08/2015 NEARLY-ZERO ENERGY BUILDINGS PLAN FOR MALTA

BUILDING REGULATION OFFICE

MINISTRY FOR TRANSPORT AND INFRASTRUCTURE

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Building Regulation Office
Ministry for Transport and Infrastructure
Malta

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JOE MIZZI /

Minister for Transport and Infrastructure

When in March 2013, the Hon. Prime Minister endowed me with the responsibility of the portfolio for Transport and Infrastructure, within the latter I had to take up the responsibility for the building industry. Within this ambit, a very important element is the Building Regulation Office (BRO) which was established through an Act of Parliament towards the end of 2011 but unfortunately not much was done within its area specifically when it comes to Energy Performance of Buildings.

In this regard, the Ministry ensured that the adequate capacity building exercise be taken in hand by putting in place an organisation structure that can bear results. In tandem, one had to identify which subsidiary legislation was in place but not functioning or obligations emanating from same which were never given due attention. All efforts were put in motion to obtain results and to deliver particularly through what was required under Legal Notice 376/2012 which transposed the EU Directive 2010/31 on the Energy Performance of Buildings.

Our Legal Notice under Clause 10 (1) provides that by 31st December 2020 all new buildings are nearly zero-energy buildings and new buildings occupied and owned by public authorities are nearly zero-energy buildings by 31st December 2018.

The roadmap has been laid. The Building Regulation Office produced this document which will serve as a basis for the widest possible consultation in the Maltese Islands on a theme that is gaining ground all over Europe and within which Malta too will perform well.

This Ministry thus together with the Building Regulation Office invites the public at large to give its feedback. We look forward to hear from all and sundry. We are more than ready to listen to one's concerns and opinions.

MICHAEL FERRY /

Head, Building Regulation Office

The National Plan to promote Nearly Zero-Energy Buildings outlines the Maltese strategy and actions necessary for achieving nearly zero-energy buildings after the end of 2018 for buildings occupied by public authorities and by the end of 2020 for all buildings respectively.

The Building Regulation Office through the Building Regulation Act was entrusted to ensure that this National plan be drawn up accordingly. A working committee made up of various stakeholders contributed towards mapping the way forward to increase the number of such buildings in the Maltese Islands. In parallel, a close look at what is happening on the European continent was a must not only to follow best practise but to identify a professional way ahead which would show that even though Malta is the smallest Member State within the European Union it was not ready to leave any stone unturned but to go for what works, is pragmatic and reasonable.

As an Office, we welcome any contributions towards the strengthening of this National Nearly Zero-Energy Buildings (NZEB) Plan and in this regard invite readers to send us an e-mail on bro.mti@gov.mt or call us on 22927134 if one would want to hold a meeting with us to discuss further or air any opinions or views.

EXECUTIVE SUMMARY

The objective of the National Nearly Zero-Energy Buildings (NZEB) Plan is to map a way on how to increase the number of such buildings in Malta.

As defined in Directive 2010/31, transposed locally by LN 376 of 2012, "nearly zero-energy building means a building that has a very high energy performance, as determined in accordance with Schedule I. The nearly zero or very low amount of energy required shall be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby."

Malta has a limited range of renewables which may be of use. The most obvious, especially for buildings, is solar-based renewables (mostly photo-voltaic and thermal). However, due to shading and limited access to roofs, this cannot be applied across the board. On the other hand, scarcity of land militates against communal PV farms. Due to this scenario, the definitions of NZEB have been developed with two components: a basic mandatory component which is mostly due to the building fabric and efficient building services; and a component of solar-based RES to be applied whenever possible. The two components would reach a mean figure of 75kWhr/m2yr for dwellings and 220kWh/m2yr for other buildings.

The proportion of energy consumed by buildings is the lowest in Europe, with consumption for households in 2013 generating 17% of total carbon emissions . This equate to around half of the EU28 average. Only a portion of the energy consumed by households is used for space conditioning lighting and hot water, with the larger proportion relating to plug-in loads.

The plan highlights the low level of forecasted new buildings and re-developed sites till 2020. The figures are 13,000 for dwellings and 518,500 m2 for market service buildings. A trajectory in reaching the 2020 and 2018 targets, including the intermediate targets has been proposed.

Some focus has been made on Government-owned and occupied buildings. These are normally quite heavy consumers and it is meant to launch specific initiatives so that they can serve as role models for the private sector.

Consultations indicate that one of the main barriers identified is the low level of skills related to energy efficient buildings by the present workforce; it is being proposed that the Roadmap identified in the Build Up Skills project be implemented.

INTRODUCTION

The National Plan to promote Nearly Zero-Energy Buildings outlines the Maltese strategy and actions necessary for achieving nearly zero-energy buildings after the end of 2018 for buildings occupied by public authorities, and by the end of 2020 for all buildings respectively. Intermediate targets have also been set as required by Directive 2010/31/EU

It specifically addresses the consequences of the recast EPBD for new buildings and the accompanying stricter requirement for energy performance (to be reduce to nearly zero), and its relation to the methods used to calculate the Energy Performance of Buildings (Energy Performance Rating of Dwellings in Malta (EPRDM) and Simplified Building Energy Model for Malta (SBEMmt), which are the two methodologies established in Malta as per Annex I of Dir 2010/31).

It also covers the policy and measures regarding transformation of existing buildings that are renovated to become nearly zero-energy buildings.

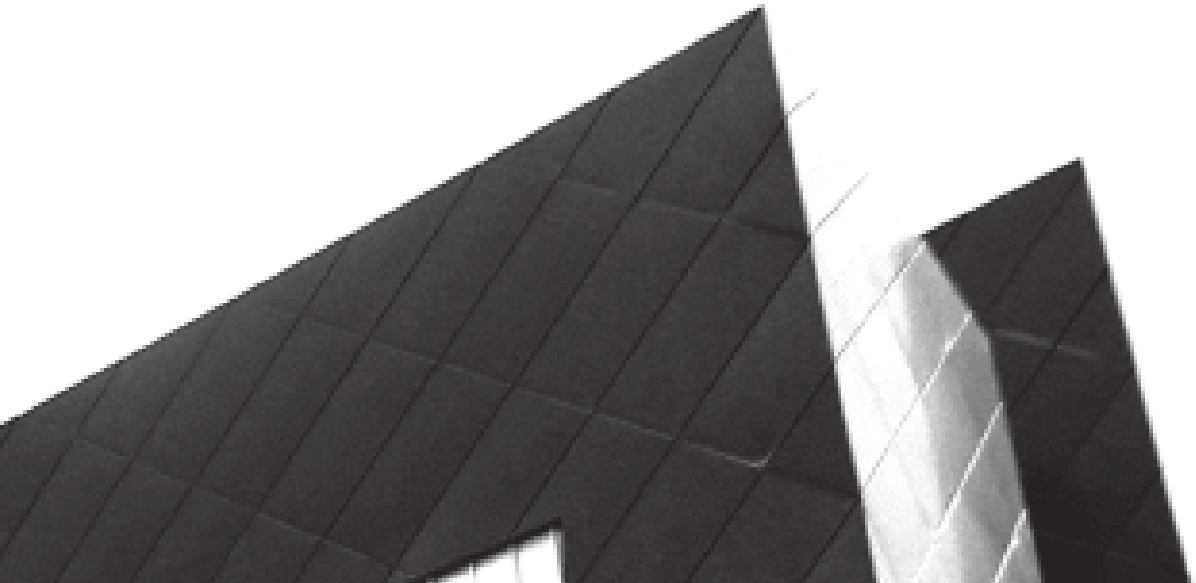
Article 9 of the recast EPBD states that the National Plan must contain the following information:

01 A definition of nearly zero-energy buildings, reflecting their national, regional or local conditions and including a numerical indicator of primary energy use expressed in kWh/m2 per year.

02 Intermediate targets for improving the energy performance of new buildings, by 2015, with a view to the goals for nearly zero-energy buildings in 2018 and 2020 respectively.

03 The policy being developed and the measures being adopted, such as setting targets to promote the transformation of existing buildings renovated to become nearly zero-energy buildings.

04 Information on the policies and financial or other measures for the promotion of nearly zero-energy buildings, including details of national requirements and measures concerning the use of energy from renewable sources in new buildings and existing buildings undergoing major renovation in the context of Article 13(4) of Directive 2009/28/EC (on renewable energy) and Articles 6 and 7 of this Directive.



01

THE BUILDING INDUSTRY IN MALTA

01.1
OVERVIEW OF THE BUILDING STOCK

Malta has a long history, and buildings may be found from various periods. However, significant population growth occurred only from the 17th century onwards. Buildings from the Knights Hospitalier period (1530-1798) are not uncommon, in most cases built in an inverted fashion around a central courtyard. Many of these are in use by the public authorities as offices, museums, cultural centres and so on.

According to the National Statistics Office, houses built during the British colonial period (1800-1964) are more common, constituting 39% of current stock. Sanitary laws of 1887 introduced a system of terraced housing, similar to the British system. This system was eventually adopted by planning regulations throughout the 20th century. It is now prevalent in low-rise and medium-rise housing.

Tourism growth in the 1960's together with rapid economic growth led the construction industry to embark on sustained construction development. The 70's and 80's saw construction of a large number of separate housing units (62% of those built), primarily due to affordable sale of development plots to families by government as a social measure. These housing units are mostly terraced houses with typical floor areas in the range of 150-250 square metres. Although these buildings typically have a high thermal mass and have cavity external walls, they are typically un-insulated.

By the 1990's construction had shifted to more sustainable multi-dwelling buildings (65% of total built) due to limited developable land. The trend towards flatted dwellings increased further with 2,635 out of 2,973 residential units granted a development permit in 2014 being flats or maisonettes (flatted dwellings with own private entrance).

In the early 2000's the country was going through a construction boom. This was due to the housing sector being viewed as a secure investment, with a holiday and retirement foreign market as a main demand driver the boom coincided with the repatriation of Maltese capital from abroad due to tax incentives present. According to the Malta Environment and Planning Authority, this boom had largely subsided by 2011, with the number of development permits of 11,400 units in 2007 going down to 2,700 units in 2013.

This occurred when prospective buyers realised that house prices may not rise fast any more, may stabilize and may even decline, and therefore investing in real estate might not be a good secure investment anymore.

TYPE OF DWELLINGS

Terraced house/ Townhouse	53,116
Semi-detached house	5,881
Fully-detached house	3,425
Maisonette/ Ground floor tenement	44,307
Flat/ Apartment/ Penthouse	44,275
Semi-detached farmhouse	589
Semi-detached farmhouse	731
Suite of rooms forming part of a housing unit	200
Garage	271
Other	183
Homeless	2
Total	**152,980**

Source: 2011 Census

Maltese housing has a chronic problem of high vacancy levels. The country is in the process of addressing this issue; a focus on re-development is gathering more and more momentum.

In 2011 Malta had 223,848 dwellings, out of which 152,978 (68%) were occupied. Traditionally in Malta, housing design falls into three broad categories, flats and maisonettes (representing 59% of the dwelling stock), terraced houses (representing 35% of the dwelling stock) and semi-detached/detached villas/ bungalows (representing 6% of the dwelling stock). Only 5% of dwellings were constructed after the introduction of the Technical Guidance: Minimum Requirement for Energy Performance in Buildings in 2006, while the majority of dwellings (56%) being constructed between 1971 and 2005. 19% of dwellings were built prior to 1945 whilst another 19% of dwellings were built between 1946 and 1970.

AGE OF OCCUPIED DWELLINGS	
1918 or earlier	15,809
1919-1945	13,382
1946-1960	15,641
1961-1970	13,903
1971-1980	22,754
1981-1990	29,234
1991-2000	23,399
2001-2005	10,594
2006 or later	271
Total	**8,262**

Source: 2011 Census

STATE OF REPAIR OF OCCUPIED DWELLINGS	
Good state	114,074
Needs minor repairs	29,319
Needs moderate repairs	6,826
Needs serious repairs	2,611
Dilapidated	148
Total	**152,978**

Source: 2011 Census

According to the 2011 census figures, 52% of dwellings are air-conditioned, but only 1.5% have a central heating system installed. 11% of dwellings have installed insulation. Whilst in 2011 11% of dwellings had solar water heaters, 8% of households had benefited for PV system schemes by 2014. The state of repair of the occupied dwellings is indicated in the table above.

Other relevant data is that there were a total of 193 licensed hotels and guest houses in 2013, a total of 850 manufacturing units in the main industrial estates in 2012, seven hospitals in 2013, and 324 schools in 2012.

01.2
CONSTRUCTION METHODOLOGY

Construction in Malta is still largely characterised by the use of the locally extracted globigerina limestone.

Until the introduction of concrete in post World War II, constructions were mainly made of load bearing walls of globigerina limestone, roofed over with thin stone slabs and waterproofed by means of a traditional mortar mixture made of lime, and ground pottery.

The wide-use of concrete in the 60's led to reinforced concrete roofs as well as to prefabricated pre-stressed roofing elements and building blocks becoming the norm.

By the 1980's the greatest barrier to development was the scarcity and cost of building space, which led to thinner walls and lower ceilings. Given Malta's mild climate, energy performance of buildings was not a major parameter in the design of buildings, since buildings were still low energy consumers.

This situation was largely addressed by the introduction of the Technical Guide F of elements.

01.3
DEVELOPMENT PERMITS TRENDS 2003 TO 2013

The figures quoted in this section are taken from data of the Malta Environment and Planning Authority, which is Malta's sole authority in issuing permits for development.

1.3.1
DWELLINGS

The table below shows the number of dwelling permits issued and the number of units permitted to be built during the period 2003 to 2013.

	DEVELOPMENT PERMITS FOR DWELLINGS			NUMBER OF UNITS				
	New Dwellings	Minor Works	**Total**	Apartments	Maisonettes	Terraced Houses	Others	**Total**
2003	1,321	517	**1,838**	4,548	1,085	414	81	**6,128**
2004	1,378	435	**1,813**	5,265	966	353	123	**6,707**
2005	1,852	570	**2,422**	7,539	1,058	363	121	**9,081**
2006	2,502	492	**2,994**	8,961	932	375	141	**10,409**
2007	2,636	411	**3,047**	10,252	696	257	138	**11,343**
2008	1,770	375	**2,145**	6,184	361	164	127	**6,836**
2009	1,241	368	**1,609**	4,616	400	182	100	**5,298**
2010	1,499	1,020	**2,519**	3,736	375	227	106	**4,444**
2011	1,159	832	**1,991**	3,276	401	191	87	**3,955**
2012	958	700	**1,658**	2,489	298	202	75	**3,054**
2013	1,004	808	**1,812**	2,062	350	209	84	**2,705**
2014	1,074	971	**2,045**	2,221	414	204	98	**2,937**

It is clearly seen that the boom of 2005-2007 has subsided, with the sector clearly showing signs of a contraction phase, and possibly in an oversupply situation. In particular, the number of maisonettes and terraced houses in 2011 show a sharp decline.

1.3.2 NON-RESIDENTIAL BUILDINGS

The following data relating to applications for new non-residential buildings between 1999 and 2005 provides an indication of the main non-residential building typologies and indicates that the main category is manufacturing, offices, retail and restaurants.

APPLICATIONS FOR NEW NON-RESIDENTIAL BUILDINGS

	Agriculture	Manufacturing	Warehousing, retail & offices	Hotels & tourism	Restaurants and Bars	Social	Parking	**Total**
2003	242	26	181	15	24	91	134	**713**
2004	261	31	192	8	25	49	105	**671**
2005	293	33	217	16	25	43	103	**730**
2006	267	38	169	9	26	30	84	**623**
2007	325	27	185	8	14	30	60	**649**
2008	182	29	137	6	14	8	66	**442**
2009	160	31	123	6	20	23	47	**410**
2010	293	55	231	10	46	118	79	**832**
2011	192	33	256	4	47	74	49	**655**
2012	169	33	247	17	32	87	58	**643**
2013	123	33	266	15	49	43	47	**576**

Commercial, social and other sectors seem to be more resilient than the residential sector. Overall reduction in total applications for the period 2003 to 2013 is 137. Warehousing, retail and offices actually increased during the period and restaurants/bars increased as well, perhaps reflecting the expanding tourism industry.

1.3.3
BUILDINGS OCCUPIED BY PUBLIC AUTHORITIES

The approach for buildings other than dwellings in the public sector will be the same as that for all buildings other than dwellings as described above. Public sector buildings will lead by example by achieving their defined nearly zero energy standard two years in advance of the private sector. The NZEB standard will be developed in advance of 2018 in order for the public sector to adopt it.

Effective energy efficient design strategies are already incorporated in all public sector projects at the early design stage, so that energy efficiency and other environmental measures are incorporated into the project from inception. Passive design strategies are incorporated and prioritised in all new building projects and, where practical, in existing building projects.

This will support the realisation of specific targets, e.g. achieving the desired Building Energy Rating (BER) in the most efficient manner.

The procurement procedures for consultants, including architectural and engineering design services, should include both qualitative and quantitative assessment criteria and demonstration of consultants' environmental design experience and/or qualifications. The assessment criteria will be proportionate to the nature, size and complexity of the project.

All buildings will be designed and constructed to comply with all Parts of the Building Regulations.

In addition, public bodies are required to fulfil an exemplary role (in the context of Directive 2009/28/EC on the promotion of the use of energy from renewable sources) when constructing or renovating public buildings.

Reusing existing buildings is, subject to positive environmental outcomes, given priority over new-build construction. Available best practice will be utilised in respect of refurbishment projects

In addition, the Restoration Directorate of the Ministry of Justice, Culture and Local Government has developed best practice in relation to: treatment of historic buildings, retrofitting of services and recommended strategic approaches. The traditionally constructed solid masonry walled buildings which comprise a majority of the country's historic building stock require specialist attention and advice to avoid damage in the attainment of particular Building Energy Ratings not only to their architectural and historical interest, but also to their fabric. However, their energy performance can be enhanced in many simple, cost effective ways and the upgrading and reuse of such buildings by public bodies will be considered in tandem with new construction.

Green procurement provides a framework that allows the Maltese public sector to play a consistent and exemplary role across its entire procurement profile. This will be an important element in driving the energy efficiency agenda in the wider context of climate change and energy policy.

In the context of schools, the national Foundation for Tomorrow's Schools has been at the forefront of design with respect to sustainable energy efficiency in school buildings. The primary school in Pembroke in 2009 was a new build project designed as the first energy self-sufficient school in Malta, relying solely on solar and wind energy produced on site for electricity and hot water. The lessons learned from the design and construction of this school are being implemented in other new schools and refurbishment projects carried out by the Foundation for Tomorrow's Schools.

01.4
ENERGY PERFORMANCE OF BUILDINGS

The figures quoted in this section are taken from data of the Malta Environment and Planning Authority, which is Malta's sole authority in issuing permits for development.

1.4.1
WEATHER CONDITIONS IN MALTA

The Maltese archipelago, with its two inhabited islands, Malta and Gozo, is situated in the Mediterranean Sea at 35 50 N and 14 30 E. The climate is mild, with wet cool winters and dry hot summers, and with diurnal thermal excursions being tempered by the surrounding sea. The Koppen-Geiger Classification for the Maltese islands is Csa and the climate is similar to that of adjacent regions such as Sicily and coastal Tunisia.

This climate has largely contributed to Maltese buildings being low consumers when compared to other European countries. The final household energy consumption per person was around a third of the EU 27 in 2007 . A portion of this energy is used for appliances, cooking and other plug-in loads, that have energy consumption which is not directly related to the design of a building.

AVERAGE OUTDOOR TEMPERATURE PER MONTH oC

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12.2	12.4	13.4	15.5	19.1	23.0	25.9	26.3	24.1	20.7	17.0	13.8

1.4.2
TYPICAL ENERGY CONSUMPTION IN HOUSEHOLDS

The only energy grid in Malta is for the supply of electrical energy and this accounts for approximately 80% of the energy supply to Maltese dwellings. A system for the national distribution of LPG in cylinders is used for the supply of gas for heating and cooking.

1.4.3
DWELLINGS

Maltese dwellings are in the vast majority of cases built in stone and concrete masonry, with cast in-situ concrete slabs. The high thermal mass of the buildings helps in mitigating the effects of high and low temperature peaks, however night cooling during summer is not possible since night temperatures remain at 23-24ºC during July and August. Given the southern Mediterranean position of Malta, space conditioning energy demand in dwellings is characterised by both a heating load and a cooling load. Statistics show that 58% of occupied dwellings are fitted with air-conditioning equipment, while less than 2% have a central heating system.

The dwellings tend to be heated and cooled intermittently with the occupants conditioning the parts being utilised only.

Small portable heaters are used for this purpose with typical energy carriers being LPG and direct electricity. The occupants use adaptive methods to achieve comfort levels such as higher clothing levels. Due to this behavioural pattern energy use is consequently low with recent studies indicating a daily delivered consumption of 11kWh per household for all uses. This behavioural pattern has only been partly reflected in the National Calculation Methodology for dwellings. In the latter full comfort levels were assumed albeit for specific time periods and floor areas.

Energy use calculations according to the National Calculation Methodology for the current building stock and the buildings currently being built have energy consumption figures higher than actual usage. Samples studies (BRO, dwellings, 2013) have shown that the average delivered energy demand for Space conditioning, hot water, lighting and ventilation in a typical existing buildings is 59kWh/m2yr. The respective value for the delivered energy demand in typical new dwellings is 28kWh/m2yr. This energy demand is higher than the actual measured energy use.

Cost-optimal studies: New Dwellings.

Studies to determine the Cost-optimal levels for new buildings have shown that where the installation of solar based renewable sources is possible, these prove to be cost-effective. The energy contribution for these renewable sources depends on the area of roof available and height of building.

The urban typology consists of terracing, where buildings lie adjacent to each other. Varying building heights together with sloping landscapes severely reduces or eliminates the solar potential for many buildings. Ownership law defines ownership of land as anything above or under a parcel of land, making third party rights to the availability of sun inadmissible.

Therefore although solar renewable sources have been explored in the cost-optimal studies, these have not been considered as the final cost-optimal levels. Such studies have also shown that insulation of the building fabric has limited effects on the energy demand. Insulation of the roof had positive effects both in summer and winter, while the benefits reaped from glazing and wall insulation is limited to the heating period. With further insulation and improvement of the building fabric, the already short heating season is reduced further and therefore the benefits tend not to make financial sense. Improving the efficiency of the air-conditioning systems such as using inverter type heat pumps has been shown to be cost-optimal, invariably across all cases. Analysis of the cost-optimality report for residential buildings in Malta has shown that the cost-optimal level lies around 85kWh/m2yr. The cost-optimal reference buildings have been found to have an improved building envelope, energy efficient lighting and improved space conditioning efficiency.

COMPARISON BETWEEN ENERGY DEMAND OF BUILDING TYPOLOGIES BUILT ACCORDING TO CURRENT MINIMUM REQUIREMENTS AND COST-OPTIMAL LEVELS FOR RESIDENTIAL BUILDINGS

Reference building	Building according to Current minimum requirements* (kWh/m2yr)	Cost-optimal level without Solar Renewable sources (kWh/m2yr)	Gap between current req. & cost opt. level without solar renew. (kWh/m2yr)	Difference %
Detached Villa	94	68	26	28
Semi-Detached Villa	84	64	20	24
Terraced house	82	63	19	23
Top floor maisonette	97	102	-5	-5
Ground floor maisonette	127	115	12	9
Top floor flat	125	92	33	26
Mid-floor flat	117	84	33	28
Average	**103.7**	**84.2**	**19.7**	**19**

The gap between current minimum requirements and the cost-optimal levels was found to be around 20kWh/m2yr. Solar renewable sources were not included for the purpose of calculating the gap since not all buildings have the ability to integrate these technologies. For comparison purposes, existing building stock built prior to the introduction of the first minimum energy requirements in 2007 has an average primary energy demand of 199kWh/m2yr. If renovated according to the current minimum requirements this demand will go down to 110kWh/m2yr. These studies have therefore shown that existing dwelling typologies have a higher calculated energy demand than new building typologies given the same building envelope characteristics.

1.4.4
NON-DWELLINGS

In the local context, the construction of non-dwellings on a large scale took off relatively late. The Maltese economy started diversifying from an agricultural and military base into a mixed economy from around the late 1960s. The majority of buildings used for non-residential purposes are therefore not very old. An exception to this are offices used by the government, where buildings built by the Knights of Malta in the 16th to 18th Century provide the backbone for the building stock used by the central government. These have been shown to be energy efficient and are not subject to the same energy regulations.

A recent report for actual building energy use shows that around 23% of buildings used by public authorities and exceeding 250m2 have a measured primary energy consumption exceeding 369kWh/m2yr. The major energy carrier for this is electricity since space conditioning is carried invariably by electrical heat pumps. High energy users in the non-dwellings sector tend to have short heating seasons and long-cooling seasons due to inherently high internal heat gains.

Studies for Cost-optimal levels have shown that there is a gap between current minimum requirements and cost-optimal levels. For office building typologies built according to current minimum requirements, the mean primary energy demand was found to be around 357kWh/m2yr. Solar renewable sources were shown to have a significant effect on results. Since as described previously not all buildings have the ability to introduce such sources, these were not considered for the purposes of estimating the gap. Excluding both Solar Thermal and Photovoltaic systems the cost-optimal level was found to be around 290kWh/m2yr, with a gap of 19% when compared to current minimum requirements.

Insulating buildings further was found to have little effect on the cooling load. Given the high internal loads inherent in Offices, and indeed in most non-residential buildings, the energy related measures available for reducing the energy use are therefore mostly limited to improving building systems rather than the building envelope.

PRIMARY ENERGY PERFORMANCE VALUES FOR NON-DWELLING REFERENCE BUILDINGS

Reference building	Current Requirements (kWh/m2yr)	Cost-optimal level without Photovoltaic systems (kWh/m2yr)	Gap between current req. & cost opt. w/o PV systems kWh/m2yr	Gap %
Detached Office <250m2	372.9	269.8	103.2	28%
Detached Office 250m2–1500 m2	279.8	215.7	64.1	23%
Detached Office >1500m2	338.65	199.1	139.6	41%
Terraced Office <250m2	419.8	305.7	114.1	27%
Terraced Office 250m2 – 1500 m2	378.1	290.9	87.2	23%
Terraced Office >1500m2	352.1	280.2	71.9	20%
Mixed Use Office <250m2	382.1	288.6	93.4	24%
Mixed Use Office 250m2 – 1500 m2	367.4	203.5	163.8	45%
Mixed Use Office >1500m2	318.1	248.3	69.7	22%
Average	**356.5**	**255.7**	**100.7**	**28%**

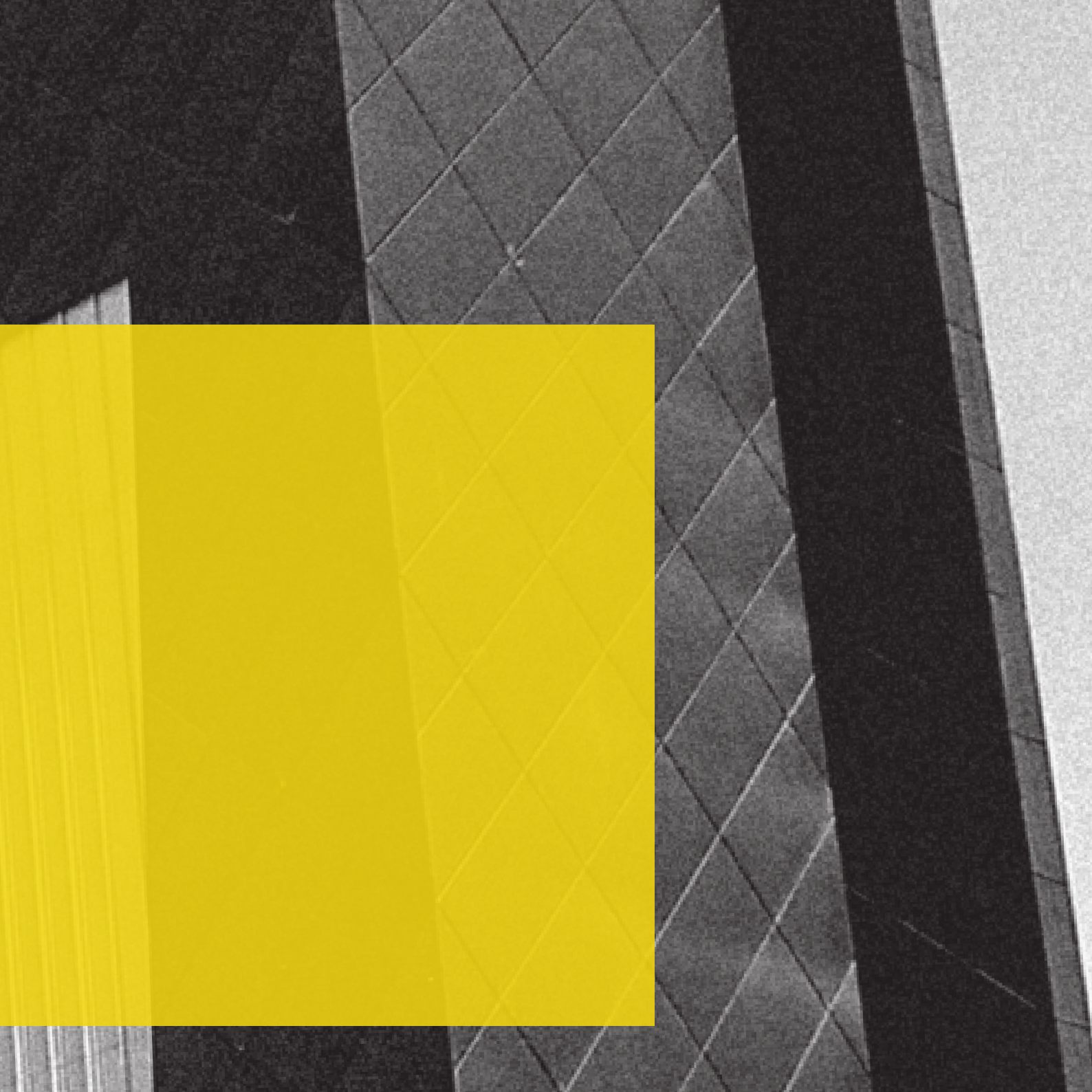
1.4.5
OUTLOOK FOR THE FUTURE

Energy generation is currently undergoing radical transformation in Malta, with a new power station in 2012, an electrical interconnector which started operation in March 2015. A new power generation unit is currently under construction. This will further improve the overall generation efficiency and will operate on natural gas, thus reducing carbon emission intensity considerably. This major overhaul of Malta's generation capacity led to a reduction in energy tariffs. Such radical changes have increased and will continue to increase efficiency is expected to increase reducing generation costs and putting downside pressure on energy rates. Since reduced energy tariffs apply an upward effect on cost-optimal levels, the gap between current minimum requirements and cost-optimal levels will be partially mitigated.

In all studies carried to date, energy demand values for buildings built according to current minimum requirements are based on the use of relatively inefficient heat pumps, having a coefficient of performance ratio between 3.0 and 3.2 as per Legal Notice 27/2003, Schedule VIII Table 1.1. The efficiency of heat pumps traded and installed within the European Union is controlled according to separate directives, UE206/2012 and UE626/2011. Thus any heat pumps in new buildings will have minimum seasonal coefficients of performance of 3.8/4.6 for heating/cooling. Space conditioning is therefore expected to be reduced further, having an effect on cost-optimal levels and mitigating the existing gap.

02

ESTIMATION OF DEMAND FOR BUILDINGS (NEW) FOR PERIOD UP TO 2020



The figures quoted in this section are taken from the Strategic Plan for the Environment and Development being discussed in the Parliamentary Committee for the Environment compiled by the Malta Environment and Planning Authority. In the 2002 Housing Topic Paper it was estimated that Malta would need an additional 43,000 housing units for the period 2000 to 2020.

Out of these, 13,000 units are expected to be built during period 2014 to 2020. Based on figures for years 2002 to 2012, 6,240 will be built on vacant land whilst the remainder, 6,760 will be re-developing already occupied land

Hence, assuming a constant rate of development, evenly distributed, the projected new build (on vacant land) and re-development is as follows:

PROJECTED NEW BUILD (ON VACANT LAND) AND RE-DEVELOPMENT

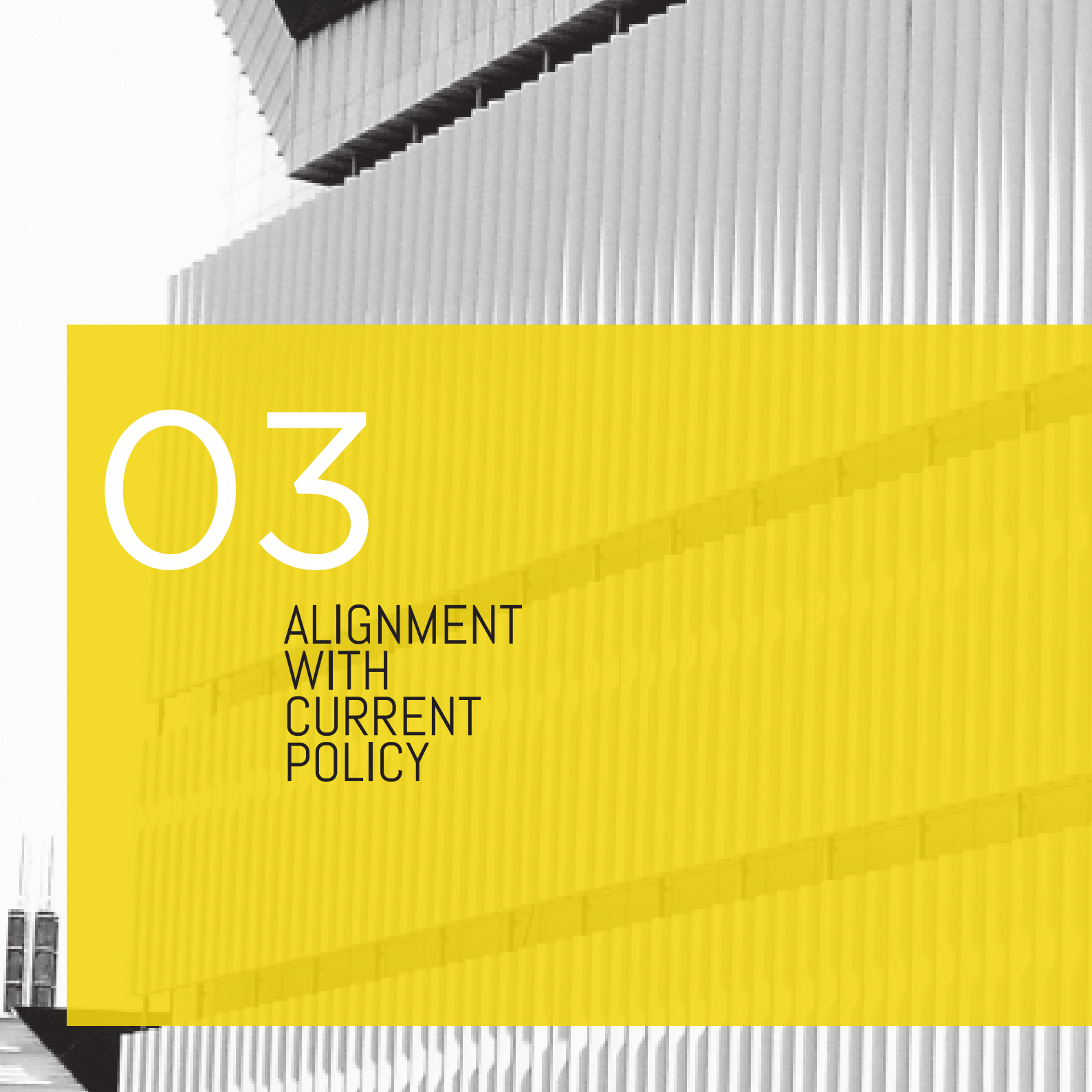
	2014	2015	2016	2017	2018	2019	2020	**Total**
New Build	890	890	890	890	890	890	900	6,240
Re-Development	940	940	940	940	940	940	940	6,760
Total	**1,830**	**1,830**	**1,830**	**1,830**	**1,830**	**1,830**	**1,840**	**13,000**

The Strategic Plan for the Environment and Development compiled by the Malta Environment and Planning Authority, indicates that 518,500 m2 of floor-space would be required for market services, based on the number of jobs to be created in this sector. This indicates that development in warehousing, retail and offices is likely to continue to increase and might need additional space allocation.

If these projections are spread out evenly over the 7 year period to end in 2020, then the number of floor space required would be as shown below.

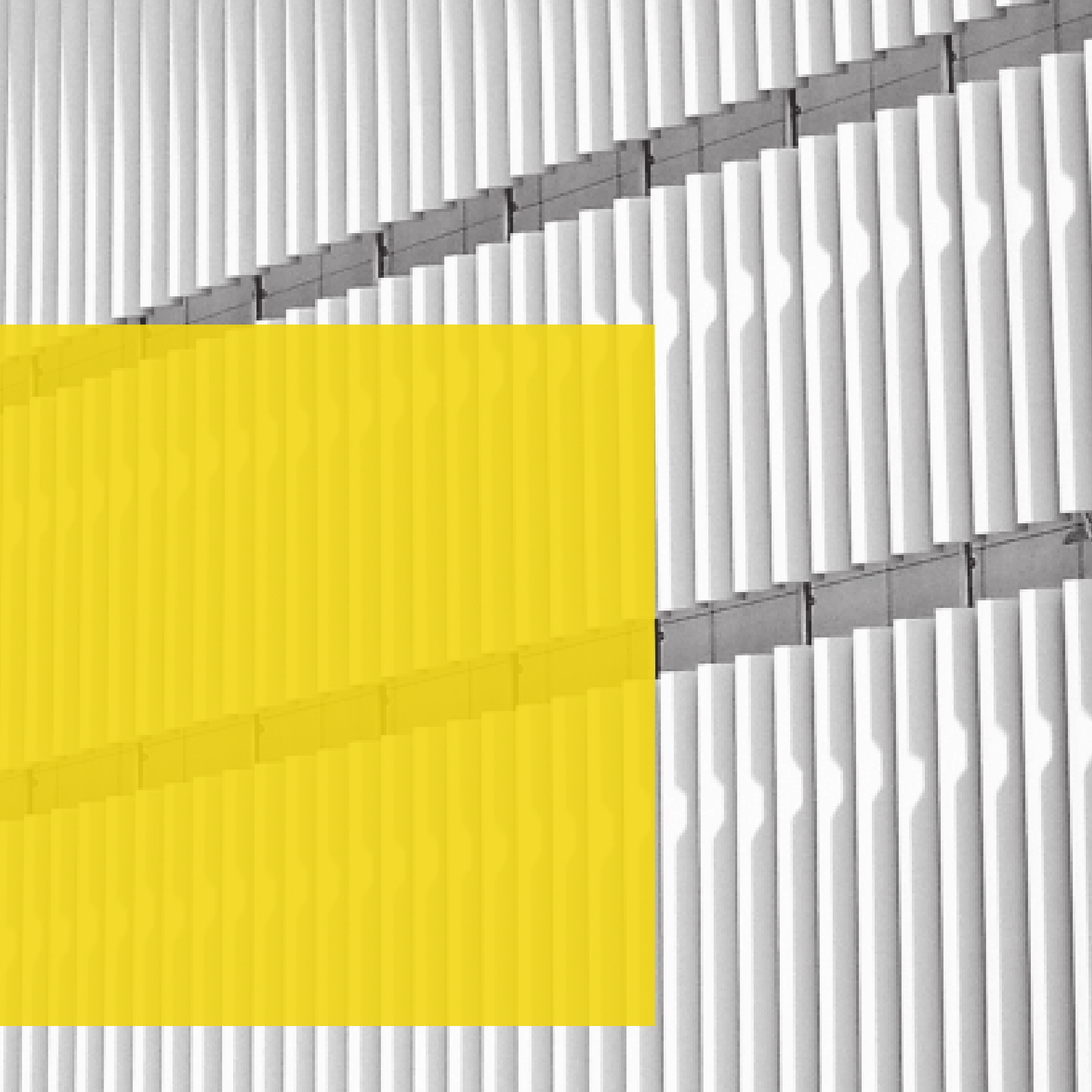
NUMBER OF FLOOR SPACE REQUIRED WHEN SPREAD OUT EVENLY OVER THE 7 YEAR PERIOD TO END IN 2020

	2014	2015	2016	2017	2018	2019	2020	**Total**
New Build + renovation (m^2)	74,070	74,070	74,070	74,070	74,070	74,070	74,070	**518,500**



03

ALIGNMENT WITH CURRENT POLICY



Since 2006, the Energy Performance Standards for residential and other buildings have been the basis for policies on energy conservation in buildings. Building regulations impose minimum requirements on the energy performance of buildings, promulgated through the Technical Guidance: Minimum Energy Performance Requirements – Doc F 2006.

The Document F adopts an element-based approach, with limits being set for the minimum performance of building elements such as roofs and external walls. It also sets limits on the percentage of glazed areas according to orientation; this reduces the solar overheating. There are no overall building performance figures set.

The following table gives an overview of the main standards set.

The current minimum requirements are presently being revised as an outcome of the studies to establish cost-optimal energy performance levels in accordance with Article 5 of the recast EPBD.

OVERVIEW OF THE MAIN STANDARDS

Building element	Standard	Source
External Wall	Maximum U = 1.57	Document F Table F.1
Exposed floors	Maximum U = 1.57	Document F Table F1 +diagram F1
Floor to ground	Maximum U = 1.97	Document F Table F1 +diagram F1
Roof	Maximum U = 0.59	Document F Table F1
Windows	Maximum U = 5.8 for a maximum 20% area of the exposed walls	Document F Table F.2
Roof lights	Maximum U = 5.8 for a maximum 10% area of the roof	Document F Table F.2
Glazed area to prevent solar overheating	Maximum allowable area of openings North 25%, South 20%, NE 17%, E/SE/SW/NW 12%, West 9% Horizontal 7%	Document F Table F.4
Heating	Reverse cycle air-to-air heat pump with C.O.P. of 3.2	Current minimum SCOP is 3.4 according to EU 206/2012 and 3.8 from the 1st January 2014
Cooling	Reverse cycle air-to-air heat pump with C.O.P. of 3.0	Current minimum SEER is 3.8 according to EU 206/2102 and 4.6 from the 1st January 2014
Domestic Hot Water	Electric storage water heater with 100% efficiency and 85% storage efficiency	Typical water heating for local housing
Lighting	100% Energy Efficient Lighting Limits on Lighting Controls	Tungsten incandescent lighting no longer available following EU 244/2009. Doc F, Table F.6

04

A DEFINITION OF NEARLY ZERO-ENERGY BUILDINGS

THE DEFINITION AS PER DIRECTIVE 2010/31/EU

"Nearly zero-energy building means a building that has a very high energy performance, as determined in accordance with Schedule I of LN376 of 2012. The nearly zero or very low amount of energy required shall be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby."

The NZEB Plan must include "the detailed application in practice of the Authority regarding the definition of nearly zero-energy buildings, reflecting the national conditions, and including a numerical indicator of primary energy use expressed in kWh/m2 per year. Primary energy factors used for the determination of the primary energy use may be based on national yearly average values and may take into account relevant European standards."

NZEB DEFINITION(S) FOR MALTA

Nearly zero-energy buildings have to be defined in accordance with the mild local climate, local building standards and the national energy infrastructure, whilst keeping in mind future developments. At this stage it is practical to include 2 definitions: one for dwellings' units and the other for non-dwellings. These definitions are being drawn up with the following caveats:

01 The Technical Guidance: Minimum Energy Performance Requirements for Buildings shall still follow a largely elemental/component approach, coupled with an overall performance figure.

02 The definitions refer to minimum energy performance levels, which can be reached by all buildings in Malta. This non-discriminatory approach between buildings having solar potential and those without is essential since it is not perceived that the issue of solar rights be solved in the near future. This will also avoid the situation where planning permissions may have to be denied due solely to lack of solar potential.

03 Performance beyond the minimum is possible but it will be on a voluntary basis, tied to a system of incentives.

04 As related issues get clearer and more defined, the definition may be reviewed in the next update to the NEEAP.

The following are for a formal definition.

A ‘nearly zero-energy building’ is a building with a very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site. The ‘energy performance of a building’ is the calculated amount of energy needed to meet the energy demand associated with a typical use of the building, which includes, inter alia, energy used for heating, cooling, ventilation, hot water and lighting. The energy performance of a building is defined by a numeric indicator of primary energy use, based on primary energy factors per energy carrier as defined in the national calculation methodology, which are based on national annual weighted averages and specific values for on-site production.

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The energy performance of nearly zero-energy buildings will be such that the primary energy balance will not exceed 220 kWh/m2yr, except for dwellings which shall have a higher energy performance. The primary energy balance requirement for dwellings shall be set according to building typology such that the renewable energy potential according to dwelling typology is taken into consideration.
The mean primary energy demand requirement for dwellings shall be 75 kWh/m2yr. Energy demands shall be calculated in accordance with the approved methodology and according to the following explanatory notes.

01 1. The metric for measurement is the primary energy demand of the building over a period of one year, using a numerical indicator for primary energy use measured in kWh/m2yr. The primary energy factors used for the determination of primary energy use are based on the national yearly average values as defined in the national calculation methodology.

02 The energy demands to be included in the calculation are space heating, space cooling, domestic hot water, ventilation, and lighting. This calculation is to be carried out on the basis of the national methodology which is currently differentiated between dwellings (EPRDM) and non-residential buildings (iSBEMmt).

03 Identical weighting factors for energy demand and energy generation are used. In other words the primary energy weighting factors for electricity generated on site, for example, are the same weighting factors used for electricity from the grid. This policy is subject to review over time. Weighting factors are neither dependent on the time of day nor seasonal.

04 When the building employs a device that is capable of transferring heat from natural surroundings from a lower to a higher temperature, such as a heat pump, the renewable portion is the difference between the primary non-renewable energy used to condition the space and the calculated primary energy used if the default device as indicated in the national calculation methodology is employed.

05 When a device which uses fuel from a renewable source is used for heating, cooling, ventilation, lighting or domestic hot water, the renewable portion will refer to the difference between the non-renewable primary energy used by that device and the calculated primary energy which would be used by the default device indicated in the national calculation methodology.

06 The reference area for calculation is the internal net floor area as defined by the respective methodologies, EPRDM for dwellings and iSBEMmt for non-residential buildings.

07 Where a building consists of multiple units of the same use and the energy use intensity is calculated for each unit in line with the national calculation methodology, the building as a whole may be deemed to fulfil nearly-zero energy requirements if the weighted mean primary energy intensity for the whole building does not exceed the primary energy use for that building typology.

08 The balance period for calculation is one year.

09 The comfort standards are defined by the respective methodologies EPRDM and iSBEMmt. Whilst these requirements do not specify an explicit specific value for the fraction of renewable energy, where there is potential for the use of solar renewable sources, data from the cost-optimal analysis indicate that alternative energy can typically contribute 25-50% for dwellings and up to 20% for non-residential buildings energy requirements.

10 The energy balance is calculated on the basis of imported and exported energy. There is no provision for the export of heat energy, which is not in use in Malta, but only electrical energy.

11 In accordance with longstanding policies for the conservation of rainwater at source, where such water is stored and re-used on site, a renewable portion shall apply which is equal to the primary energy used to supply the equivalent volume of water to the end-use location, as defined in the national calculation methodology.

12 There is no requirement in the definition for load matching and grid interaction, although this will be reconsidered when the definition is revised.

13 The values indicated in point 9 are guidelines for the fraction of renewable energy but are not definitive requirements. Should requirements be introduced when this definition is revised it could be necessary to distinguish between renewable heat energy (from heat pumps and solar thermal) and renewable electrical energy.

14 No requirements in addition to those prescribed by the national minimum requirements for energy apply with regards to particular building elements, such that the stricter requirements for nearly zero-energy buildings may be achieved through the adoption of any such design as deemed appropriate and effective by the building designer.

15 The definition does not include any form of weighting influenced with the intention of favouring specific technical solutions.

16 Where a building is not fitted with a fixed device for heating or cooling in specific areas or in its entirety, heating and cooling requirements for that area or the building as a whole, as the case may be, may be omitted from the calculation of primary energy use.

The definition may be expanded to take into consideration the following elements:

A A performance part and a prescriptive part on energy needs and energy use. Energy needs for heating, cooling, and hot water, and energy use for lighting and ventilation are based only on physical variables and the choice of thermal comfort set points and define the performance part. The prescriptive approach defines the minimum requirement for components such as the U-values for windows and walls, glazing parameters, air tightness, etc.

Domestic hot water use is dependent on occupant density in a building unit and specific values are more difficult to establish than for heating and cooling. With the reduced space heating and space cooling needs of nearly zero-energy housing, domestic hot water use becomes a significant component of the total home energy use, equalling or even exceeding the heating and cooling energy demand. In non-residential buildings the lighting load is equally significant and careful design of the envelope and the layout can maximise availability of daylight.

B In the long term the yearly primary energy balance might be developed to show monthly time intervals. The primary energy weighting factors take into account different sources' actual input to the grid.

C Requirements for nearly Zero Energy Residential Buildings may be differentiated according to building category such that it is possible to take into account the differing capabilities of the building to achieve very low-energy levels. In this regard, the lack of roof access for flatted dwellings is taken into account and different requirements are applied than those pertaining to Terraced houses, semi-detached buildings and fully detached Buildings.

REQUIREMENTS FOR NEARLY ZERO ENERGY RESIDENTIAL BUILDINGS

Building Category	Flatted Dwellings	Terraced Houses	Semi-detached Housing	Fully detached Housing	Mean Energy Requirement
nZEB Overall energy demand requirement	115kWh/m2yr	75kWh/m2yr	55kWh/m2yr	55kWh/m2yr	75kWh/m2yr
Renewable contribution requirement	yes	yes	yes	yes	

05

THE SOLAR POTENTIAL OF BUILDINGS IN MALTA

05.1
SOLAR POTENTIAL FOR MALTA

Peak radiation occurs in summer and reaches a maximum of almost 8 kWh/m^2/day, while in winter it drops to a minimum of 2.5 kWh/m^2/day. This data compares favourably with other sites around the Mediterranean region and southern Europe (Palz 1984, Yousif 2005).

The table below shows that for more than 62 % of the year Malta enjoys an abundance of sunshine, while only 11 days (3%) may be considered as very cloudy days.

YEARLY PERCENTAGE OF SUNSHINE HOURS IN MALTA

Sky Description	Range (Clearness Index)	Occurrence (%)
Cloudy	G/H0 <0.2	2.9
Partly Cloudy	0.2<G/H0>0.6	34.5
Clear	0.6<G/H0<0.75	61.9
Very Clear	G/H0>0.75	0.7

Source: 2011 Census

05.2
PRACTICAL PERFORMANCE IN MALTA OF SOLAR PHOTOVOLTAIC (PV) SYSTEMS

Data for typical stationary grid-connected PV array, inclined at 30° to the horizontal and facing the true geographic South indicate an annual production of approximately 1500kWhr/kWp over the lifespan of the PV panel. This figure is attainable only if there are no shading problems.

05.3
POTENTIAL OF SOLAR RES ON INDIVIDUAL ROOFS OF BUILDINGS

The fact that Malta enjoys an abundance of sunshine and mild temperatures, coupled with other factors such as the existence of flat roofs as the standard way of building and the recent trend of increased power consumption in summer due to air conditioning, all favour the application of solar RES on a wide scale.

However, one must be aware of many limitations which preclude the installation of such equipment on all buildings.

First of all, not all residential units have the legal access to install such systems on the roof; many units being built today have access to roof but not ownership.

Secondly, there are no solar rights in Malta, with the traditional property right prevailing. Hence there is no guarantee that no shadows will be cast from neighbouring buildings. In the prevalent high density terraced townscapes shading by neighbouring buildings occurs often.

Thirdly, roofs in Malta are used for other purposes, including the drying of clothes. This is a very energy efficient measure since it reduces the use of electric tumble dryers. Satellite dishes, water storage tanks and television antennas are also installed on the roof.

It is essential to take into consideration the aesthetics of buildings, particularly in Urban Conservation Areas and other specific areas. Moreover, legislation stipulates that retrofits should be placed away from façades and the existence of 1 metre-high perimeter walls at roof level would further reduce the area available for solar RES.

05.4
POTENTIAL OF RES AS COMMUNAL OR "NEARBY" SYSTEMS.

Regarding communal and/or nearby systems, the only feasible option is felt to be photovoltaic farms. However this also has its limitations within the context of Malta's specificities.

In view of Malta's Commitments with regards to renewable energy sources and its limitations, PV installations are expected to increase to around 295GWh by 2020, requiring 2.7km2 of land. This is considered as a substantial expanse when compared to Malta's 317 km2 total area, with 33% developed and 41% arable land, among other uses. Industrial estates, quarries, disused landfills and car parks are being earmarked as suitable sites for ground mounted PVs. Once full potential of the identified sites is exhausted to meet 2020 targets, it is unlikely that further deployment of ground based PV systems would be sustainable.

06

POLICIES AND MEASURES

The following outlines the key activities critical to maintaining and advancing progress towards achieving nearly zero-energy status for Malta's buildings.

06.1
INCENTIVE SCHEMES AT PRESENT

NUMBER OF RES GRANTS

Grant	Number of Grants	Years
Installation of PV systems (6 Different grants on initial cost)	13,292	2006-2013
2012 Roof insulation / double glazing	1,236	2006,2009, 2012
Solar water heater/collectors	8,761	2006,2009,2010,2011-present

Other incentives including RES incentives

- Grant for energy efficient appliances (40,571 grants issued)
- Free distribution of energy efficient lamps to all households (2008-2009)
- Feed-in tariffs for PV systems in Domestic buildings (ongoing)
- Feed-in tariffs for PV systems in non-Domestic buildings (ongoing)
- Grant for second class water system (energy saving from RO plant)

The Building Regulation Document F (2006) already marks an important step on the road to nearly zero-energy and places Malta firmly in position to continue developing energy efficiency standards for new residential and non-residential buildings. This was the first step to achieve the 2020 performance levels and it is being developed further so as to introduce a nearly zero-energy building standard into legislation between 2015 and 2018.

DETAILS OF PRESENT AND PREVIOUS GRANTS

A scheme for wind energy systems was launched in 2006, but is no longer available. This consisted of a capital grant for the installation of wind turbines.

A scheme regarding CFL's (Compact Fluorescent Lamps) was launched in 2009 together with an extensive publicity campaign. This consisted in the of distribution of 3-10 free CFL's to households.

A Roof thermal Insulation scheme was first issued in 2008 and is still available. This consists of a capital grant of 15% up to a maximum of €233 per residential unit for the installation of roof insulation Double glazing scheme was issued in 2008 and is still available. This consists of a capital grant of 15% up to a maximum of €233 for every residential unit for the installation of roof insulation

Energy Efficient Domestic Appliances grant was issued in 2006 and is no longer available. This targeted the replacement of old inefficient appliances and consisted of a capital grant for the purchase of A class domestic appliances.

Capital Grants of Solar water heaters have been in place since 2008 and are still available to any owner wishing to apply. In 2012 more than 16,000 Solar water heaters had been installed (NSO, 2013). The schemes available were as follows:

- Solar Water Heaters 2008 (€460 capital grant)
- Solar Water Heaters 2009 (€460 capital grant)
- Solar Water Heaters 2010 (€460 capital grant)
- Solar Water Heaters, Solar Collectors ERDF 2011-present (€400 capital grant; €560 means tested)

Photovoltaic Panels: 50% grant on capital cost up to a maximum of €2500. A feed in tariff applied of €0.25/kWh for a period of 6 year. In lieu of capital grants feed in tariffs ranging from €0.155-0.18/kWh apply for a period of 20 years.

- Solar Photovoltaic Systems 2008
- Solar Photovoltaic Systems 2009
- Photovoltaic Systems 2010 Call1 (50% capital grant up to a max of €3000, FIT €0.25/kWh)
- Photovoltaic Systems 2010 Call2 (50% capital grant up to a max of €3000, FIT €0.25/kWh)
- Photovoltaic panels 2011 (50% capital grant up to a max of €3000, FIT €0.25/kWh)

Soft loans are available from all leading local banks. These consist of unsecured loans with low interest rates. The following are conditions of a typical loan: €50,000 max loan value, 3.85% interest rate, €20 processing fee, 8 year repayment period.

Local Banks Offering loans:

- APS Bank Ltd: EcoPlus – Finance for Renewable Energy Sources
- Banif Bank (Malta) plc : Green Energy Loan
- Bank of Valletta plc: BOV Eco Personal Loan
- HSBC Bank Malta plc: Green Loan

06.2
MAIN BUDGET 2014 MEASURES

CHEAPER AND GREENER ENERGY

One of the Government's key priorities is to provide cheaper and greener energy for all households. This will be achieved through the implementation of the following measures:

ENERGY EFFICIENCY SUPPORT

This measure is intended to give support to Maltese households in order to help them implement measures and applicable systems which would lead to a reduction in the energy use at home. Every family will be given the opportunity to have an energy audit, on a voluntary basis. The household would then be given advice on how to reduce consumption. This measure will lead to an increase in energy efficiency at home and to a reduction in energy use and CO2 emissions. In addition, it would also lead to lower energy expenditure.

SOLAR WATER HEATERS, DOUBLE GLAZING AND ROOF INSULATION SCHEMES

An incentive scheme will be adopted to help people upgrade their residence to one which is more energy efficient. This measure emanates from the National Energy Efficiency Action Plan and is in line with Directive 2012/27/EU. This measure will lead to a reduction in the domestic energy use which subsequently reduces the amount of CO2 emissions.

PILOT PROJECT AT SIGGIEWI PRIMARY SCHOOL

This initiative is a pilot project, proposed to take place at the Siġġiewi Primary School where the current equipment will be replaced with a more modern, energy efficient one. This will include amongst others insulation and smart lighting. Government has allocated funds for this proposed EU co-financed project. The implementation of this measure will increase the energy efficiency of the classrooms, leading to a significant reduction in CO2 emissions generated. Furthermore, students attending the Siġġiewi primary school will benefit from a more comfortable and suitable learning environment.

BUDGET DOCUMENT 2014

Studies for the National Energy Efficiency Action Plan - This measure will deal in particular with studies on energy efficiency that shall be used in the compilation of the National Energy Efficiency Action Plan. These studies will also be beneficial when transposing the Energy Efficiency Directive and the implementation of the specific obligations therein. Government has allocated funds for this proposed EU co-financed project. A sound energy efficiency plan based on studies and evidence will lead to a reduction in energy consumption and expenditure. It will also contribute to the reduction of CO2 emissions.

06.3
NEW SCHOOLS

The Government is allocating money on a three-year programme for the maintenance and upgrading of schools. Furthermore, Government is also allocating money for the building of five new schools. It is expected that these schools will be designed to high level of energy efficiency, as detailed above, by the Foundation for Tomorrow's Schools.

06.4
GREEN PROCUREMENT AND GREEN LEADERS

The Government has taken a lead role in procuring of services and goods generated and delivered in an energy efficient way. This is expected to generate a market for energy efficient products and services. The supply of such products and services may then be readily taken up in the private sector.

07

BARRIERS TO THE INTRODUCTION OF NZEB'S IN MALTA

The following were the main barriers identified during feedback sessions with some of the stakeholders.

01 Low level of skills of workforce, with very limited knowledge of energy efficiency related matters.

02 Lack of space for installation of RES

03 Lack of Solar Rights

04 Construction industry based on small and micro-enterprises, emanating from size of industry and insularity.

08

PROPOSED STRATEGY/POLICY AND TARGETS

08.1
INTERMEDIATE TARGETS

Malta is in the process of updating current minimum requirements. These requirements will be finalised in the near future and are expected to be into force for a few years prior to the requirements for nearly zero energy buildings become mandatory. Results from the cost-optimality studies indicate that these requirements will have additional requirements to the current minimum requirements but will not require nearly zero energy levels. Therefore such requirements will act as qualitative intermediate targets towards the post 2020 nearly-zero energy scenario.

TARGETS AND TRAJECTORY FOR NZEB DWELLINGS

	2014	2015	2016	2017	2018	2019	2020	**Total**
New Build	890	890	890	890	890	890	900	**6,240**
	0	10	20	30	60	80	100	
No of NZEB	0	89	178	267	534	712	900	**2,680**
Re-development	940	940	940	940	940	940	940	**6,760**
%	0	10	20	30	60	80	100	
No of NZEB	0	94	188	282	564	752	940	**2,820**

TARGETS AND TRAJECTORY FOR NZEB NON-RESIDENTIAL

	2014	2015	2016	2017	2018	2019	2020	**Total**
New build + renovation m2	74,070	74,070	74,070	74,070	74,070	74,070	74,070	**518,500**
%	0	10	20	30	60	80	100	
		7,407	14,814	22,221	44,442	59,256	74,070	**222,210**

Quantitative targets are being adopted to increase the number of nearly-zero energy buildings in the period prior to 2020. The levels for such targets are being set out in the tables above. Initiatives such as financial incentives, promotional campaigns and research projects are envisaged to assist in the progression towards the achievement of these targets.

ACTION PLAN

INFORMATION/ DISSEMINATION

Action	Description	Lead Entity
Promotion of uptake of RES and energy efficiency measures in the Domestic sector.	This measure aims to promote the uptake of solar water heaters and roof insulation and double glazing by issuing financial grants to households to encourage the purchase of new solar water heaters (maximum € 400 per system installed) and the purchase of roof insulation and double glazing (maximum € 1000 per dwelling). This measure has been ongoing over the period 2006-2015 and will be continued in the future, with a particular target towards those measures that enable buildings to reach NZEB levels.	MEH/MRA
Helpline	Manning of a help line (web based plus telephone) to assist general public and professionals in sector regarding matter concerning energy certification.	BRO
Information Centre	Information centre, mainly on-line, for the exchange of information concerning green products and services.	BICC

EDUCATION +TRAINING

Action	Description	Lead Entity
Technical capacity building in refurbishment techniques	Setting up of a unit, within the Office of the permanent secretary, Ministry for Transport and Infrastructure, to assist in the technical implementation of refurbishment projects for public-owned buildings.	MTI
Build up skills	Implementation of initiatives identified in Build Up Skills Roadmap	BICC
EPC assessors training	Continue training/updating Assessors in energy performance certification	BRO
Inspectors for heating and cooling systems	Continue training/updating Assessors in energy performance certification	BRO
Skill cards	Introduction of skill cards related to energy efficiency for employees	BICC

POLICY, LEGISLATION AND INFRASTRUCTURE

Action	Description	Lead Entity
Solar RES for Social Housing	Policy to facilitate the legal requirements in order to facilitate the installation of RES on the common areas of social housing	Housing Authority
Green Economy Action Plan	This will be developed in the period prior to the completion of the shift towards nearly zero energy buildings	MSDEC
National Environment Policy	This is particularly crucial to coordinate improvements between environmental policy for buildings and that for other environmental aspects	MSDEC

POLICY, LEGISLATION AND INFRASTRUCTURE

Action	Description	Lead Entity
Public Buildings	Issuing of specifications for Refurbishment to NZEB standard: Through the highest public service authorities, directions will be issued setting the minimum requirements to be met by public buildings undergoing major renovations. This will effectively serve as Minimum Requirements and will enable the Public Sector to assume its leading role.	BRO
RES Installation	Developing and introducing local codes regarding the predisposition of buildings to accept RES (solar water heaters and PV) installations. These include: Method to utilise weight of roof slab to hold down arrays of PV rather than having unnecessary ballast loaded on roof. Circulating plumbing system specifications in order to avoid loss of water due long length of pipes Integration of RES in the building envelope Updating of Planning Guidelines to lessen impact of RES on environment especially in ODZs and UCAs without hindering the installation of RES. Continue to monitor possibility of large RES farms in Malta Continue development of Minimum requirements for Malta Buildings as technologies develop	BRO
Public Buildings	Al least 5% of all projects will be to NZEB standard.	MFIN/MEH/ MTI

POLICY, LEGISLATION AND INFRASTRUCTURE

Action	Description	Lead Entity
Furthermore	Malta plans to compile an inventory of central government buildings as required by Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency.	BRB/ SEWCU/GPD
NZEB standards for public buildings	Development of specifications for government authorities for the construction, renovation and renting of building owned/occupied by public authorities	BRO
Guidelines for the building of NZEB Schools	The Foundation for Tomorrow's Schools has over the past years built a number of schools with performance optimisation for energy efficiency. It is planned to develop and issue a set of Guidelines based on these experiences.	FTS/BRO

RESEARCH

Action	Description	Lead Entity
Research and Development	Action Plan for R&D	MEDE/MCST
Research	Research in local building methods, funded through EU programmes and/or national funding. Areas such as: Improvement of thermal insulation of present building elements. Utilisation of sea water and/or shallow ground water for part space conditioning purposes. Absorption type air-conditioning using solar thermal processes	BRO
Demonstration Projects	The implementation of demonstration projects which bridge the gap between research and market application	BICC
Innovation Market research	On-going market research on building products to raise awareness about innovative solutions	BICC

FINANCIAL

Action	Description	Lead Entity
NZEB Fund	Fund to provide capital for the refurbishment/new built for NZEB, excluding govt-owned buildings.	MFIN/MTI
Feed in Tariffs for PVs not supported through other funding	National funds up to €5million	Ministry for Energy and Health
ERDF Scheme for the purchasing of PV panels for enterprises	An application is launched with Malta Enterprise for funds to be secured specifically for this purpose	MEIB/ME
New Scheme for PV Panel Installations in Households	Schemes will be launched similar to those on existing buildings, but with a particular emphasis to reach NZEB levels	MEH/MRA
ERDF funded grant schemes	Applications under the 3rd call of the ERDF R&D Grant Scheme and the 4th Call of the ERDF Start-Up Grant Scheme, ERDF International Competitiveness Scheme, and the ERDF Innovation Actions Grant Scheme have been processed during 2012 and resulted in an allocation of over €4.5 million in aid. In the coming weeks ME will be issuing a new scheme supporting investments in photovoltaic panels. The budget for this scheme is envisaged to be in the region of €4 million.	MEIB

FINANCIAL

Action	Description	Lead Entity
JEREMIE Financial Engineering Instrument	Commercial banks have been invited to participate in this initiative	MEAIM/MEIB
Promotion of uptake of RES and energy efficiency measures in the domestic sector	This measure aims to promote the uptake of solar water heaters and roof insulation and double glazing by issuing financial grants to households to encourage the purchase of new solar water heaters (maximum €400 per system installed) and the purchase of roof insulation and double glazing.	MEH/MRA

LIST OF WRITTEN SUBMISSIONS RECEIVED ON INITIAL DRAFT OF NZEB PLAN

- Malta Energy Efficiency and Renewable Energy Association
- Ministry of Energy and Health
- Heritage Malta
- Institute of Buildings and Construction Engineering MCAST
- Airmalta
- Ministry for Gozo
- Ministry of Finance
- Ministry for the Family and Social Solidarity
- Ministry for Transport and Infrastructure
- Ministry for European Affairs and Implementation of the Electoral Manifesto.

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