

# THE CASE FOR REPLACE

We are all under increased pressure to improve energy efficiency. Replacing old R22 air conditioning systems can make a world of difference.

Designed for those responsible for cooling and heating commercial properties, 'The Case for Replace' is full of key facts and viable solutions to help businesses adopt a sensible approach to the replacement of old air conditioning equipment.

The Case for Replace aims to:

- Clarify the legislation surrounding the use of refrigerants
- Highlight the potential impact this will have
- Explain why 'doing nothing' is not an option
- Propose a range of efficient, cost effective solutions
- Outline key benefits
- Offer a simple, planned approach to replacing old air conditioning systems

If you'd like to take a planned approach and receive on-going information and support from Mitsubishi Electric, please register your interest at:

[www.replace.mitsubishielectric.co.uk](http://www.replace.mitsubishielectric.co.uk)

# The Case for Replace

The Case for Replace highlights the need to upgrade old R22 air conditioning systems.

To assist you in adopting a sensible approach to replacement, this guide focuses on the following issues:

- What is driving the need to replace
- Why doing nothing is not an option
- How to plan ahead to minimise cost and maximise benefits

[www.replace.mitsubishielectric.co.uk](http://www.replace.mitsubishielectric.co.uk)

# The name Mitsubishi Electric is synonymous with excellence



**Founded in 1921, Mitsubishi Electric has evolved and today we offer advanced environmental systems that really can make a world of difference.**

In the UK, the Living Environmental Systems Division provides pioneering solutions that cool, heat, ventilate and control our buildings in some of the most energy efficient ways possible.

Air conditioning can control the internal environment of any building, large or small, to provide cooling and heating from the same system.

Modern air conditioning systems offer more than double the efficiency levels of 10-15 year old systems and can also be far more efficient than traditional methods of cooling and heating buildings, resulting in reduced running costs and lower carbon emissions.

As market leaders, we believe that global climate challenges need local solutions. Our aim is to help individuals and businesses reduce the energy consumption of their buildings and their running costs.

## Notes

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# What's driving the need to replace?



**At the end of 2014 it will be illegal to use R22 refrigerant to service and maintain air conditioning. The continual rise in energy costs also means everyone involved in the built environment is focusing on energy use and consumption.**

The need to reduce CO<sub>2</sub> emissions is further driving the demand for improved energy efficiency in every commercial building, whatever the application.

The UK Government is imposing tough legislation to address these issues and meet challenging energy targets.

To comply, companies are being encouraged to adopt new, low-carbon technologies to improve efficiency.

The key issues that are driving the need to improve energy efficiency include:

- The complete ban of R22 refrigerant for service and maintenance
- Rising fuel costs
- The need to reduce CO<sub>2</sub> emissions
- Increasing legislation
- Corporate Social Responsibility (CSR)
- Uncomfortable environments

## Notes

[illegible]

# Why is R22 refrigerant no longer used?



Hydrochlorofluorocarbon (HCFC) refrigerants have ozone depletion potential which means they can harm the environment if allowed to leak into the atmosphere. Legislation is now in place so that the use of all HCFC refrigerants are phased out by 2015.

If you operate R22 air conditioning this ban affects you as it is now subject to the EC Ozone Regulation No. 1005/2009.

Since January 2010 and as part of this legislation, virgin R22 refrigerant could no longer be used to service or maintain R22 air conditioning systems.

All operators of air conditioning systems that use R22 refrigerant need to be aware that **virgin, recycled and reclaimed R22 will not be available or permitted from 1st January 2015**, which will make it impossible to maintain air conditioning equipment effectively.

There has never been a stronger case for replacing ageing air conditioning systems as there is now.

## Notes

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# A planned approach to the challenge



## **The complete phase out of R22 poses widespread challenges for anyone with old air conditioning systems, for example:**

- In the UK, buildings are being targeted more closely than ever as they use more than half of the energy we produce
- Regulations have been introduced to combat the reduction of CO<sub>2</sub> emissions and eradicate the use of harmful ozone depleting substances (ODS)
- ODS and F-Gas regulations are aimed at reducing the amount of refrigerant leaking into the atmosphere; and reducing the amount of new, potentially damaging refrigerants from entering the market

The drive in legislation is having a major impact on those who design, install and operate air conditioning systems.

Mitsubishi Electric was one of the first manufacturers to develop the technology to enable air conditioning systems to be replaced whilst keeping the existing pipework, wiring and power supply. Today we continue to develop world leading renewable solutions that can reduce both carbon emissions and energy costs.

## Notes

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# Why doing nothing is not an option



**Typically, quality well maintained air conditioning equipment has a life span of around 15 years. This brings all R22 equipment to its end-of-life risk zone before 2015.**

**This time is rapidly approaching and you should start planning now.**

In these challenging financial times, it can seem more cost-effective to try and avoid equipment replacement until it becomes essential.

However, if you do nothing:

- Failure of old equipment could leave you without cooling and heating and lead to unplanned downtime for your business
- Spares of older equipment are likely to be expensive or not available, forcing an unplanned replacement
- You will struggle to find cost effective alternatives to R22 and may have to pay inflated maintenance costs and energy bills
- Recycled / reclaimed R22 is becoming scarce already, and costs are increasing as stock diminishes moving towards the 1st January 2015 ban date

Taking a planned approach to equipment replacement also means that you could consider other ways of increasing the energy efficiency of your building.

## Notes

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# The challenges of ageing air conditioning equipment



**Zero capital outlay sounds appealing, but with ageing equipment, your building is costing more than it should to cool and heat, and producing too much CO<sub>2</sub>.**

As we move towards energy labelling for buildings and tougher legislation, this will be something you have to deal with.

From calculations we estimate that a 15-year-old air conditioning system has typically lost 15% of its capacity and consumes 15% more energy (to provide that reduced capacity) than when new. This leads to an increase in running costs and CO<sub>2</sub> emissions, and as the building's use will have evolved, the system may no longer be able to deliver the capacity required. Air conditioning has advanced significantly over this time and a modern system typically consumes half the amount of energy as a 15-year-old system.

For instance, a typical 10kW air conditioning system installed in an office environment 15 years ago which at a current electricity tariff would have cost £1680\* per year to run when new, would now typically cost £298\* more each year. If this system were replaced with a new efficient R410A air conditioning system, substantial savings could be made so that the system would only cost £1283\* a year to operate, giving a return on investment in just under two and a half years.

\* Source: Mitsubishi Electric Audit Tool, detailed within 'Planned Approach' section.

## Notes

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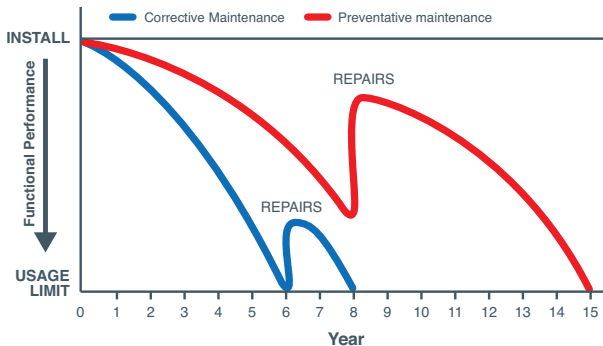
# The challenges of ageing air conditioning equipment



The Case for Replace

**The mechanical nature of air conditioning systems mean that their functional performance deteriorates with age.**

If a system is regularly maintained, ensuring filters and heat exchangers are cleaned, mechanical parts kept running smoothly and control systems optimised, a system can then last in excess of 15 years, albeit at a loss of efficiency from when new. If a system is not maintained and only repaired when required, then the life of the system will typically be less than half of that.



Excerpt from 'Japan Society of Refrigerating and Air-Conditioning Engineers'.

## Notes

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# The available options



Put simply, there are two courses of action open to those operating an ageing R22 air conditioning system.

- **Option One:** Do nothing until the end of 2014 and risk the exposure of site shutdown and/or fines
- **Option Two:** Plan a considered and costed strategy in order to offer a controlled solution and negate the risk

**Option One** has no immediate cost implications but exposes your business to the practical and financial risks of an air conditioning system fault or failure. You will also continue to pay higher running costs on your existing equipment.

**Option Two** will reduce running costs and carbon emissions and the risk of downtime to your business, whilst providing a more controllable, comfortable environment.

## Notes

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# Take a planned approach

Mitsubishi Electric and its installing Partners have a wealth of knowledge and expertise and through this guide we aim to share with you how to plan your replacement effectively.

On the following pages we will cover:

- The importance of the 3 R's - Review, Replace, Recycle
- Assessing the risk to your business
- Planning and budgets, including incentives
- How to prioritise and determine the correct solution
- How to dispose of end-of-life materials responsibly

[www.replace.mitsubishielectric.co.uk](http://www.replace.mitsubishielectric.co.uk)

# The importance of the 3 R's

## - Review, Replace, Recycle



### Review

At Mitsubishi Electric, we understand that timing is everything and it may not be practical or economically feasible to replace an air conditioning system in the short-term. However, it is always worth reviewing your system because even small changes or upgrades can make a significant difference.

Reviewing your building's needs could also highlight areas of wastage such as operating systems full time in unoccupied areas, or to identify where your needs have changed since the system was first installed.

Whatever the results of a review, it will allow you to understand the best time to replace your R22 air conditioning system and plan accordingly. Priorities can be set and budgeted for so that the system can be replaced in financially manageable stages. A thorough review will also highlight which of your equipment may be eligible for Government incentive schemes.



## Notes

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# The importance of the 3 R's

## - Review, Replace, Recycle



### Replace

With R22 air conditioning systems reaching the end of their useful operating life, now is an ideal time to look at the benefits of an advanced, modern air conditioning system.

The vast majority of R22 air conditioning systems are fixed speed which means that they are either 'Off' or 'On' and when they are 'On' they operate at full power. Modern systems are inverter-controlled, so the amount of power they consume is modulated to match demand, making them over 50%\* more efficient than fixed speed.

Modern air conditioning systems and controls not only maximise comfort levels, they also minimise energy use and can help protect buildings from increasingly tough environmental legislation.

### Recycle

Mitsubishi Electric offers an end-of-life recycling service which provides an easy to use, free of charge and certified route for disposal of old equipment, including the refrigerant.

For more information including terms and conditions please visit [www.recycling.mitsubishielectric.co.uk](http://www.recycling.mitsubishielectric.co.uk)

\* Figures are based on nominal conditions taken from the Mitsubishi Electric City Multi Databook 2011.

## Notes

[illegible]

# Review: energy consumption and performance



**Is your existing air conditioning system performing as required?**

**Consider the following:**

- Could it be using more energy than is necessary?
- Are you getting the performance that you require?
- Is it fit for purpose and does it match the current building use?

Since the air conditioning system was installed there may have been many changes in the way the building is used. For instance, changes in office layout, increased headcount and use of heat-generating machinery could significantly alter the cooling and heating requirements.

A Replace System offers flexibility of system design and capacity and could include options such as heat recovery to allow simultaneous cooling and heating, plus an improved controls system such as BEMS.

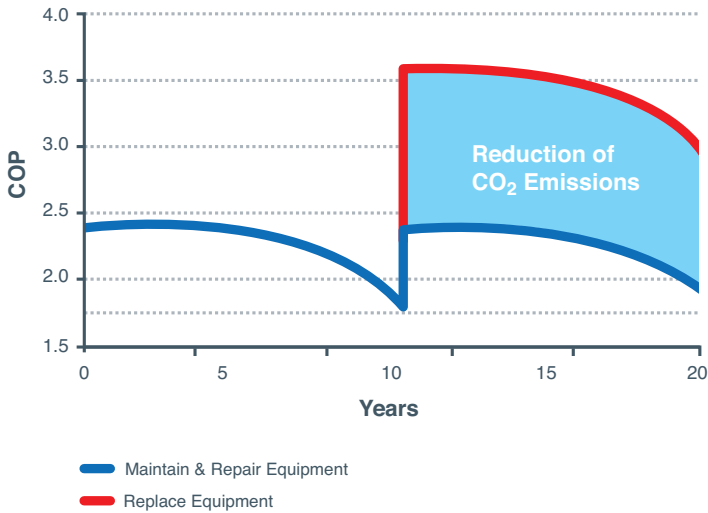
Between now and your planned air conditioning replacement, consider how you can improve the efficiency of your current system - a small change can make a world of difference.

## Notes

[illegible]

# Review: energy consumption and performance

## CO<sub>2</sub> Emissions Can be Reduced by Replacing Old Air Conditioning Units

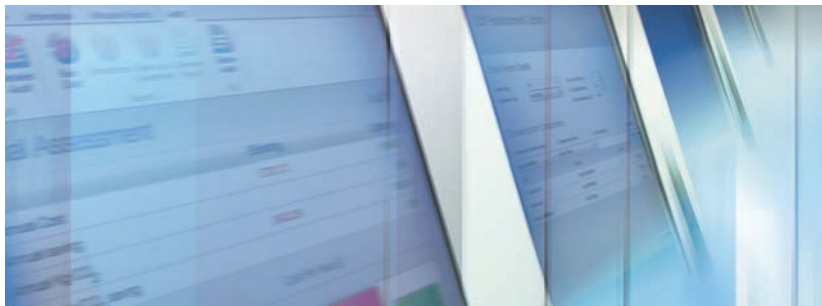


The mechanical nature of air conditioning systems mean that their efficiency deteriorates with age. An air conditioning unit performance is measured in a Coefficient Of Performance (COP), which is a measure of the electrical energy consumed compared to the cooling or heating energy output. The higher the COP, the less electricity an air conditioning system consumes to deliver the same amount of energy. A huge amount of energy and carbon emissions can be saved by replacing your air conditioning system to one with a higher COP.

## Notes

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# Review: by using the Mitsubishi Electric Air Conditioning Audit Tool



## Meet energy issues head on and turn them to your advantage.

Mitsubishi Electric's Air Conditioning Audit Tool is specifically designed software that allows existing and new air conditioning systems to be compared to discover the potential benefits of a replacement or upgrade.



The Air Conditioning Audit Tool looks at the differences in the efficiency of the equipment and calculates running costs, CO<sub>2</sub> emissions, spare parts and labour costs.

The software programme indicates annual running costs and CO<sub>2</sub> emissions for both the existing and proposed new systems to illustrate both short and mid-term return on investment.

The Mitsubishi Electric Air Conditioning Audit Tool provides substantive comparative data to help you decide the right time to change your air conditioning equipment.

If you would like your current air conditioning system to be audited and see how you could benefit, please speak to your installing Partner for an audit demonstration.

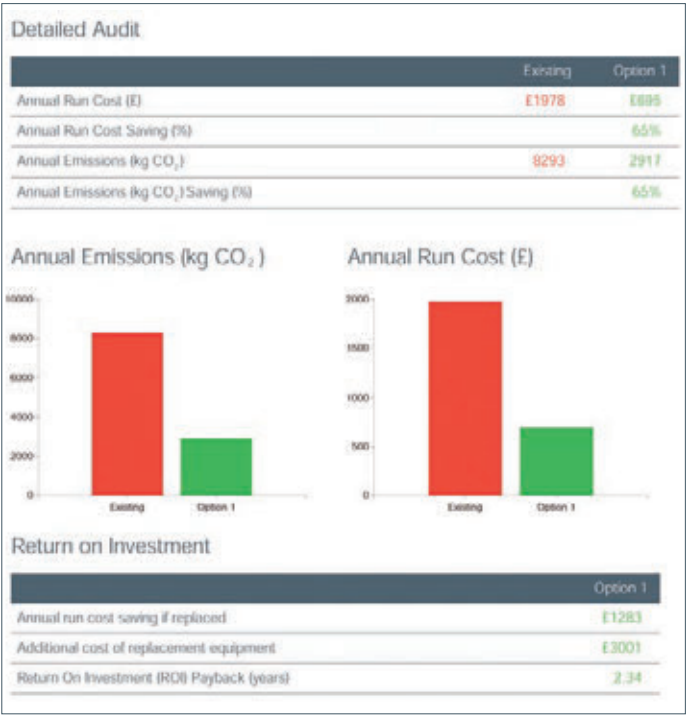


## Notes

[illegible]

# Review: a Mitsubishi Electric Air Conditioning Audit Tool example

It's quick and easy to highlight the potential differences a replacement air conditioning system can bring.



- Office environment
- Replacement running cost P.A. £695
- 10kW Split-System
- Saving 65% annual running costs and CO<sub>2</sub> emissions
- 1997 install
- R.O.I. in just under two and a half years
- Current running cost P.A. £1978

## Notes

[illegible]

# Replace: how to plan ahead effectively



## **Meet energy issues head on by taking a commercially viable, planned approach.**

However you view the issue of replacing R22 air conditioning systems, it is clear that having a plan is pivotal to a successful outcome. Fundamentally there are three choices:

1. Use a drop-in refrigerant in the existing system
2. Replace the entire system and pipework
3. Replace only the indoor and outdoor units and re-use existing pipework, control wiring and power wiring

All three have advantages and disadvantages.

## Notes

[illegible]

# Are drop-in refrigerants the answer?

## ...As a short term measure, potentially



**Drop-in refrigerants are those manufactured to mimic R22, however they do not have any ozone depleting potential, so are legal to use under the EC Ozone Regulations.**

Using such refrigerants may be considered a way of extending the life of an air conditioning system, offering a short term, economically feasible extension of the systems cooling and heating capability within a building.

In our view, these refrigerants come with risks because it is unclear what performance and reliability the air conditioning system will be able to deliver, leading to potential unplanned replacement. Akin to this, availability of R22 spare parts will also diminish over time, making it more costly and difficult to make planned replacements should the systems fail.

We feel that buildings with R22 air conditioning systems should always have a plan to fully replace such systems in a timely manner and if drop-in refrigerants are considered, then this should only be as a temporary solution.

If you would like to assess the cost involved with each option for your building, please speak to your installing Partner for further details.

## Notes

[illegible]

# Is a full-system replacement the answer? ...Yes in some applications



**Replacing the entire air conditioning system, including pipework and wiring is common practice for engineers as it represents a safe choice for manufacturers and contractors and can be easily scheduled and managed.**

Sometimes it is not possible to re-use existing resources and replacing the entire system is the best option. If this path is taken, Mitsubishi Electric has a vast array of solutions for fully replacing an air conditioning system.

All options should be considered before commencing a full air conditioning replacement - changing the entire system could prove more costly, time consuming, and unnecessary in some cases.

Capital outlay will be high as a full air conditioning system replacement requires new pipework and wiring. There will also be the added waste of copper being replaced and the possible costs of re-decoration.

If you would like to assess the cost involved with each option for your building, please speak to your installing Partner for details.



## Notes

[illegible]

# Is a partial-replacement the better option?

## ...Yes



**Because a partial-replacement takes advantage of the infrastructure already in place.**

By using as much material as possible, for instance existing pipework, wiring and power supply, this not only reduces cost (by up to 55%) but also cuts down on installation time and has less impact on the environment.

The most effective solution is to simply replace the indoor and outdoor air conditioning units and switch to an advanced modern R410A system thereby significantly increasing the systems efficiency.

Although the capital outlay of replacing air conditioning equipment will be higher than continuing to run your old R22 units, the new air conditioning system will pay for itself through greatly improved efficiency, performance, reliability, lower running costs, lower maintenance costs and reduced CO<sub>2</sub> emissions.

If you would like to assess the cost involved with each option for your building, please speak to your installing Partner for details.

## Notes

[illegible]

# Recycle: end-of-life



**By utilising as many materials as possible the effect on the environment is minimised, however the old indoor and outdoor air conditioning units must still to be disposed of responsibly.**

Mitsubishi Electric's Green Gateway '360° model' encapsulates the whole lifespan of a product from pre-purchase to end-of-life. As part of this 'cradle to grave strategy', we offer an end-of-life recycling service which gives you an easy to use, free of charge and certified route for disposal of old air conditioning equipment, including the refrigerant.

High levels of raw materials are recoverable with over 90% of them recyclable. None of the systems are sent to landfill, only to Environment Agency approved facilities.

For more information including terms and conditions, please visit [www.recycling.mitsubishielectric.co.uk](http://www.recycling.mitsubishielectric.co.uk)



## Notes

[illegible]

# Legislation and Key Drivers

The Case for Replace aims to provide a comprehensive, but simple guide to the increasingly complex legislation which affects our industry and specifically around replacing cooling and heating systems for commercial buildings. It covers what legislation is already in place, why it exists, the potential impact it may have and how best to negotiate your way through it.

The key factor driving the need for legislation is the European Union's commitment to reach the following targets by 2020, compared with 1990 levels:

- Reduction in primary energy use of 20% by improved energy efficiency
- Cutting greenhouse gas emissions by 20%
- Renewable resources must be used for 20% of all energy consumed

The UK's response to this tough legislation is forcing those responsible for energy use in buildings to review their existing R22 Systems with a planned view to invest in low carbon energy efficient systems.

[www.replace.mitsubishielectric.co.uk](http://www.replace.mitsubishielectric.co.uk)

# The EC Ozone Regulation



**The EC Ozone Regulation (No. 1005/2009) was introduced to control and phase out the remaining uses of all Ozone Depleting Substances (ODS) such as R22 refrigerant. This has led to a total ban on its use for service and maintenance by the start of the year 2015.**

ODS can result in greater UV radiation reaching the earth's surface which is harmful for humans, animals and plants, leading to increases in skin cancer, cataracts and a reduction in food crop yields. Modern alternatives such as HFC's, which include R410A, do not have the same ozone depleting potential (ODP).

- Since 31st December 2009, the use of virgin R22 refrigerant for servicing and maintenance has been banned
- From 31st December 2014, there will be a total ban on all recycled and reclaimed R22 thereby making it impossible to service and maintain air conditioning systems that operate on R22
- Provision should be made to prevent leakages of R22 on currently operational air conditioning systems

## Notes

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# The EC Ozone Regulation



Companies will be breaking the law and will face site shut down and/or fines if R22 regulations are not adhered to.

Therefore, replacing R22 air conditioning systems with modern alternatives (such as R410A) is essential.

Although R410A has zero ODP, it is governed under the F-Gas regulation which calls for action to contain, prevent, and reduce emissions of such gases. Anyone involved with equipment containing F-Gas and/or ODS, will need to ensure that they comply with all necessary legislation.

For most manufacturers, R410A is now the refrigerant of choice and current Mitsubishi Electric air conditioning units have utilised this for over 12 years.

For more information please visit:  
[www.eur-lex.europa.eu](http://www.eur-lex.europa.eu)

## Notes

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# F-Gas Support



**F-Gas Support is a Government funded service, delivered by the Department of Food, Environment and Rural Affairs (DEFRA), which promotes compliance with both F-Gas legislation and regulations governing Ozone Depleting Substances (ODS) such as R22.**

The service offers a variety of information on the issues and is always a reliable, up to date, Government managed service. It provides guidance to manufacturers, operators, contractors and others who make, sell or work with ozone depleting substances, F-Gas or associated equipment.

Anyone involved with equipment containing F-Gas and/or ODS, will need to ensure that they comply with all necessary legislation. As part of Mitsubishi Electric's Partner Programme all of our installing Partners are required to be F-Gas certified.

For more information please visit:  
[www.defra.gov.uk/environment/quality/air/fgas](http://www.defra.gov.uk/environment/quality/air/fgas)

## Notes

[illegible]

# The EU Energy Performance of Buildings Directive (EPBD)



**The EPBD directive is the European Parliament's answer to the demands of the Kyoto Protocol on Climate Change. It has been produced to help reduce energy consumption and eliminate wastage within the built environment.**

In signing the treaty, the EU has agreed to cut greenhouse gas emissions, such as carbon dioxide, to a level 8%\*<sup>1</sup> below those of 1990. The Union must also prove that it has made 'demonstrable progress' towards this goal, meaning that it has to do something quickly, to have the most impact on cutting those emission levels.

In looking for a 'quick win', the EU has found that by increasing its overall energy efficiency, it can make the biggest cuts in greenhouse gases in the least time. Buildings are a particular target because they consume 40%\*<sup>2</sup> of Europe's energy. Replacing old, inefficient R22 equipment can therefore help building operators to comply.

For more information please visit:  
[www.epbd-ca.eu](http://www.epbd-ca.eu)

\*1 Kyoto Protocol

\*2 EPBD website

## Notes

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# Department for Communities and Local Government (DCLG)



The UK's response to EPBD comes through the Department for Communities and the Local Government and focuses on three key areas within EPBD to improve the efficiency of our buildings. Each element will often highlight the need to replace old equipment such as R22 air conditioning systems.

These include:

- Enhancing building regulations
- Introducing certification for buildings
- Requiring inspections of air conditioning systems

In order to conform to strict efficiency requirements within the building regulations, Part L promotes conservation of fuel and power in new and existing buildings. It considers all aspects, firstly reducing the need for energy consumption and then ensuring that the energy is used as efficiently as possible, further promoting renewable technologies.

## Notes

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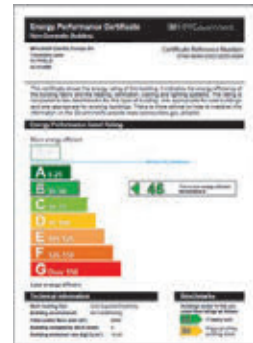
# Department for Communities and Local Government (DCLG)



Energy Performance Certificates (EPC) or Display Energy Certificates (DEC) are required to show the efficiency of a building when sold, built or rented. They promote the improvement of the energy performance of buildings and highlight potential areas for improvement.

In order to make informed decisions about the performance of existing air conditioning plant, buildings with systems greater than 12kW must be regularly inspected by an Accredited Energy Assessor. They will give advice and guidance on how to improve the energy efficiency of the system. The assessors report must be kept on-site and the inspection repeated every 5 years.

For more information please visit:  
[www.communities.gov.uk/planningandbuilding](http://www.communities.gov.uk/planningandbuilding)



Energy Performance Certificate

## Notes

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# The Department of Energy and Climate Change (DECC)



**DECC is responsible for all aspects of UK energy policy, and for tackling global climate change on behalf of the nation.**

The Department aims to drive ambitious changes in the way we use energy, reflecting the fact that climate change and energy policies are inextricably linked.

DECC has introduced the mandatory Carbon Reduction Commitment Energy Efficiency Scheme (CRC EES) to help tackle climate change. Currently under review, it is designed to encourage public and large private sector organisations to improve energy efficiency and cut CO<sub>2</sub> emissions.

Organisations with at least one half hourly meter (settled on the half hourly market) who consumed more than 6,000MWh of electricity during 2008, are required to take part in the CRC EES Scheme.

It is being discussed that participants will have to purchase carbon allowances based on their annual CO<sub>2</sub> emissions.

## Notes

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# The Department of Energy and Climate Change (DECC)



A publicly available Performance League Table (PLT) shows how each participating company is performing in relation to others based on a set of metrics.

The most pro-active companies in terms of energy efficiency and carbon reduction will benefit. Taking a planned approach to replacement of R22 air conditioning systems is a sure way to see a dramatic reduction in energy consumption and carbon emissions. As part of the CRC EES Scheme, such companies who do this will be able to decrease the amount of allowances they need to purchase and will be ranked higher in the league table, saving money and raising their profile as a carbon-saving organisation.

For more information please visit:  
[www.decc.gov.uk](http://www.decc.gov.uk)

## Notes

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# The Carbon Trust



**The Carbon Trust supports businesses keen to save energy and reduce carbon emissions, through the use of energy efficient equipment and low carbon technologies.**

The Trust provides specialist support to help commercialise low carbon technologies. It aims to help businesses develop and implement sustainable strategies to deliver competitive advantage and economic return, using tools such as the Enhanced Capital Allowance (ECA) scheme - a tax relief incentive to help purchase new efficient equipment.

The ECA is a straightforward way for businesses to improve cash flow through accelerated tax relief. The scheme encourages businesses to invest in energy saving plant or machinery specified on the Energy Technology List (ETL) managed by the Carbon Trust on behalf of Government.

Companies can write off 100% of the capital cost of qualifying equipment against taxable profits in the first year of purchase. This provides a welcome cash flow boost and a tax incentive to encourage investment in energy-saving technology.

Mitsubishi Electric has developed a range of highly efficient 'A' rated systems which qualify for ECA and are registered on the Energy Technology List. This makes replacing old R22 systems even more cost effective.

For more information please visit:  
[etl.decc.gov.uk/etl](http://etl.decc.gov.uk/etl)

## Notes

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# Products and Solutions

Mitsubishi Electric is a world-leading pioneer in the cooling, heating, ventilation and controls industry. Investment in product advancement coupled with an on-going commitment to research and development, enable the company to deliver a wide range of products and solutions to exceed today's demands.

This section details:

- The history of R22 air conditioning systems
- Products to meet the demand
- Split-System air conditioning
- Variable Refrigerant Flow (VRF) air conditioning systems
- The importance of Controls

[www.replace.mitsubishielectric.co.uk](http://www.replace.mitsubishielectric.co.uk)

# The history of R22 air conditioning systems



**Production of R22 air conditioning systems started in the mid 1990's and the last Hydrochlorofluorocarbons (HCFC) systems were legally sold until the end of 2003.**

Many manufacturers began phasing out production of R22 air conditioning systems before this date which means that even the youngest R22 system being used today, is at least 9 years old.

By 2015, the performance and reliability of these R22 systems will have decreased, energy consumption will have risen and the risk of complete failure become more likely.

Significant advances in air conditioning systems during the past decade, including inverter-drives and VRF technology, make the comparison in energy efficiency compared to fixed-speed, R22 systems even more striking.

Modern air conditioning systems use R410A, which is a zero ozone depleting refrigerant. It is non-flammable, non-toxic and has very good properties for air conditioning. Compared to R22, R410A offers typically double the efficiency, and will therefore lower running costs and CO<sub>2</sub> emissions by up to 50%\*.

\* Figures are based on nominal conditions taken from the Mitsubishi Electric City Multi Databook 2011.

## Notes

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# The history of R22 air conditioning systems



Through extensive on going research and development, Mitsubishi Electric always aim to deliver the most efficient air conditioning systems possible. R22 was once the most efficient way to cool and heat your building, but naturally technology advances over time to deliver the effective features we enjoy today.

The vast majority of R22 systems are fixed-speed, which means that they are either 'Off' or 'On' and when they are on, they operate at full power. Modern systems are inverter-controlled, so the amount of power they consume is modulated to match demand, making them more efficient than fixed speed.

Improvements in compressor, heat exchanger, fan motors and refrigerant control design enable the indoor and outdoor unit to perform more efficiently and effectively whilst the new systems all tend to be quieter and smaller in their footprint than their R22 equivalent. There is also now a greater range of products available, allowing a building to have a wider choice of indoor unit to fit with the design or application.

Air conditioning control systems are radically different to those used with R22 systems and help ensure that your highly efficient system constantly performs as expected via improved time clocking, optimised temperature control and sophisticated control options.

## Notes

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# Products to meet the demand



**With years of experience and expertise in developing advanced air conditioning, Mitsubishi Electric's comprehensive range of solutions can improve energy issues whatever the building.**

Whether you choose to adopt a partial-replacement of your R22 air conditioning or wish to completely change the entire system, both approaches require new products.

Mitsubishi Electric's advanced product range offer something for every eventuality, whether you choose to install a complete system or require a Replace System which can take advantage of existing pipework, wiring and power supply.

There are two main types of air conditioning systems; **Split-Systems** which include the M Series and Mr Slim series, and **Variable Refrigerant Flow (VRF)** Systems which include the City Multi range.

Split-Systems are smaller and typically consist of one outdoor unit running up to four indoor units. These are ideal for small to medium sized applications.

VRF Systems can run numerous indoor units connected to one outdoor unit, making them suitable for medium to large applications.

## Notes

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## Points to consider with partial-replacement systems



**The common factors to be considered for both Split-Systems and VRF Systems when looking to re-use the R22 pipework are the condition of the existing pipework, its strength and the type of oil used within the original refrigerant.**

With an existing system that has stopped working because the compressor has broken, it is unlikely that the pipework will be re-useable, due to potential contaminants in the oil. Similarly, if the existing pipework has been exposed to high levels of moisture and air then it may have corroded causing it to be dangerous to re-use.

R22 refrigerant runs at a lower pressure than R410A, but if the pipework is to be re-used it must be able to withstand the running pressures of the new R410A refrigerant.

The pipework must pass pressure safety tests according to the regulation BS EN378-2:2008 (or latest equivalent). If it is not up to these standards then it must be replaced. Your installing Partner can advise you should you need more information.



## Notes

[illegible]

## Points to consider with partial-replacement systems



Finally, the oil used with R410A refrigerant can deteriorate if used with existing R22 pipework and its contaminants. To overcome this, oil which doesn't allow this to happen must be used or the R22 oil and its contaminants must be recovered to a safe level so that the issue will not occur again.

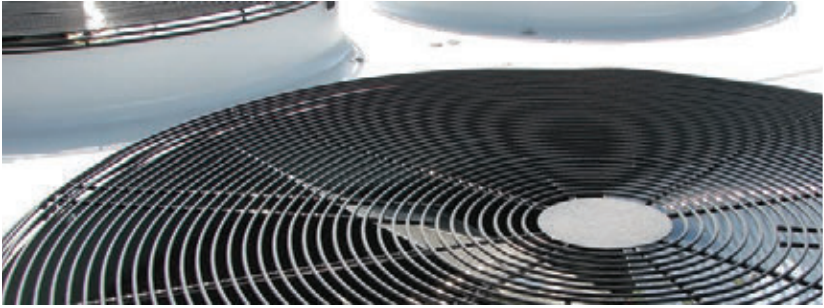
- Mitsubishi Electric have overcome these problems with technologically advanced air conditioning Replace Systems
- These technologies can also be used to replace R407c systems (the refrigerant used directly after R22), using the existing pipework and wiring

Mitsubishi Electric and its installing Partners have the expertise and experience to guide you through the process whatever the challenge. Speak to your installing Partner for more information.

## Notes

[illegible]

# Split-System air conditioning



**Perfect for small to medium applications such as retail units and small offices, Mitsubishi Electric has an extensive range of Split-Systems to suit.**

Mitsubishi Electric's standard Split-Systems can be used to replace both Mitsubishi Electric and other manufacturers R22 air conditioning systems.

Split-Systems tend to have simple piping and wiring layout, making the partial-replace method a cost-efficient consideration.

The Replace Technology in the Split-System range allows for the simple upgrade of air conditioning systems using existing pipework. The Mitsubishi Electric Splits range can also be used for full system replacements.

## Notes

[illegible]

# Split-System air conditioning



**To enable the re-use of existing pipework, the systems utilise one of the following technologies:**

- 1) Mitsubishi Electric's patented, unique Hard Alkyl Benzene (HAB) oil which is more tolerant of contamination. By combining these oils with developments in oil separator technology, it is possible for these models to use existing pipework.
- 2) The second option uses a friction reduction method inside the compressor, thereby suppressing the increase in temperature that causes refrigerant oil to deteriorate.

Split-Systems tend to use small pipework meaning the likelihood that it can withstand R410A pressures is higher due to its original specification but this should always be checked. If the control and power wiring is also in good condition this can also be used.

Mitsubishi Electric and its installing Partners have the expertise and experience to guide you through the process whatever the challenge.

## Notes

[illegible]

# Split-System air conditioning



## The products - M Series

Designed to cool or heat small to medium sized applications such as small office areas, the M Series range provides a versatile, yet affordable air conditioning solution.

The M Series is quick to install and includes one of the quietest units on the market (as low as 19dBA\*).

Wall mounted and floor standing indoor units are available in a one to one combination and on Multi-Split MXZ systems, up to 8 indoor units can be connected to one outdoor unit.

The MXZ range offers a range of indoor units that can be wall mounted, floor standing, ducted, ceiling cassette or ceiling suspended.

\*MSZ-GE25VA





## Notes

[illegible]

# Split-System air conditioning



## The products - Mr Slim

Suitable for cooling or heating a wide variety of applications such as offices or retail units, the Mr Slim range is one of the UK's best-selling air conditioning Split-Systems.

Combine the high levels of efficiency with the complete versatility that this range has to offer and the possibilities are virtually infinite.

This range offers Standard Inverter models, top of the range Power Inverter models and Mitsubishi Electric's unique Zubadan models to provide optimum performance at low ambient temperature conditions.

A range of capacities are available which can combine with a variety of indoor units including floor standing, ducted, ceiling cassette or ceiling suspended.



## Notes

[illegible]

# Variable Refrigerant Flow (VRF) air conditioning systems



**Designed for larger applications, our powerful VRF range offers high performance and optimum efficiency.**

Mitsubishi Electric's City Multi VRF Systems offer both heat pump and heat recovery technology. Heat pump systems deliver cooling or heating to a space, whereas heat recovery systems can simultaneously provide cooling and heating at the same time via separate fan coils, moving energy around a building.

Offering systems which can be used on new or existing pipework, City Multi provides products for a wide range of applications. Specialised Replace City Multi units can be utilised to replace and use existing pipework, wiring and controls for both Mitsubishi Electric R22 systems as well as those of other manufacturers.

## Notes

[illegible]

# Variable Refrigerant Flow (VRF) air conditioning systems



**Three main functions on the VRF Replace Multi enable it to re-use existing R22 pipework:**

**1) Automatic Oil Flushing**

The patented automatic oil flushing process collects all the oil and contaminants and removes them to an hermetically sealed container within the outdoor unit. This allows the R410A refrigerant to be run in normal operation as smoothly and efficiently as possible.

**2) Pressure Control and Safety**

Replace Multi systems have additional elements to control the pressure of the new R410A refrigerant. An LEV (Linear Expansion Valve), control of the compressor speed and an additional pressure sensor keep the refrigerant pressure at a safe operating level whilst still delivering the required capacity to the indoor unit.

To comply with BS EN378-2:2008 safety regulations (or latest equivalent), there is a high pressure switch in the outdoor unit to protect the R22 pipework allowing it to be re-used.

## Notes

[illegible]

# Variable Refrigerant Flow (VRF) air conditioning systems



## 3) Automatic Refrigerant Charge

The third function is not a requirement for R22 pipework, but does make installation much simpler. The system will automatically charge R410A refrigerant, calculating the correct volume of refrigerant to operate efficiently and provide the desired capacity by monitoring temperatures and pressures.

This is very useful when it is difficult or impossible to measure the pipe runs and diameters of the existing equipment (perhaps hidden in the ceiling grid, underground or in awkward risers). Although the refrigerant charge must be manually checked, this saves on both installation time and guess work.

An auto charge function is available within the Replace Multi range for both heat pump and heat recovery versions. Although ideal replacement should be planned around the mid seasons in Autumn or Spring, the automatic oil flushing operation can be performed in heating mode on heat pump models down to  $-10^{\circ}\text{C}$  ambient allowing replacement at any time of the year.



## Notes

[illegible]

# Variable Refrigerant Flow (VRF) air conditioning systems



## The products - City Multi

The City Multi range is Mitsubishi Electric's answer to large scale VRF applications. Along with the standard City Multi product used on full air conditioning replacement installations, Mitsubishi Electric offer specialist replace models which can utilise existing pipework, wiring and power.

City Multi offers a substantial increase in energy efficiency, with corresponding efficiency ratings. The City Multi Y Series range offers a simple and flexible solution where there is a demand for a changeover capability between heating and cooling for all fan coils, helping to ensure a constant, comfortable indoor climate.



## Notes

[illegible]

# Variable Refrigerant Flow (VRF) air conditioning systems



The City Multi R2 system can provide simultaneous heating and cooling through only two pipes rather than the conventional three which are traditionally used on heat recovery systems, reducing installation time, material costs and the possibility of leakage. Recovered energy can not only be moved around rooms within a building but can also be upgraded to heat water for sanitary use.

By transferring wasted heat in this way, substantial savings can be made on annual running costs and CO<sub>2</sub> emissions.

With a range of over 80 indoor units of varying capacity including floor standing, ducted, ceiling cassettes, ceiling suspended and wall mounted types, up to 50\* indoor units can be connected to one City Multi outdoor unit.

\*Up to 32 indoor units can be connected to City Multi Replace units.

## Notes

[illegible]

# The importance of Controls



**Operating a cooling and heating system without the right controls can prove costly to any business, but simple changes can make a world of difference.**

Reviewing a cooling and heating system provides a perfect opportunity to consider potential improvements in controls, not only for a new system but also for your currently operational air conditioning system.

Enhanced capabilities to control cooling and heating systems, and to anticipate, monitor and report their performance, provides massive opportunities to reduce energy use and running costs. More flexible, intelligence-based operation is increasingly demanded by customers, required by legislation and central to a solution's design.



## Notes

[illegible]

# The importance of Controls



## Our product range is supported by a comprehensive range of advanced controls.

Mitsubishi Electric offers a versatile range of products to complement both Split and VRF Systems. The most beneficial of these are the advanced controls which allow the new air conditioning systems to better optimise performance efficiency compared to the previous R22 equipment. Improved controls mean the system will only deliver what is required.

Local and central controllers offer a comprehensive range of functions and energy saving features such as set point limitation, detailed scheduling and night setback. These provide full flexibility of use, increased comfort and can dramatically reduce running costs and CO<sub>2</sub> emissions.

The controls will also highlight any errors or problems occurring within the equipment to assist a maintenance engineer.

Central controllers offer user-friendly features such as Internet access and control, visible floor plans and remote monitoring, making it easier to get the most out of the system.





## Notes

[illegible]

# Ventilation



**From ancillary products to added-value services, Mitsubishi Electric has an array of energy efficient solutions to enhance your building's energy use and running costs.**

Additional equipment such as mechanical heat recovery, fresh air ventilation from Mitsubishi Electric's Lossnay system, can be integrated with both Mr Slim and City Multi air conditioning systems.

Developed and refined over the past 35 years, the Lossnay system has perfected mechanical ventilation with the recovery of heat energy that would have otherwise been wasted. The units help to reduce overall energy costs by extracting stale air and then recovering the heating or cooling energy to either warm or cool incoming fresh air.

Utilising recoverable energy, Lossnay is able to save up to 30%\* on capital outlay by reducing the heating and cooling load in occupied space.



\* Calculated from the Lossnay Selection Software.

## Notes

[illegible]

# Sanitary Water Heating



**Water heating units such as the Mitsubishi Electric heat pump boiler can be added to a heat recovery VRF System to utilise waste heat.**

The system upgrades this to heat sanitary hot water for bathrooms, showers or kitchens. Whether full or partial-replace, sanitary water heating units can be added to the replacement R410A air conditioning system.



## Notes

[illegible]

# Case Studies

Our selection of Case Studies aim to provide an insight into how a number of different applications have successfully implemented full or partial air conditioning replacement to suit their needs.

- **St Clements, Daventry**  
The UK's first R22 Replace System still reaping efficiency benefits
- **Logic Group, Hampshire**  
Upgraded system utilises existing infrastructure to increase energy efficiency
- **Heyn Handling, Belfast**  
Forward thinking helped this company comply with legislation
- **Nota Bene Hotel, France**  
Hotel disruption kept to a minimum whilst guest comfort increased

[www.replace.mitsubishielectric.co.uk](http://www.replace.mitsubishielectric.co.uk)

# Proof of modern technology in action



## **The assurance of highly beneficial ‘Case for Replace’ applications are already in place.**

Many Mitsubishi Electric customers have successfully replaced old air conditioning systems run on the soon-to-be banned R22 refrigerant, in favour of modern, efficient and advanced systems using the widely proven and accepted R410A refrigerant instead. Replacing both Split and VRF systems, there are many examples to demonstrate the ease, affordability and overall benefits enjoyed by those who’ve invested in new, highly efficient air conditioning systems.

Within this section we aim to show a cross section of the many hundreds of different applications already in place and give an insight into the ease of installation, improved levels of performance and reduced running costs and carbon emissions now possible.

## Case Study:

# St Clements, Daventry



**The owners of the UK's first R22 air conditioning replacement system are still benefiting from lower energy bills seven years after the installation of the unique Mitsubishi Electric system.**

When St Clements Services Ltd, the owners of a small office block in Daventry were originally looking to replace their cooling-only air conditioning, they considered a number of options including an upgrade of their boiler and heating plant.

After discussions with Mitsubishi Electric, St Clements chose instead to replace the old R22 air conditioning system with a cooling / heating City Multi Y Series, using what was then, ground-breaking Replace Technology.

With a total area of 275m<sup>2</sup> on the second floor needing air conditioning to deliver a total cooling capacity of 30.2kW, a Replace Multi Y Series PUHY-P250YREM-A was specified to deliver cooling or heating with two PEFY-P100 ducted indoor units specified for two of the rooms and three PKFY wall mounted units for the others.



## Case Study:

# St Clements, Daventry

The Replace Multi system allowed St Clements to keep the existing pipework and wiring and update the indoor and outdoor units, whilst removing the old, environmentally unfriendly R22 refrigerant and introduce an R407c (another zero ODP refrigerant alternative to R410A) system instead.

Using the existing pipework significantly reduced the time it took to get the system up and running and allowed the new air conditioning units to be installed in days instead of weeks.

The speed of installation was a key factor in the company's decision but increased operational efficiency and excellent core reliability were also needed. St Clements has also benefitted from increased performance and control from the Replace System.

Monitoring before and after the installation of the Replace System proved that, even in 2005, the new system was able to deliver a COP of 3.28 and was 28% more efficient than the old R22 one.

This is because when the temperature outside is low, the Replace System does not consume as much power and reacts more quickly to changes in the outdoor temperature, with input increasing to compensate only when the outdoor temperature rises.

Further cost savings are also available from flexible controls, which monitor the complete system and ensure correct usage outside weekday office hours and at weekends, when little or no air conditioning is required.

## Case Study:

# The Logic Group, Hampshire



The Logic Group, based in Hampshire, specialises in the secure management of information and transactions across Europe. Both the company's two offices were running R22 refrigerant air conditioning systems installed in 1998, but the impending ban on R22 refrigerant, reduced performance, higher energy costs and increasing levels of maintenance made an upgrade of the ageing systems essential.

Mitsubishi Electric's City Multi YJM Replace Multi units were selected as the most cost-effective way to replace the existing R22 air conditioning with efficient R410A units. The Replace Technology meant that all existing power cables could be re-used along with the pipework which only required minor modifications for the new connections needed for additional indoor units.

The re-used pipework was automatically flushed to remove residual R22 mineral oil and the new units automatically charged the systems with R410A refrigerant which removed the need to measure pipe lengths. During normal operation the replacement units regulate the pressure of the new R410A refrigerant, which negates the need for new pipework and offers significant savings on cost and time. It also reduces any disruption during installation.

## Case Study:

### The Logic Group, Hampshire

AG150 touch screen centralised controllers were added to maximise energy efficiency, decrease energy usage and minimise running costs. The ability to upload and view CAD floor plans for the buildings offered enhanced control.

The introduction of fresh air to the offices via a low pressure hot water AHU system provided improved air quality and a more comfortable environment, whilst occupants benefitted from replacement indoor units that were quieter than previous models.

The new YJM systems exceed the criteria for Enhanced Capital Allowances (ECA) which mean the Logic Group could claim the tax benefit covering their capital outlay.

Following the upgrade, the energy consumption for one of the office buildings dropped by 22% and the other building which included adding significantly more equipment for a changed and upgraded application, had an annual reduction of 7% energy consumption. The total estate saved 120,225kWh (or £15,630) significantly reducing their CO<sub>2</sub> output by 65.5 tonnes.



## Case Study:

### Heyn Handling, Belfast



Heyn Handling Solutions, based in Belfast's harbour area, had been happy with the performance of their Mitsubishi Electric R22 air conditioning system since it was installed in 1992. However, as the system was nearing the end of its useful operating life, the time and costs involved in maintaining it and the planned phase out of R22 refrigerant meant that an update of the air conditioning system was required.

In order to minimise disruption to its business and to keep replacement costs down, the company opted to upgrade its air conditioning system using Mitsubishi Electric's Replace technology.

Using Replace Technology meant that the existing R22 pipework, control wiring, drains and electrics could all be re-used. It also allowed for additional new air conditioning units to be installed.

The Replace Technology cleaned existing pipework during commissioning to remove the build-up of any deposits and R22 mineral oil. This eliminated the need to install new pipework, reducing costs and avoiding the associated disruption and re-decoration.

## Case Study:

# Heyn Handling, Belfast

Old indoor units were replaced with the sophisticated and efficient City Multi R2 Series, including a new branch controller and condensing unit.

Internally, two-way blow cassettes were changed to four-way blow and extra cassettes installed in areas not previously served with cooling and heating.

The R2 series now provides the building with simultaneous cooling and heating using Mitsubishi Electric's unique 2 pipe heat recovery technology, which reduces the potential for leakages and helped to keep installation costs down.

Heyn Handling's previous system was capable of a COP of 1.74, but with the installation of the new technology this has risen to 4.27. This translates to an annual 55% energy saving efficiency which means lower energy consumption, lower running costs and lower carbon emissions.

Replace Technology offers an ideal solution for almost all applications and can be used with both the City Multi and Mr Slim ranges of air conditioning systems.

## Case Study:

# Nota Bene Hotel, France



**With a busy hotel on the outskirts of Paris, anything that disrupts business has to be avoided at all costs. And anything that reduces the number of bedrooms available for guests can have a dramatic impact on the bottom line.**

The owners of the Nota Bene Boutique Hotel, in Nanterre near the French Capital, wanted to increase the comfort for their guests whilst also improving the reliability and efficiency of their 10-year-old air conditioning units.

Their current air conditioning system was also showing operational problems and consuming too much energy.

The absolute priority though was avoiding disruption and minimising the loss of rooms during the replacement work. With Replace Technology from Mitsubishi Electric, all of the existing pipework was cleaned and able to be re-used for the new system.

In addition, both the communications and power wiring was able to be re-used which allowed the installation to be completed far quicker than it would have taken for a full, new air conditioning system.

## Case Study:

# Nota Bene Hotel, France

One of the major advances of Replace Technology, especially when replacing another manufacturer's system, is the automatic refrigerant charging function which means the installer does not need to know the exact pipe lengths before installation of the new air conditioning system.

Three City Multi outdoor units (PUHY-RP200 / 250 / 300YJM-A) now serve the cooling and heating requirements of the Hotel's 43 bedrooms and the 120 diner restaurant.

Wall-mounted PKFY indoor units were installed in each of the bedrooms in around two hours for each room, meaning that the Hotel was still able to maximise the amount of rooms available for guests. The work was also completed without needing any intervention in the hotel's corridors, again, minimising disruption for guests.

Individual PAC-SE51CRA simplified room controllers allow guests to control the temperature in their room, whilst a GB-50 and PC-controlled web browser system provides the Hotel owners overall control of use and energy consumption.

Monitoring of the Hotel has shown a 35% increase in COP from 3.26 to 4.39. The EER has also risen dramatically by 45%, from 2.65 to 3.94

## Notes

[illegible]



# Working with Mitsubishi Electric's recommended installing Partners

At Mitsubishi Electric, we have developed a standards - based Partner Programme to assure customers of the highest levels of technical installation and support at all times.

But we also go beyond that, because we consider other business factors to be important as well, such as how our installing Partners deal with health and safety issues. Becoming a Partner means that the company has agreed to uphold the highest values and installation standards, and this is why we will continue to train, support, facilitate and promote them, their staff and their business.

We have also developed a recycling programme to help our Partners and our customers do the right thing with old air conditioning equipment.

We make sure that both our businesses adhere to current and future legislation, because we believe that only sustainable thinking will lead to a sustainable business.

[www.replace.mitsubishielectric.co.uk](http://www.replace.mitsubishielectric.co.uk)

# Working with Mitsubishi Electric's recommended installing Partners



Installing Partner

Mitsubishi Electric operate a UK Partner Programme to ensure a fully trained and accredited installer network, delivering both optimum system performance and customer satisfaction.

- **Raising Industry Standards**  
Through the Mitsubishi Electric Partner Programme
- **Advanced, Intensive Training**  
Available to all installers throughout the UK
- **Pioneering the Way**  
Through a range of CPD accredited Information Guides to keep installers and customers fully informed of the changes in industry legislation and new technologies
- **Extended Product Warranty**  
Available through our installing Partners
- **Consistent, Professional Service Across the UK**  
Mitsubishi Electric Partners work to exacting standards to deliver an assured level of service

## Notes

[illegible]

# Green Gateway

Mitsubishi Electric has developed its Green Gateway philosophy to rise to the challenge of reducing energy use in the built environment.

The company is using its unique position as a leading manufacturer of cooling, heating, ventilation and control equipment to focus on how effective energy use in our buildings can help the UK tackle the triple challenges of climate change, fuel security and rising fuel costs.

- What is Green Gateway?
- Building a greener future
- Green Gateway philosophy and our guiding principles
- Generating truly sustainable buildings is the ultimate goal
- Our ECR approach - to improve energy use, reduce carbon and increase the way we do business

[www.replace.mitsubishielectric.co.uk](http://www.replace.mitsubishielectric.co.uk)

# What is Green Gateway?



**Quite simply, Green Gateway is the way we do business.**

Climate change, fuel security and fuel affordability are major challenges confronting everyone in the UK. As the biggest consumers of energy, buildings must be part of the solution. To make this happen, people in all areas of the sector - from construction through to renovation need to change the way they think and work together.

Green Gateway starts from the simple premise that all businesses, households and individuals can 'do the right thing' by adopting a 'Lean, Mean and Green' approach to meet the challenges in the right order.

- Firstly, reduce the need for energy consumption - **Lean**
- Secondly, correctly deploy and monitor the most appropriate and efficient equipment for your buildings - **Mean**
- Lastly, incorporate low and zero-carbon technologies where possible to create some or all of the energy required - **Green**

Mitsubishi Electric believes that this is the right thing to do from a business perspective, because in the long-term only sustainable thinking will lead to a sustainable business.

## Notes

[illegible]

# Building a Greener Future



**Buildings account for 44%\* of all UK greenhouse gas emissions (more than industry or transport), yet the majority of existing buildings will be in use for the next 40 years, so we have to find ways to answer the following question:**

How can we tackle this existing legacy with solutions that make the rapid, scalable impact needed today?

To reach the ambitious emission reduction targets the UK has set itself, our occupied spaces have to be made more energy-efficient, less carbon intensive and incorporate renewable energy where possible.

**The good news is that many of the solutions are affordable, scalable and available now.**

As part of the Green Gateway journey, we have examined our headquarters in Hatfield and looked at ways of implementing improvements that can be replicated elsewhere.

As a clear demonstration of what can be achieved, we have taken this 1980's-built glass-fronted, steel-framed building from an 'E' to a 'B' energy rating, utilising off-the-shelf technology and readily available skills.

\* BRE digest of UK energy statistics.

## Notes

[illegible]



# Green Gateway philosophy and our guiding principles



Changing behaviour - through debate and increased understanding of the crucial issues we face - is the ultimate goal of the Green Gateway. Guided by five core principles, it provides us with a compass for the way we do business.

## 1. Doing the right thing

The UK Government is unique in the emission-reduction targets it has set, the legislation it has introduced and the specific incentives it has developed to support these goals.

This, coupled with a changing market due to overwhelming environmental arguments and customers who increasingly wish to address these issues, add to the ever changing market that we find ourselves in.

We believe that increasing awareness of, and support for, broader energy-production and consumption goals are the right thing for our industry to do. To this end, Green Gateway is closely aligned with national and international targets and supports the creation of a built environment able to help meet them.

You can join the Green Gateway debate by joining the dedicated Green Gateway LinkedIn Group or following our Twitter account (@green\_gateway) to receive up-to-the-minute news and views from those within and outside the industry, including key opinion leaders.

## Notes

[illegible]

# Green Gateway philosophy and our guiding principles



## 2. Increasing efficiency

Achieving major and lasting reductions in running costs and emissions demand we use energy more efficiently. To do this we believe the priorities that affect the way equipment is selected, installed, maintained and controlled need to change. We also need to take a whole life cycle view when applying a solution.

## 3. Reducing carbon

Carbon will increasingly be given a direct value and as a result become more visible to those responsible for its consumption. It's crucial that we move away from burning fossil fuels on-site as these generate relatively high emissions. A future where electricity is the only end-use energy is both desirable and possible.

## 4. Promoting renewables

Renewable solutions applied to buildings enable a level of energy independence from the grid supply and reduce our reliance on fossil fuel, thereby aiding fuel security. In addition, users of renewably generated energy tend to be more aware of their consumption and so are more pro-active in reducing it – to the benefit of these individuals and society as a whole.

## Notes

[illegible]

# Green Gateway philosophy and our guiding principles



## 5. The way we do business

Ensuring the right solutions are selected, taking into account the product's entire lifecycle, requires more collaboration and diversification by all involved in the industry. It has changed the way we do business by ensuring that engagement with all those required to deliver truly sustainable buildings is at the centre of all our activity.

We are also open to learning how others do things, and look to exchange expert knowledge with our working Partners.

The best solution will always be an integrated solution.



## Notes

[illegible]

# Green Gateway philosophy and our guiding principles



Green Gateway advocates adopting an **ECR** Approach - to improve Energy use, reduce Carbon and increase Renewables

All buildings require heating, ventilation, power and often cooling. To do so by the most energy efficient means is critical.

We want these requirements to be delivered in ways that are as **Efficient** as possible, emit lower amounts of **Carbon** and, wherever possible, incorporate **Renewable** energy.

Through an "ECR" approach, Green Gateway will help to ensure that a building's needs and wants are reconciled at every stage



## Notes

[illegible]



# The way we do business



Meeting the UK's energy challenges head on demands more integrated thinking from everyone supplying cooling, heating, ventilation, power and associated technologies to buildings.

Green Gateway takes an approach that addresses the whole product life cycle, from pre-purchase to end-of-life.

## Join the quest for efficiency with Mitsubishi Electric

Today the opportunity to help shape the UK's energy future is greater than ever. So too is the need for more dialogue, collaboration and unity of purpose across the cooling, heating, ventilation and power solutions supply chain.

We invite you to join Mitsubishi Electric in forging the way ahead.



Online [www.greengateway.mitsubishielectric.co.uk](http://www.greengateway.mitsubishielectric.co.uk)



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Connect with us on LinkedIn: Green Gateway

## Notes

[illegible]

# Review - Site Audit

Date:	Client Name:
<b>Client Contact Details</b>	
Tel:	Email:
<b>Site Details</b>	
Address:	
Building Age:	System Name:
<b>Application</b> <small>(please tick)</small>	
Run Days: <input type="checkbox"/> 5 Days/Week <input type="checkbox"/> 7 Days/Week <input type="checkbox"/> Other	
Run Hours: <input type="checkbox"/> 8 <input type="checkbox"/> 10 <input type="checkbox"/> 12 <input type="checkbox"/> 14 <input type="checkbox"/> 16 <input type="checkbox"/> 24 <input type="checkbox"/> Other	
Type: <input type="checkbox"/> Office <input type="checkbox"/> Hotel <input type="checkbox"/> Retail <input type="checkbox"/> Bank <input type="checkbox"/> Leisure <input type="checkbox"/> Restaurant <input type="checkbox"/> Health <input type="checkbox"/> Education <input type="checkbox"/> Residential <input type="checkbox"/> Other	
Electricity cost (£/kWh)	
<b>Existing Air Conditioning Info</b>	
Type: <input type="checkbox"/> Splits <input type="checkbox"/> VRF <input type="checkbox"/> Other	
Capacity:	Year Installed:
Existing Controls Info:	
Replacement Priority:	
<b>Interest in Additional Services</b>	
Products: <input type="checkbox"/> Fresh Air Ventilation <input type="checkbox"/> Water Heating <input type="checkbox"/> Air Curtains <input type="checkbox"/> Comms Room <input type="checkbox"/> Other	
Controls: <input type="checkbox"/> Timer <input type="checkbox"/> Set Point Limit <input type="checkbox"/> Night Set Back <input type="checkbox"/> Central Control <input type="checkbox"/> Web Connectivity <input type="checkbox"/> Remote Access <input type="checkbox"/> BEMS <input type="checkbox"/> Other	
Energy Monitoring:	

# Building Plan