



Implementation of the EPBD in Malta

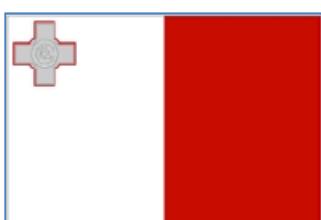
Status in November 2010

Services Division

Ministry for Resources and
Rural Affairs



Malta



1 > Introduction

Malta implemented the EPBD by means of Legal Notice 261 of 2008 (Malta Resources Authority Act - Chapter 423) Energy Performance of Buildings Regulations, 2008. This legislation supersedes Legal Notice 238 of 2006 but keeps the former technical guidelines on the “Minimum Requirements on the Energy Performance of Buildings”. The new legislation transposed all of the Directive’s clauses into national law. The process of revising the current minimum requirements and legislation will start in 2011 when Malta would have gained some experience from the current implementation.

This report describes the current status of implementation and discusses the effective way forward for the implementation of the EPBD in Malta. It addresses certification and the underlying development of the calculation, methodologies, inspection systems, the training of qualified energy performance assessors, including the logistics of quality control and auditing, information campaigns, incentives and subsidies.

2 > Certification

Certification of buildings

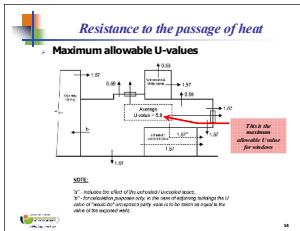
National website:

> mrra.gov.mt/epc

In Malta, the implementation of the EPBD is the overall responsibility of the Malta Resources Authority (MRA) under the Ministry for Resources and Rural Affairs (MRRA). The Building Regulation Office (BRO) is co-ordinating and managing this process. The BRO set up, designed and developed the certification system, which is based on a central national electronic registry and database.

Legal Notice 261 of 2008 on the Energy Performance of Buildings Regulations, 2008 was officially published on the 21st of October 2008 and then came into force on the 1st of January 2009. This law continued to build on the then current Legal Notice 238 of 2006 on the energy performance of buildings in Malta which was first published on the 6th of October 2006.

The first part of the current legislation reaffirms the regulation of the Minimum Requirements on the Energy Performance of Buildings, Technical Guidance Document F, notified in the Gazette by Government Notice No. 1002 of 2006. These regulations specified that all new buildings and existing large buildings that undergo major renovation or alteration, and whose building permit application was received by the Malta Environment and Planning Authority (MEPA) on or after the 2nd of



Minimum requirements in Document F - winter mode

January 2007 had to comply with these regulations. Buildings that were subjected to a change of use and whose building permit application was received by MEPA on or after the 2nd of January 2009 have also been included.

Studies on the technical, environmental and economic feasibility of alternative energy systems also have to be carried out, according to this new legislation, in cases of large buildings which involve outline or full development permission applications received by MEPA on or after the 2nd of January 2009.

The second part of the current legislation sets three timeframes for owners, public entities and/or their respective agents, to commission and issue the Energy Performance Certificates (EPCs) of buildings - based on the design rating of the building if the building is not yet constructed and/or finished, or the asset rating, if the building is already constructed and finished.

Starting from the 2nd of January 2009, EPCs had to be issued for all residential buildings (dwellings) which had to be newly designed, sold or rented out.

As from the 1st of June 2009, EPCs had to be issued on all non-residential buildings that were being newly designed, sold or rented out.

Also starting from the 2nd of January 2009, persons or entities in charge of a number of categories of existing public buildings had to ensure that an EPC based on the asset rating of the building would be commissioned and displayed at all times in a prominent place which is clearly visible to the public by not later than the 2nd of January 2010. These categories include:

- > Large buildings that are used by, or are providing services to, more than 500 persons daily.
 - > Commercial banks and post office buildings having a useful floor area of over 100 m², irrespective of the number of persons using or visiting such building.
 - > Showrooms, shops and shopping complexes having a useful floor area of over 1,000 m², irrespective of the number of persons using or visiting the building.
 - > Cinemas, dance halls, discotheques, gambling halls and wedding halls having a total useful floor area of over 500 m², irrespective of the number of persons using or visiting the building.

The EPC shows the calculated primary energy use and CO₂ (carbon dioxide) emissions. An example of an EPC for dwellings is shown below. Certificates can only be issued by qualified Energy Performance Assessors for Buildings (EPB Assessors). EPB Assessors have to be architects or engineers graduating at the University of Malta, or professionals with equivalent degrees (refer to section 4 for more information). The list of EPB Assessors is updated and available for viewing by the public on the Building Regulation Office web portal at mrra.gov.mt/epc.

The energy performance certificate

The EPCs are the end-product of the certification process. This document shows the calculated energy use rating for existing (asset rating) or designed (design rating) residential buildings and includes recommendations for improving their energy performance. The EPC is based on the design rating of the building if the building is not yet constructed and/or finished, or the asset rating, if the building is already constructed and finished.

The energy use or EPRDM rating scale ranges from 0 kWh/m².year (calculated low energy use due to high energy efficiency) to 280 kWh/m².year (calculated high energy use due to low energy efficiency). The dwelling's CO₂ emission rate (DCER) is also shown on a scale ranging from 0 kg/m².year to 70 kg/m².year beneath the main energy use scale.

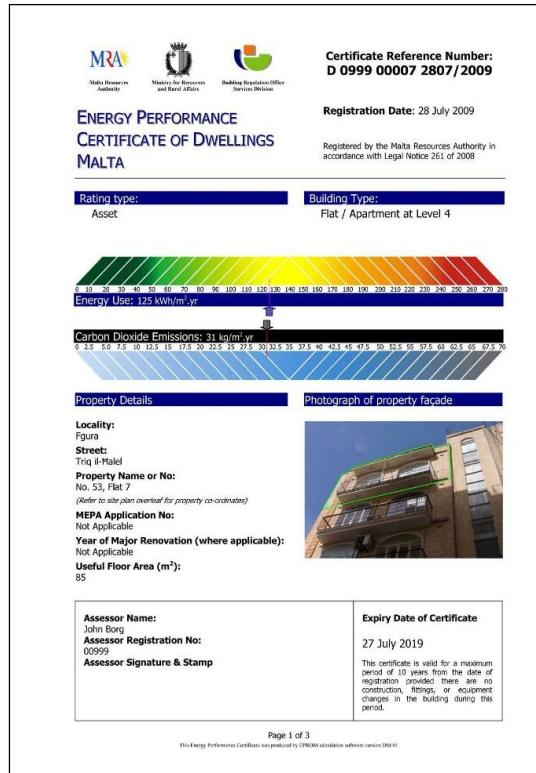


Fig. 1 - First page of the EPC: Asset rating certificate.

The real benefit of any EPC lies in the recommendations given to the building owner. These are included in page 2 of the certificate. As shown in Fig. 2, the suggested improvements include a short description of what can be done to reduce energy use. The EPB assessor may also include a cost estimate for implementing such measures, and the calculated energy savings and the impact on the energy rating if all measures were implemented. These recommendations are all tailored for the certified building and are not selected from a common database based on typical situations.

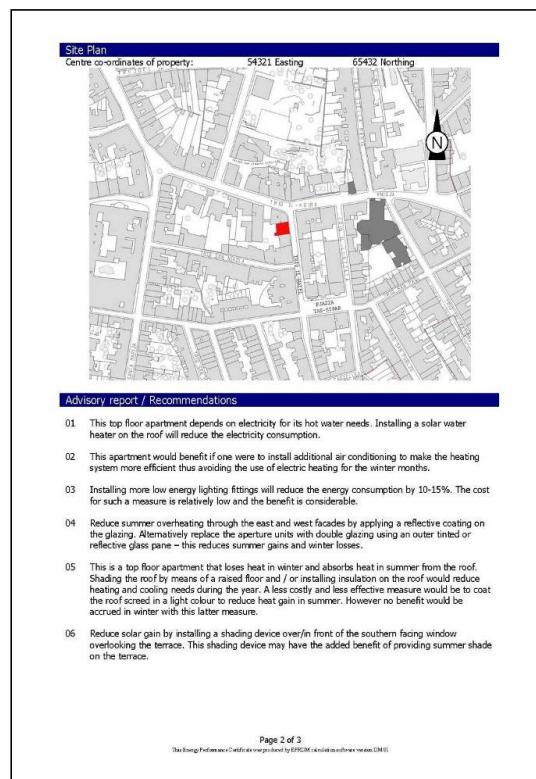


Fig. 2 - Second page of the EPC: Recommendations

The third page includes a detailed set of descriptions listing the materials, building fabric components, services installations and renewable energy sources that affect the EPRDM rating of the building.

The EPC is valid for 10 years. Public display certificates will have to include the simultaneous display of the asset and operational ratings. The latter will have to be issued within a period not exceeding five years of the first display of the EPC, and updated every successive three years.

In cases where building permit applications were received by MEPA on or after the 2nd of January 2007, all new buildings and existing large buildings undergoing major renovation or alteration, have to comply with the Minimum Requirements.

As from the 2nd of January 2009, all residential buildings have to be certified when they are being newly designed, sold or rented. The owner is required by law to provide an EPC to the prospective buyer or tenant within the period of the promise of sale or at the time of signing of the sale agreement, or rent agreement.

As from the 1st of June 2009, all other buildings have to be certified when they are being newly designed, sold or rented.

In the case of buildings that are being sold or rented, the respective owners must engage a registered EPB Assessor who has to inspect the property and assess the building taking note of its volume, surface areas, and party wall perimeters, the type of construction used (walls, windows, roofs, floors, insulation, roof colour, external shading, etc.), any permanent air-conditioning or boiler installations, the lighting installation, the hot water system and any systems using renewable sources of energy including rainwater re-use. The EPB Assessor will then calculate the energy use rating of the building and issue a registered EPC. The same energy use rating scale is used for those buildings that were designed before the implementation of the minimum requirements for the energy performance of buildings.

Additional information									
This certificate has been based on the following main building characteristics, material composition of elements and systems									
Opaque elements (including finishes)									
Walls: Goliherina limestone single leaf (230mm) external walls at the back rendered in light colour; double leaf external walls (230mm - 90mm - 230mm configuration) at the front. Roof: 175mm RC slab with 150mm <i>torbis</i> and 75mm concrete screed with concrete tiles on top. Surface is finished in grey colour.									
Floors: Floor slab is assumed 175mm concrete, 100mm <i>torbis</i> and ceramic tiling – the floor lies over another apartment.									
Windows: Aluminum frame. A few windows at the rear are double glazed. All others are single glazed.									
Doors: Main door is in timber. Back door overlooking terrace is single glazed with an aluminum frame. The front doors overlooking balcony are single glazed aluminium framed doors.									
Rooflights: None.									
Shading Devices: A horizontal shading device is present on the facade. The apertures overlooking the back terrace have horizontal shades on top.									
Systems									
Space Heating: Space heating is assumed as direct electric heating in all areas.									
Space Cooling: Less than 40% of the area of the living room is air conditioned. All areas are considered as being cooled by non-inverter type air-conditioners.									
Domestic Hot Water: Storage type electric water heaters in kitchen and bathroom.									
Renewables									
Solar Water Heater/s: None installed.									
Photovoltaic panels: None installed.									
Wind Turbines: None installed.									
Water cistern: None.									
Others: N/A									

Fig. 3 - Third page of the EPC: Detailed information.

Screenshots from parts of the software used to calculate the Energy Performance Rating of Dwellings in Malta (EPRDM)

The calculation methodology for the Energy Performance of Residential Dwellings in Malta (EPRDM) is described in the manual accompanying the energy performance calculation software. The calculation procedure takes account of the weather climatology and net energy required for space heating and cooling, water heating, lighting, and ventilation, after subtracting any savings from energy generation

technologies. It calculates the annual values of delivered energy consumption (energy use), primary energy consumption, and CO₂ (carbon dioxide) emissions, both as totals and per m² of total useful floor area of the dwelling per annum.

The procedure is designed to be compliant with the national transposition of the EU's Energy Performance of Buildings Directive (EPBD) and is based on the CEN standards, in particular, ISO EN 13790:2008 "Energy performance of buildings - energy use for space heating and cooling." It consists of a monthly calculation within a series of individual modules. The individual modules contain equations or algorithms representing the relationships between various factors which contribute to the annual energy demand of the dwelling.

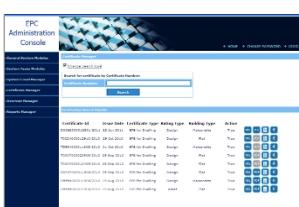
The calculation methodology for non-residential buildings is being developed and will be based on the UK's Simplified Building Energy Model (SBEM) national calculation tool.



The EPC Portal Website with secure login through the electronic ID system

Once the energy use rating is calculated and the required improvement measures are identified, the EPB assessor has to perform a secure login on a web-based central registration system. Here, the assessor has to upload the XML file containing the input data, energy use rating and CO₂ emission calculation. This file is checked by the system for consistency and compatibility with the, then, current version of the methodology calculation software. A photograph of the outlined building façade (for asset rating certificates) or elevation drawing (for design rating certificates) and an image of the site location plan have to be uploaded as well. The recommendations and a description of the building envelope including the roofs, walls, windows, doors, HVAC systems and any renewable energy sources of energy are then entered online so that they get displayed in the final EPC. Before officially registering the EPC, the assessor may save the certificate in a temporary format online and access it later to change the recommendations and building description, if necessary, but not the XML data or image files. The system has been designed to handle the registration fee payment and certificate registration in real time. When the registration fee is paid, the contents of the EPC can no longer be modified and the certificate, in PDF form, is stored in a secure area accessible only to that particular EPB assessor. At this stage, the EPC is stored in the central database together with the accompanying XML file, the latter being made available to the department for verification and the auditing part of the process. This way, the assessor can print the certificate from his office as soon as the registration is made

Under Maltese legislation, the building owner is responsible for commissioning an EPC and will pay from 250 € to 450 € for a design rating residential EPC and between 400 € and 750 € for an asset rating residential EPC to cover professional fees. The MRA charges a 75 € registration fee for each certificate registration, which covers part of the expenses used to run and update the EPC web portal. An owner, who fails to produce the certificate to the authorities, when requested to do so, can incur a fine between 500 € and 1,500 €.



The EPC Portal backend checks on EPCs through the certificate manager



QA through the Reports Manager - selection of certificates for checking and auditing purposes

Quality assurance (QA)

The quality of EPCs relies to a large degree on self regulation, which is reinforced by the training background of EPB assessors. The latter must have a professional degree in engineering or architecture and can only obtain their qualification after participating in an Assessor Training Programme for the Energy Assessment Procedure for Dwellings in Malta and obtaining a high grade in the final test. This topic is explained in more detail in chapter 4.

The first quality check is carried out on the EPC Web Portal, which automatically verifies the pattern in the uploaded XML data file and rejects it if found to be in a non-compliant format.

After the EPC is issued, it may be checked by internal auditors who would carry out a visual verification of the EPC, in a desk based review, including running a check on the XML data and the result it produces. However, it may undergo a deeper audit which would end up in detailed inspections where the assessor's data collected from the building, including all supporting documents such as drawings, sketches, notes, photos, and receipts of specific building materials are manually examined by an inspector. An on-site inspection of the building may also be carried out. Detailed

audits, especially those involving complicated buildings, can also be outsourced to external independent auditors.

A number of certificates will be routinely inspected for quality assurance purposes. This will include a random sample of about 5% or more from all certificates, a check on at least one EPC per assessor per year, checks on EPCs that are repeatedly issued on the same property, checks on EPCs with out-of-range values and checks following complaints from clients.

Depending on the quality of work encountered and the degree of errors in the EPC being audited, the certificate may have to be revoked and the EPB Assessor may be required to re-issue the EPC at his or her expense. In cases where there are serious offences, the legislation provides the authorities with the necessary tools to issue fines or suspend the assessor's registration.

To date, no certificates have yet been registered officially, although a number of energy audits have been carried out. The different authorities involved, such as the Malta Resources Authority, the Malta Environment and Planning Authority, the Commissioner of Inland Revenue and the BRO are co-ordinating their efforts to provide enough information for the BRO to start enforcement measures. If these efforts do not give the desired results, there is a possibility that the legislation may have to be changed to make sure that EPCs are carried out on a more forceful level.

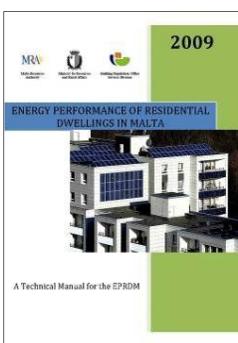
3 > Inspections - Status of implementation

Inspections on boilers and air-conditioning systems are still in their early stages. The methodology for boilers has been based on the CEN standard MSA EN 15378:2007 "Heating systems in buildings - Inspection of boilers and heating systems", that for air-conditioning installations follows guidelines in TM44: 2007 "Inspection of Air Conditioning Systems" issued by the Chartered Institution of Building Services Engineers. The methodology, reporting and recommendation formats on how to carry out these inspections will be issued during 2011. The report will include the running condition, efficiency and design adequacy of the installations and the accompanying recommendations will include practical details on how to improve the overall system efficiency.

The inspection reports will be centrally registered on the EPC Web Portal which will allocate a unique authentication number for each inspection report. Audits will be carried out on the reports to check their quality and effectiveness.



EPRDM Courses - advert for courses 10, 11 and 12



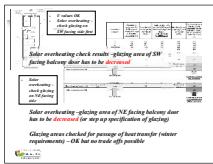
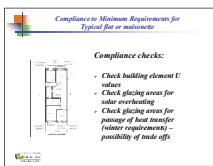
EPRDM Software manual

4 > Qualified Experts

In Malta, prospective EPB assessors for dwellings must already have a professional degree in engineering or architecture, or be registered as an EPB assessor in another EU Member State. Those wishing to qualify as EPB assessors will have to successfully undertake a period of training approved by MRA on the assessment of the energy performance of buildings constructed in Malta. Successful participants will have to obtain an overall pass mark of at least 80% after having attended at least 80% of the course lectures.

After undergoing the EPB assessors' training course sessions, the participants have to:

- > Be well versed on the key objectives and background to the EPBD, the implementation in Malta including the legislation, minimum requirements and EPC registration and administration.
- > Demonstrate the ability to accurately collect data from plans, specifications and physical surveys and to correctly calculate the energy demand of dwellings and the associated CO₂ emissions performance using



Slides from lectures presented to professional audiences explaining the application of minimum energy performance requirements.

the EPRDM software for both new and existing dwellings of varying complexity. The course participants have to be able to assess and apply lighting and internal loads, transmission of heat through the building fabric, ventilation, solar gains and energy use of permanent building installations in their calculations.

- > Produce EPCs and Advisory Reports for residential buildings making recommendations to improve the energy performance of dwellings.
- > Explain the significance of varying the specifications for dwellings.

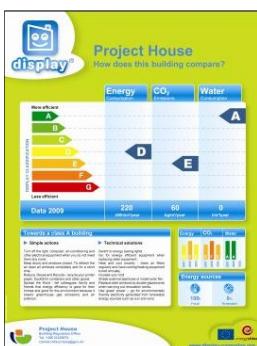
The participants must undergo a test at the end of the course that will:

- > Assess the participants' understanding of the EPRDM methodology, EPC policy, QA requirements, and surveying dwellings; and examine the participants' ability to recall, apply theory, define information and identify those products and systems in a dwelling that affect the EPC.
- > Oblige learners to demonstrate their ability to use the EPRDM software during a practical supervised session - for a previously unseen dwelling - and to produce an EPC and Advisory Report. The practical test requires the candidates to apply all aspects of the EPRDM software.

The BRO has successfully organised twelve courses for Energy Performance Assessors of Buildings (Dwellings). Most of the course participants - about 97% - managed to qualify and register with the MRA as Energy Performance Assessors for Dwellings. At present there are 161 registered EPB Assessors.

Similar training procedures will also have to be undertaken by qualified professionals who wish to participate in an energy performance assessors' course for non-dwellings based on the respective methodology and calculation software.

5 > National Information and Communication Campaigns



Display Campaign Certificate for a government owned building



Lectures presented during an eco fair event in March 2010

The need of informing citizens on certification

The Building Regulation Office in co-ordination with the Ministry for Resources & Rural Affairs Public Relations Office has been actively involved in informing the public on the EPCs by taking part in several events such as:

- > The promotion of the Display Campaign of certificates in public buildings and schools. The campaign will also help in paving the way for the implementation of the national obligations of the Directive.
- > Weekly information sessions and programmes on Radio and Television broadcasts with live phone-ins from the public and video footage on energy efficient design principles in local buildings.
- > Several seminars and presentations targeted towards different audiences such as the general public, architects and engineers, building contractors, estate agents, research bodies and students. Seminars have been sometimes organised as single events or as part of a larger trade fair venue or conference setting.
- > Promoting energy efficiency themes with brochures and videos in various events through a supporting campaign called the Switch campaign.
- > Preparing and delivering a series of lectures for an in-service course for teachers on Climate Change and Energy Efficiency in Buildings.
- > Delivering lectures on the EPC and the centralised Web Portal during the EPRDM Energy Performance Assessors' courses for Dwellings.
- > Co-ordinating summer courses for young students on energy efficiency of buildings & climate change.
- > Contributing towards the creation of brochures and web information material with frequently asked questions on the EPC and tips on energy saving measures.



A brochure on energy efficiency in buildings

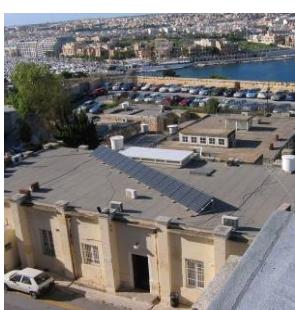
Fig. 4 - A brochure explaining the significance of the EPC



Advert on the provision of energy efficiency light bulbs to all Maltese families



Grants on solar water heaters and PV panels



Photovoltaic panels installed on a government-owned building

6 > National incentives and subsidies

The government provided incentives mainly in the form of rebates/subsidies or grants on the purchase and installation of:

- > Energy efficient light bulbs - free provision to every family in Malta
 - > Air-conditioners with a minimum Energy Efficiency Class A and an output equal to or less than 12kW
 - > Double glazing
 - > Solar water heaters
 - > Roof insulation
 - > PV panels
 - > Micro wind turbines.

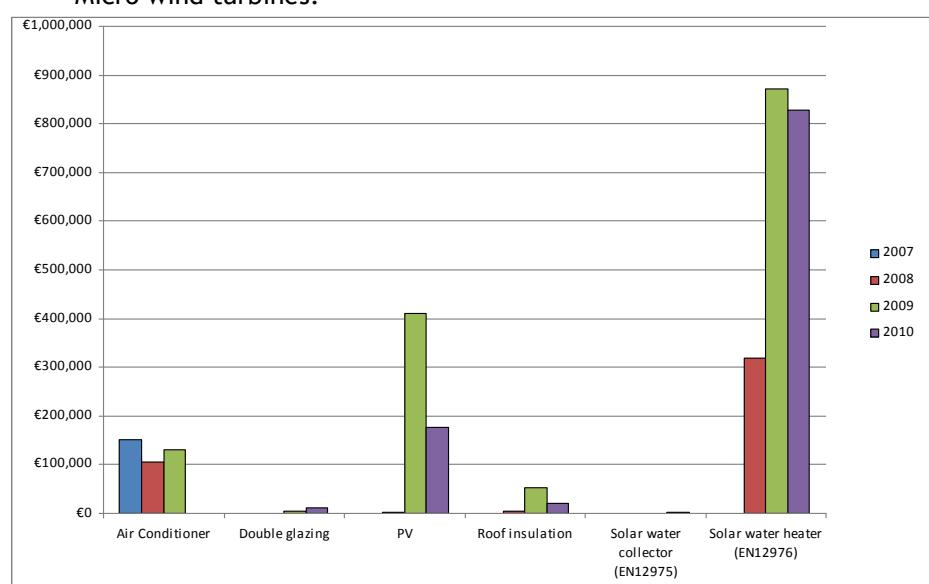


Fig. 5 - Government grants on installations, fixtures and renewable energy systems.



Advert promoting the use of solar energy to the industry.



Slides, presented to the general public, illustrating how different construction practices affect energy performance in buildings.

The renewable energy source installations all have a positive effect on the EPRDM rating. Awareness on renewable technologies is progressively increasing by the government's continued promotion of these technologies.

There is scope to incentivise EPCs with lower energy use ratings, thereby making EPCs more popular with prospective buyers and property developers.

7 > Impact of the EPBD at national level

Evolution of Minimum performance requirements in building regulations

Before Legal Notice 261 of 2008 was introduced, there was no legislation regulating minimum energy performance requirements in buildings. The new legislation has introduced requirements for thermal insulation in roofs, limits on window sizes depending on solar gains, improved glazing, the imposition of power and timing regulating controls on heating and cooling systems, the conservation and re-use of rainwater in specially designed systems and increased awareness of the benefits obtained from renewable energy sources. The thermal efficiency of walls that was adopted reflects the local practice of building double walls with an inner and outer leaf constructed with stone blocks and separated by a cavity, which practice was being replaced in new constructions by the use of single leaf hollow concrete blockwork with lower thermal efficiency. These minimum values will in future be upgraded so as to be able to reach the targets that will be imposed by the *Recast* of the EPBD.

Other impacts

Not enough data on impacts is available, however large projects are being referred to the BRO for consultation before their planning permits are issued. Appropriate revisions to the building design and specifications are being requested in cases where the buildings do not meet the minimum requirements. There are cases where the project proposals now exceed the minimum requirements.

Local manufacturers of concrete blockwork are seeing a window of opportunity. They are now researching on ways of creating improved blocks with good structural and better thermal properties. The same thing is happening with local manufacturers of apertures who are seeking new suppliers of materials to introduce better insulated aperture frames and glazing. A considerable number of importers of domestic appliances are also taking up a market share by providing solar panels, solar water heaters and domestic wind turbines.

8 > Conclusions and future planning

The impact of applying energy performance requirements in new and renovated buildings is limited at the moment. Significant reductions in energy consumption will probably be achieved when zero carbon footprint buildings are promoted and constructed on a wider scale by the building sector. Currently, less than 6,000 new buildings are built each year in Malta and, despite the recent growth in the rehabilitation market, major renovations still do not have a significant impact. Therefore, the EPBD requirements for new buildings and major renovations will certainly bring important energy savings in the near future, although new and renovated buildings only represent a small share of the entire building stock in Malta.

To achieve real energy savings in the building sector, significant incentives to the improvement of existing buildings are needed and certification can play its part. The recommendations made by the experts in the certificate are important guidelines that the owner of the building can make good use of, either in the

context of a renovation, or an individual cost-effective measure. Financial concerns about the investment cost and applying the payback period for energy efficient technologies is still a major barrier, though.

The public may have been unaware of the real energy use in the past, however this trend is changing. There are changes in the daily patterns of energy use due to the recent heavy rise in energy tariffs. The increased costs have induced many to economise on heating and cooling, but this trend may be about to change as more buildings are constructed or refurbished with higher levels of energy performance qualities. This may lead consumers to once again increase their energy use, albeit in a controlled manner.

On the other hand, additional training has to be offered to architects, engineers and qualified experts, to improve their skills in energy audits and share best practices in economic and technological building improvement solutions.

Although there is considerable interest on the EPBD and certification from the building professions such as architects, engineers and estate agents, no EPCs have been officially registered yet. Buyers seem to prefer not to enforce their right to ask property sellers to provide EPCs because the perception is that the cost of the certificate will be added to the value of the property. The Government had drawn up the legislation on a *Self Regulatory basis* hoping that buyers would want to impose their right to have information on the quality of buildings they were buying or renting, however it seems that this pretext is not providing the desired results and the government is therefore looking for ways to better enforce the certification system.

The main challenges and future developments of the certification system for the short and medium term are, thus:

- > Introduce new legislation to enforce the certification system.
- > Continued improvement of the EPC Web Portal, including online audit reports, data entry validation and automation of the QA process.
- > Reinforce the QA Scheme, increasing the number of input checks.
- > Provide additional training for qualified experts on HVAC, DHW and renewable energy systems, as well as more effective auditing techniques.
- > Take immediate steps to prepare new building regulations in line with the requirements of the new recast EPBD.
- > Change from elemental requirements to maximum allowable energy footprints for the different building categories.
- > Carry out more studies and gather more data on EPBD implementation in order to make the general public more aware of the benefits that can be derived out of the EPC schemes.

Malta is acquiring experience through the EPBD implementation and will use it to achieve the final goal of new nearly zero-energy buildings by 2020.

*This report is funded by the Community's
Intelligent Energy Europe programme
under the contract IEE/CA/07/333*



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