipment.

Another aspect of retaining the long-term value of a building from the landlord perspective is the increasingly negative attitude towards 'demolish and rebuild' with local planning groups. Increasingly, refurbishment and reuse are encouraged or even required as a first-choice by local planning laws.

Buildings must therefore last longer, which mean that upgrades and improvements must be regarded as requirements to keep pace with legislative changes over time.

For tenants, retrofitting HVAC systems has many benefits. Perhaps one of the most significant is in energy savings, particularly as energy costs are set to rise over the next decade. Savills Reimagining Retail[6] report points out that a 20% reduction in retail energy use is equivalent to a 5% increase in revenue – a strong argument for energy savings.

NEED TO KNOW:

- HVAC systems contribute significantly to both operational and embodied carbon emissions.
- Refrigerants used in heating and cooling systems also contribute to the embodied carbon of a building
- Lower GWP refrigerants include R32, R513a and R454b
- Energy efficiency in HVAC is vital, rather than simply switching away from fossil fuels.
- Selecting the right HVAC system can significantly reduce a building's carbon footprint, improve energy efficiency and enhance the indoor environment.

NEED TO DO:

- Assess current HVAC systems for energy efficiency and potential carbon reduction.
- Explore options for retrofitting HVAC with energy-efficient and lower-GWP refrigerant systems.
- Take into account all aspects of HVAC system performance: energy use, embodied carbon and operational carbon emissions.
- Plan for regular maintenance and optimisation to sustain energy savings.

QUICK WINS

- Conduct building audits to check what HVAC equipment is on-site. It is possible to work with consultants who can carry out this work.
- Record the age and condition of equipment. This includes speaking with maintenance teams to assess what refrigerants are currently being used within HVAC equipment.

COMMERCIAL CASE:

- Retrofitting HVAC can lower energy bills and reduce operational carbon emissions.
- A 20% reduction in retail energy use is equivalent to a 5% increase in revenue.

4. THE IMPACT OF REGULATIONS

CONTEXT

One of the most important regulations for the property sector in recent years has been the Minimum Energy Efficiency Standards (MEES).

MEES regulation mean that it is illegal to let any commercial property which has an Energy Performance Certificate (EPC) rating of less than a band 'E'. This rule applies to all leases, including ongoing.

There are already signs that the government may raise this minimum in the next few years. In a 2020 consultation[7], the previous government noted that it wanted to raise the minimum commercial EPC to C by 2027, and to B by 2030. There is currently no indication of that change being introduced, however the property sector is already preparing.

For the retail sector, given that many of its buildings were constructed pre-1970s and they are of varying sizes, this uplift in MEES would be a serious challenge.

A report from property consultant Savills (Real estate and the carbon challenge)[8] notes that UK government proposals to lift a minimum EPC requirement to B mean that 83% of UK retail stock will have to be improved.

This amounts to 1.4 billion sq feet of retail space, which may be unlettable if that change to MEES comes through. And this is without considering future uplifts to requirements or focusing on carbon emissions rather than energy efficiency.

Savills Reimagining Retail publication adds that: "Where policy is driving change in regards to energy performance certificates (EPC) regulations, this urgently brings into focus the need to improve the energy efficiency of all commercial buildings."

MEES obviously has a direct impact on building owners and landlords. However, if a large proportion of retail space becomes unavailable due to poor energy performance, tenants will inevitably see steeply rising rental costs and greater competition in the market for buildings that meet the standard.

A second area of legislation which is already changing the HVAC sector is the F Gas regulations[9]. These cover the use of fluorinated gases in refrigeration systems – including air conditioning and heat pumps. The types of refrigerants on the UK market are set to change, with the aim of phasing out high GWP refrigerants and boosting the shift to lower-GWP alternatives.

The general impact of refrigerant phase downs is to make them more expensive, adding to the maintenance costs of older air conditioning equipment. Eventually, those systems will become obsolete as refrigerants are phased out entirely – and new lower-GWP refrigerants cannot be 'dropped in' as replacements.

While this change will impact building tenants who pay for air conditioning system maintenance, it should also be a consideration for landlords. Buildings with older air conditioning systems will become more expensive to maintain, with greater a likelihood of expensive breakdowns as they age. Clearly, this will also impact the attractiveness of a retail space to future tenants.

NEED TO KNOW

- Regulations on energy use and carbon emissions in buildings are setting ever-higher targets which impact tenants and landlords alike.
- The long-term value of commercial property is being impacted by Minimum Energy Efficiency Standards (MEES) and is a key driver in retrofits of energy-using systems such as HVAC.
- MEES will also affect tenants because buildings which meet the standard will attract higher rents and there is growing competition for quality retail spaces.
- Tenants should also be aware of changing rules on refrigerants, which will impact maintenance costs of existing HVAC systems. This should be an important factor when thinking about updating these systems.

NEED TO DO

- Check the EPC rating of the buildings you are leasing. This should include the data of the last EPC assessment as well as the ratings.
- Speak with your landlord about ratings which are currently not at the minimum required E – this should be regarded as urgent.
- Work with your HVAC contractor or maintenance company to understand what refrigerants are in use at the properties you occupy. This should be an important element of your HVAC system audit.

QUICK WINS

- EPC certificates should include advice on improving energy efficiency in your building. These could provide a good list of first steps to form your energy efficiency strategy.

COMMERCIAL CASE

- For tenants, the commercial case for occupying a building with a good EPC rating is that it has lower energy bills.
- Understanding the impact of changing refrigerant legislation could save significant maintenance costs in the future. Switching to lower-GWP refrigerants early will be much more cost-effective than waiting until the deadline.

5. PREPARING FOR A HVAC RETROFIT

CONTEXT

Updating HVAC systems in retail buildings can help to achieve significant reductions in energy use and carbon emissions, if planned and executed effectively.

A wide range of energy efficient HVAC options are available on the market today, so there are technologies for different project requirements and building types.

As with all retrofit projects, there are certain considerations to bear in mind for HVAC refurbishment, which will impact system selection and design.

Mitsubishi Electric has been involved in many of these projects, and we recommend careful thought is given to:

* Availability of plant space: Unlike new-build projects, finding the space for replacement plant can be more challenging as it can't be designed in from the start.

* Disruption to building operations: This can vary depending on the work being undertaken. If an entire building can't be shut down for refurbishment, it can be useful to consider a floor-by-floor approach, which in turn may impact the type of equipment selected. For instance, using modular equipment which could see a single module installed to serve a single floor or even part of a floor with additional modules added later to create a larger system.

* Power supply: Electrification of heating and hot water systems requires the assessment and possible upgrade of electrical supply to the building. It may be useful to consider a bivalent solution, for example, which uses electric heat pumps in tandem with gas boilers that are phased out over time.

* Optimising systems: Retrofit projects provide an opportunity to optimise system performance with building controls. This can support long-term energy efficiency while lowering the building's operational carbon footprint.

This could include ensuring that heating and cooling systems default to 'off' when a space is empty (e.g. in meeting rooms). At a more advanced level, controls can be used to monitor domestic hot water (DHW) use in a building and adjust storage volumes automatically to minimise standing heat losses.

HVAC control systems are a readily-available technology that can be applied at any scale, including a room-by-room phased retrofit.

NEED TO KNOW:

- Retrofitting HVAC systems can be complex and requires careful planning.

- Considerations include plant space, power supply, and minimizing disruption during installation.

- Upgrading to efficient systems can provide long-term operational benefits.

NEED TO DO:

- Start discussions with stakeholders early to align on goals and budgets.

- Conduct a thorough assessment of existing systems and building needs.

- Plan for phased implementation to minimize disruption to building operations.

QUICK WINS

- Gather information on current building energy use, including electricity and gas. This will form the baseline for improvements.

Commercial Case:

- Early planning can prevent costly overruns and downtime.

- A well-planned retrofit can enhance building performance and value. Tenants benefit from an enhanced indoor environment which is more pleasant for staff and customers.

- Proactive retrofits can help avoid future regulatory compliance issues, which is good for landlords and tenants alike as they may be unable to continue leasing a building if it does not meet regulations. Retrofits also reduce energy costs.

6. HVAC TECHNOLOGIES IN ACTION

CONTEXT

There is a wide range of HVAC technologies on the market today that are applicable across the different types of retail buildings. Here, we look at some of the key products and techniques that are used in retail buildings today.

Split air conditioning systems with heat pump technology

* Provide heating and cooling independently where needed

* Allows for flexibility of design and layout to suit your requirements

* Indoor units may be added as requirements change

* Reduce energy consumption and enhance carbon efficiency

* A flexible technology, suitable for small or large stores

Hybrid VRF

* Low-GWP refrigerant (R32) system that also uses lower amounts of refrigerant

* Water is the medium by which heating and cooling are carried around a building

* No refrigerant in occupied spaces

* Smaller embodied carbon footprint

* Highly energy efficient, with the option for heat recovery if heating and cooling operations are required at the same time

* Easy to apply in phased retrofit: The small footprint and modular design mean that projects can be managed as phased installations, and it's ideal for retrofits where space may be limited.

Re-use of existing pipework

* Pipework changeover can be a disruptive part of a HVAC retrofit

* It is possible in some projects to re-use existing pipework

* This reduces the cost of the project, as well as the carbon footprint as you are reducing waste

* Makes for a quicker update

* Speak to your installer about this approach to make the most of the technology

Heat pump air curtains

* Open door policy can be important for retailers, but it wastes energy

* Air curtains utilising energy-efficient heat pump technology

* Reduced energy use, lower running costs

* Easy to install and maintain

Lower-GWP refrigeration systems

* Modern refrigeration systems can make the most of lower-GWP refrigerants

* Example: Mitsubishi Electric ECOV

* Units can be connected to multiple refrigerated display cabinets or cold room evaporators - making them a good choice for smaller retailers or convenience stores

* Uses natural CO^2 refrigerant with a GWP of 1

* Operate between -35°C and -5°C so can be used for chilling or freezing

* Units have a heat recovery port so heat recovered from the refrigeration equipment can be used to provide space heating or sanitary hot water.

Building controls

* Enhance long-term energy efficiency allowing monitoring and management of energy use

* Support remote service and maintenance which can identify changes in system performance, and anticipate problems before they create a shut-down

* Keep track of energy use after retrofits to demonstrate savings, calculate EUI and support further building improvements

NEED TO KNOW:

- A wide range of HVAC technologies are available, from split systems to hybrid VRF utilising lower-GWP refrigerants.
- The choice of technology should be based on specific building needs and energy goals.
- Technologies like heat pump air curtains and lower-GWP refrigeration systems offer both operational and environmental benefits.

NEED TO DO:

- Evaluate different HVAC technologies for their suitability to your building.
- Consider the long-term impact of HVAC choices on energy use and carbon emissions.
- Engage with experts to ensure the best system is selected and installed effectively.

QUICK WINS

- Work closely with manufacturers and installers at this stage to clearly explain your goals around energy efficiency and carbon reduction.
- Focus on identifying the right equipment to meet your cooling/heating/hot water requirements within the parameters of your carbon and energy targets.
- Consider time-and cost-saving techniques such as re-using existing pipework wherever possible.
- Controls should be considered a must-have for modern HVAC systems. They enhance the long-term efficiency of your system and allow monitoring and management of energy use.
- Build a schedule of retrofits with your manufacturer, installer and landlord. A phased approach can reduce disruption to the business.

COMMERCIAL CASE:

- Selecting the right HVAC technology can optimise building performance and reduce both capital and ongoing costs.
- Investing in the best technology for your project ensures long-term benefits in terms of energy-and carbon-savings and aligns with Net Zero goals.
- Updating to lower-GWP refrigerant equipment can avoid future added costs and delays to maintenance as higher GWP refrigerants are phased out of the market, making them expensive and difficult to acquire for maintenance.

7. THE RETROFIT REVOLUTION

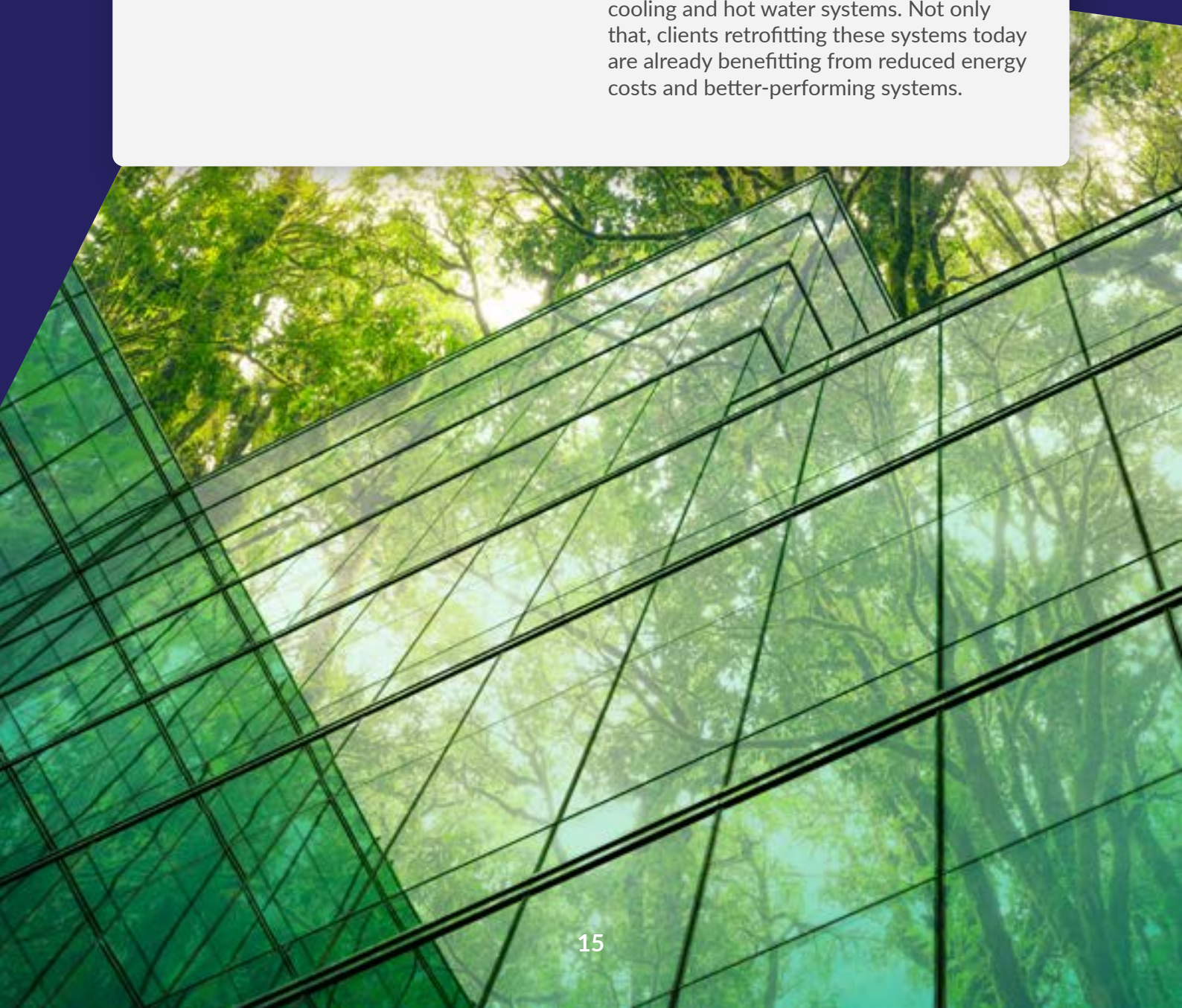
CONTEXT

The retrofit revolution is here to stay and moving faster every year. Retail tenants and landlords who engage with the process of retrofitting for energy efficiency and improved carbon performance will put themselves ahead of the game.

By allowing themselves more time to find the best approach for their building, they will be able to plan their priorities instead of having decisions forced on them by changing legislation or financial obligation.

The time to retrofit is now, not when a building is at imminent risk of becoming a stranded asset. This could impact tenants, leaving them with fewer property options, as well as landlords who may find themselves with a significantly devalued property.

Mitsubishi Electric has worked with clients on HVAC retrofits in the retail sector, which have resulted in lower energy use and reduced carbon footprints for heating, cooling and hot water systems. Not only that, clients retrofitting these systems today are already benefitting from reduced energy costs and better-performing systems.



NEED TO KNOW

- Understand the equipment in your building – an audit is an excellent first step so that you are clear on what HVAC systems you have and what state they are in.
- Have a clear goal for your retrofit project, for example setting a percentage saving for energy or phased targets for carbon reduction. These may already be included in corporate ESG strategies.

NEED TO DO

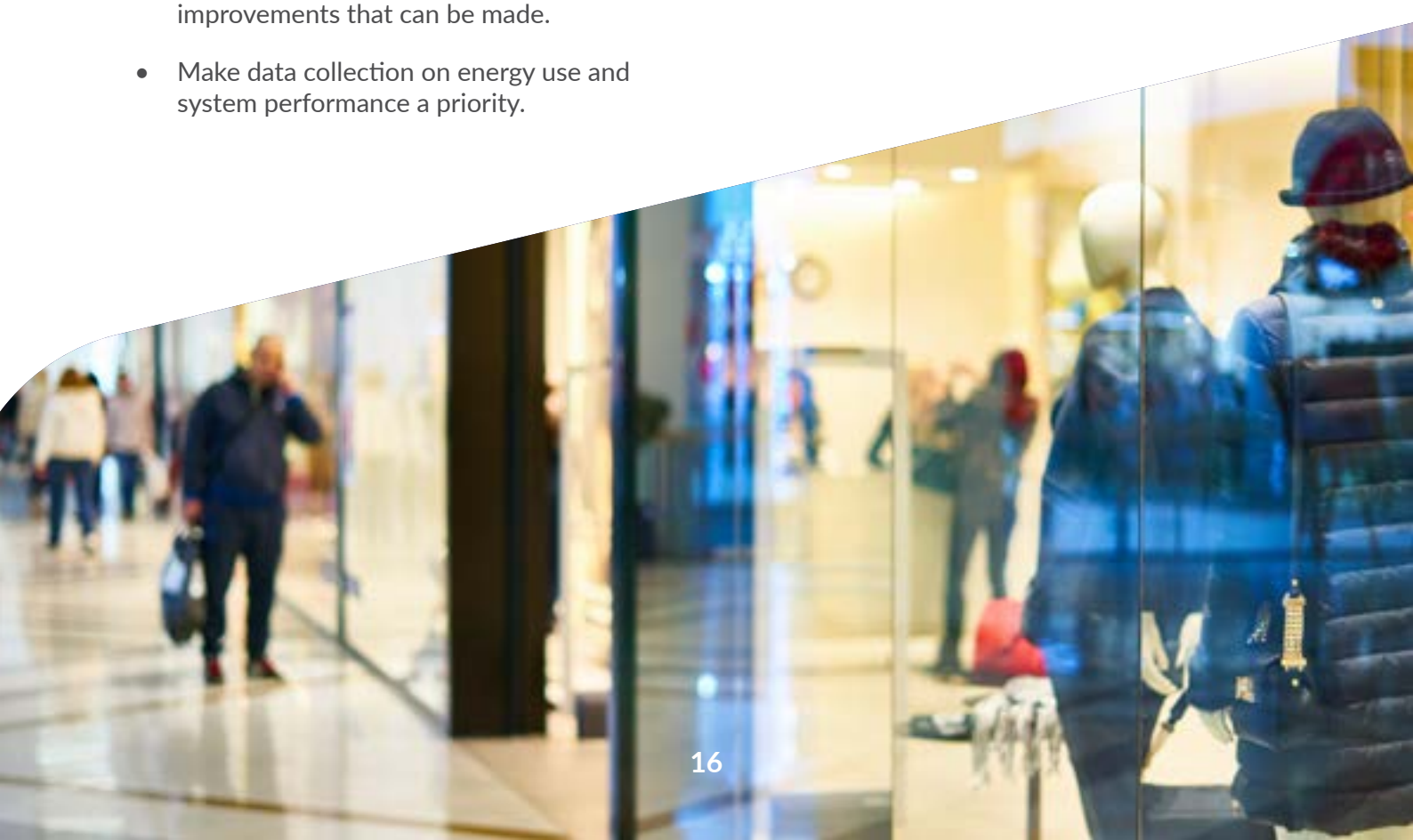
- Gather information on your current energy use. This is vital to have to calculate your current Energy Use Intensity. It will also provide a solid benchmark for improvements.
- Start discussions with your landlord early. The sooner you can agree a pathway to improvements, the better.
- Work with your HVAC manufacturer and installer team to identify the best technology solutions for you. There are many energy-efficient, low carbon HVAC systems on the market today, so no matter what size your store, there are improvements that can be made.
- Make data collection on energy use and system performance a priority.

QUICK WINS

- If you are undertaking any sort of energy efficiency campaign, involving staff will make the process easier and more successful. Explain goals and highlight where changes are being made in-store.

COMMERCIAL CASE

- Modern, energy efficient HVAC systems will reduce operational costs for your retail business by cutting energy use.
- Updating ageing HVAC systems now will save on future maintenance costs, particularly where systems are using refrigerants due to be phased down or out. Prices will rise as this happens, and there could even be shortages, making maintenance expensive if not impossible.
- There is a positive impact for brands that demonstrate and carry through on carbon reduction commitments, with consumers showing a strong preference for brands who are leading the way in this area.



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