



Information Guide

The New 10%
Renewable
Energy Target

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Information Guide

This is an independent guide produced by Mitsubishi Electric to enhance the knowledge of its customers and provide a view of the key issues facing our industry today. The guide accompanies a series of seminars, all of which are CPD accredited. The changing face of construction in the 21st Century demands that designers, specifiers and suppliers work as teams to create better buildings - for occupants and the environment. Mitsubishi Electric aims to be a part of this by encouraging employees and customers to work together to increase their knowledge of the latest technology, legislation and markets.

Contents

- Page 2** What is the 10% Renewable Energy Target?
- Page 4** Putting it into action
- Page 6** Lean, clean and green
- Page 8** Further information

What is the 10% Renewable Energy Target?

As the UK Government tightens the regulations on buildings to drive up energy efficiency and sustainability, local councils are following suit by using their planning powers to encourage developers to use renewable energy sources.

One of the toughest stages of a development is winning planning permission. This can be a make or break stage for any construction project. Now local councils across the UK are introducing another challenge in the approval process - the 10% Renewable Energy Target. It has been introduced by a growing number of local councils whose objective is to enforce the use of renewable energy sources within their boundaries. Briefly stated, building projects must account for at least 10% of carbon emissions with some form of on-site renewable energy.

Previous Mitsubishi Electric Guides have dealt with Part L of the Building Regulations and the European Energy Performance of Buildings Directive – national legislation which will create more energy efficient commercial and domestic buildings.

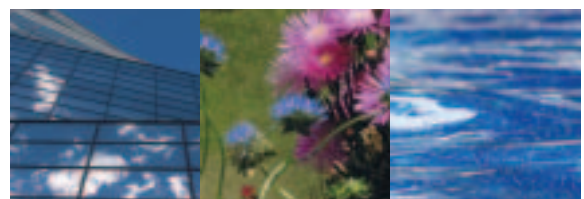
Local Government has been given the power by Westminster to support these legal requirements with their own rules. Planning Policy Statement 22 (from the Office of the Deputy Prime Minister) states: “Local planning authorities may include policies in local development documents that require a percentage of the energy to come from on-site renewable energy developments.”

Different local councils have worded their version of the 10% Renewable Energy Target differently, but they have generally followed the same outline. The Greater London Authority has led the way, with the boroughs of Croydon and Merton (it is often also referred to as ‘the Merton rule’).

The wording that Merton UDP uses is: “All new non-residential development above a threshold of 1000 m² will be expected to incorporate renewable energy production equipment to provide at least 10% of predicted energy requirements.” The word ‘expected’ here is significant, and indicates that the council is enforcing the rule strictly.

Croydon council states: “The Council will expect all development (either new build or conversion) with a floor-space of 1000m² or ten or more residential units to incorporate renewable energy production equipment to provide at least 10% of the predicted energy requirements.” The list in the box illustrated on the following page shows how many councils across the country are adopting the 10% Renewable Energy Target – and it is a growing number.

The target is already having an impact on the built environment. Croydon Council has examined 71 planning permissions which required renewable energy in the past two years. As a result of the 10% Renewable Energy Target, the new Croydon General Hospital incorporates 81 solar water heaters, 13 micro wind turbines and a 40kW photovoltaic array.





One very important point to bear in mind about this target is that 10% is only the starting figure. The intention is to increase this requirement to around 30% for residential and 20% for commercial buildings by the year 2010. The aim is not only to reduce carbon dioxide emissions, but also to stimulate the UK market for renewable energy sources. The table below shows how Merton Council plans to increase the requirements over the next five years, with a view to rapidly expanding the use of renewables.

One of the key questions for the construction industry is how the 10% targets fit in with Part L of the building regulations 2006. The simple answer is that if a proposed building is in a borough which has a 10% target, then the project must first meet the requirements of Part L, and then gain planning permission by meeting the 10% target.

It seems to require a lot of architects and design engineers. However, the two sets of rules do work together. Part L requires maximum energy efficiency in design and close attention to the efficient running of the occupied building. This means that CO₂ emissions are already minimised, thereby making the 10% target as low as possible.

It also means that clients who may once have rejected renewable energy sources as too costly will be forced to adopt them if they want to gain planning permission.

Local councils with 10% Renewable Energy Targets in place

London boroughs:

Barking & Dagenham
 Bromley
 Bexley
 Corporation of London
 Croydon
 Ealing
 Enfield
 Greenwich
 Haringey
 Havering
 Lambeth
 Lewisham
 Southwark
 Sutton
 Tower Hamlets
 Waltham Forest
 Westminster

UK:

Bedfordshire
 Belfast
 Blackburn with Darwent
 Bolton
 Calderdale
 Cambridge

Charnwood
 Chester
 Cornwall
 Derby
 East Devon
 Edinburgh
 Exeter
 Greenwich
 Kirklees
 Leicester
 Liverpool
 Manchester
 Newcastle
 North Devon
 Norwich
 Oldham
 Oxford
 Salford
 Sedgfield
 Sefton
 Somerset
 South Devon
 Sutton
 Telford & Wrekin
 Waveney
 Worcestershire

This table shows how Merton Council proposes to increase its renewable energy requirements over the the next five years.

Year	Low rise residential	Office	School/College
1 (2006)	10%	10%	5%
2 (2007)	15%	12.5%	7.5%
3 (2008)	20%	15%	10%
4 (2009)	25%	17.5%	12.5%
5 (2010)	30%	20%	15%

Putting it into action

So far, councils that have adopted a 10% Renewable Energy Target have been fairly prescriptive about what technologies they consider suitable. There are seven key renewable energies which have been highlighted:

- Wind (building integrated turbines)
- Solar thermal
- Photovoltaics
- Ground source heating
- Ground source cooling
- Biomass heating
- Biomass combined heat and power (CHP)

There are also a number of techniques and technologies which are not considered suitable to include in the 10% target, even though some are encouraged and can be used to reduce the overall energy requirements of a project. The list includes: passive solar heating; daylighting, natural ventilation; solar shading; incineration of domestic waste. Also, developers cannot simply propose to purchase power from a 'green' tariff, since future occupants could change energy supplier.

The Greater London Authority has taken a strong line on its renewables policy. As part of this, it has designed a Renewables Toolkit to help both designers and planners get to grips with putting the rules into action. Clearly, local councils can enforce the rules according to their own requirements, but London's Toolkit is the first of its kind and sets out a standard method for demonstrating compliance.

One of the most important aspects of the GLA recommended approach is providing an Energy Assessment of the potential project, so that planners can see exactly how renewable energy is being used on the site. This will be a vital part of winning planning permission, and it should be remembered that many planners are not expert in renewable energy sources, so a straightforward structure and non-technical approach will be appropriate.





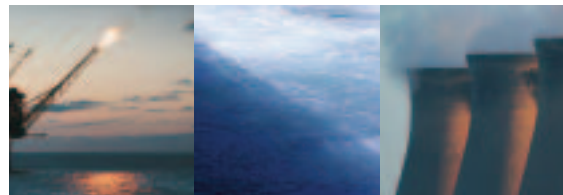
The assessment should include the building's 'energy or heat needs'. This means all the uses including cooling, heating, hot water, ventilation, lighting, equipment and appliances. The energy requirements are calculated in terms of carbon dioxide emissions (rather than kWh). This measurement provides a level playing field for comparing energy sources.

If the proposed building falls under the requirements of Part L 2006, it will be possible to use figures from the compliance calculations (see *the Mitsubishi Electric Guide to Part L 2006 for more information*).

Another key element of the Assessment is demonstrating the feasibility of a particular renewable technology - or the lack of it. It will not be sufficient for developers to say, for example, that wind turbines are not financially feasible. The design team will be required to outline in detail why a particular technology has not been used, as well as showing the logic for their final selection.

It will also be useful to include details of energy efficiency measures which are included in the proposed building. This is important because although the 10% target is about encouraging use of renewables, the underlying assumption is that the buildings will also be energy efficient. For example, this is where use of a hybrid cooling strategy which combines natural ventilation and comfort cooling can be discussed. Also, intelligent building energy management systems which ensure efficient operation should be mentioned, as they can make big savings in energy use.

The 10% Renewable Energy Target will have a fundamental effect on the planning stage for buildings. To date, the emphasis has been on the visual aspects of a project. The new renewable energy targets mean that planners will also be examining closely the energy requirements and carbon emissions of proposed construction projects. In the past, choices about building cooling systems or controls have been far removed from the planning stage, but now their impact on energy use will push them much further up the agenda.



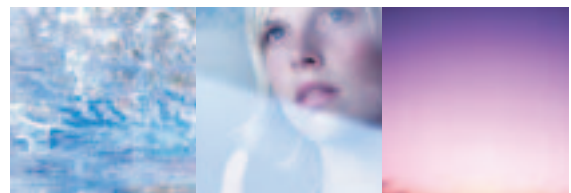
Lean, clean and green

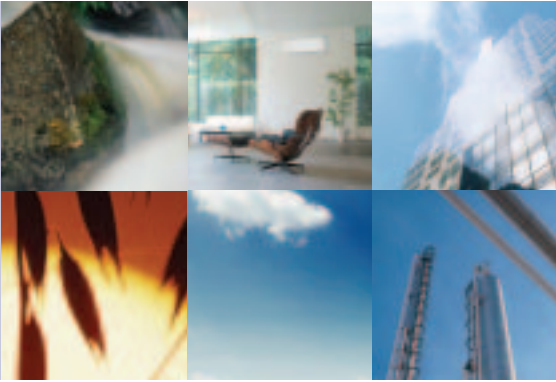
The question of where our energy will come from in the future is often debated and there are many conflicting theories of what will be the most commonly used. Prime Minister Tony Blair has recently indicated a preference for the UK to generate more power from nuclear sources. This has the advantage of being low carbon, though there are issues with nuclear waste.

For architects and engineers though, the more pressing problem will be what renewable energy sources to use on projects that fall under the 10% target. Clearly, they will be looking for a reliable energy source, preferably using technology which does not have high capital or maintenance costs.

Like the nuclear approach, all renewable sources have their advantages and associated challenges. For example, building integrated wind turbines are often seen on public projects, and have the advantage of being a highly visible commitment to 'green' energy. However, a 1 Mw wind turbine has a 44m rotor diameter, with a 65m mast, and must be at least 60m from buildings. Larger turbines give better economies of scale and provide faster payback. Further, in urban areas, wind speeds are rarely high enough to achieve the best power output from a wind turbine.

Photovoltaics, or solar panels, are another option. They have been in development for a number of years, and while the price of this technology is falling, it is still one of the more expensive renewable energy options. Photovoltaics can be integrated into the façade of some buildings, though this is not always an option.





Wood burning boilers are an increasingly popular choice with engineers. They are a relatively simple technology, with the main difference from other boilers being the fuel. The availability of wood pellets in urban areas has been raised as a possible problem, but as use of the boilers increases, there are a growing number of suppliers available.

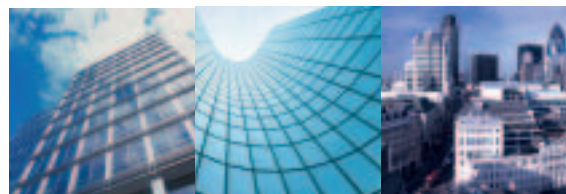
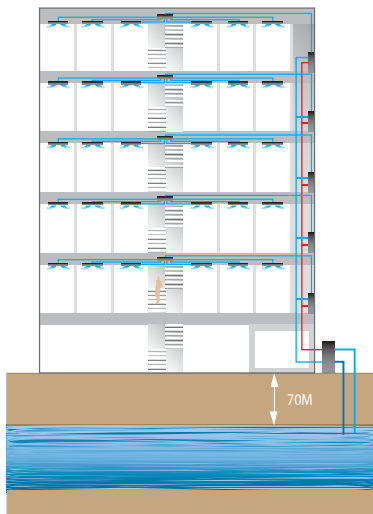
One of the increasingly attractive renewable energy options is ground source cooling and heating. These systems use pipes running into the earth to gain or lose heat from the building's system. They can be closed loop, running in a single connection; or open loop into an underground water source, or aquifer. Effectively, the ground source technology uses heat from the earth which stays at an almost constant temperature. The underground nature of this technology also means that it is very useful in urban areas – the pipes can be placed under car parks, or even in the building's foundations. (See the Mitsubishi Electric Guide on Water Cooled VRF Systems for more information).

There are arguments against on-site renewable energy sources - that they are not very cost effective compared to energy saving initiatives; it is far less efficient than centralised power generation and it can also simply be impractical. However, by encouraging the use of on-site renewable, local councils are making a public commitment to sustainability.

Whatever renewable technologies come along in the future, a corollary of this drive to greater use of sustainable energy sources is that in order for any of the renewable energy to be effective, buildings must become more energy efficient. This will drive clients to seek out services equipment which can demonstrate high efficiency at various levels of operation so that energy requirements are minimised and therefore renewable targets are easier to meet. The Greater London Authority advises developers to use less energy, to be more efficient and then to think about renewables, or as it states: "Be lean, be clean and be green".

Ground source application:

Open loop



Further information

More information on the 10% Renewable Energy Target can be found on the Greater London Authority website: www.london.gov.uk

A free electronic copy of the Renewables Toolkit is available from: www.london.gov.uk/mayor/environment/energy/docs/renewables_toolkit.pdf

If you missed the CPD seminar on **The 10% Renewable Energy Target**, you can call your Mitsubishi Electric Regional sales office to arrange an in-house presentation of this information.

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