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Energy Service, Ministry of Energy, Commerce and Industry

Long-term Building Renovation Strategy

July 2024

Contents

1. Introduction

The Energy Union and the 2030 Energy and Climate Policy Framework establish ambitious commitments to further reduce greenhouse gas emissions, increase the share of renewable energy consumption and save energy to enhance its energy security,

competitiveness and sustainability.

In addition, the European Green Deal (EGD) and the 'Fit for 55' policy measures to implement it foresee even more ambitious commitments to reduce greenhouse gas emissions by at least 55 % by 2030 compared to 1990 and net zero by 2050.

Buildings are at the heart of energy efficiency policy, accounting for almost 40 % of final energy consumption at Union level and 40 – 45 % at national level. With the aim of facilitating the cost-effective transformation of existing buildings into highly energy efficient buildings in order to achieve the above targets, each Member State shall prepare a long-term renovation strategy and shall be submitted to the European Commission as part of the final integrated national energy and climate plan (NECP) referred to in Article 3 of Regulation (EU) 2018/1999 of the European Parliament and of the Council.

In accordance with Article 2a of the Energy Performance of Buildings Directive (EPBD) (Directive 2010/31/EU and Directive (EU) 2018/844), each Member State shall adopt a Long-term Strategy for the Renovation of the national stock of residential and non-residential buildings, public and private, and its transformation into a highly energy efficient and decarbonised building stock by 2050, facilitating the cost-effective transformation of existing buildings into nearly zero-energy buildings. Each long-term Renovation Strategy includes:

1. An overview of the national building stock based, where applicable, on statistical sampling and the expected rate of renovated buildings in 2020.
2. Identify cost-effective approaches to renovations depending on the building type and climatic zone, taking into account possible appropriate triggers in the lifecycle of the building, where relevant.
3. Policies and actions to stimulate cost-effective deep renovation of buildings, including staged deep renovation, as well as to support targeted cost-effective measures and renovations, for example by introducing a voluntary system of building renovation passports.
4. An overview of policies and actions concerning the worst performing segments of the national building stock, incentive dilemmas and market failures, and a description of national actions that help alleviate energy poverty.
5. Policies and actions relating to all public buildings.
6. Overview of national initiatives to promote smart technologies and well-interconnected buildings and communities, as well as to improve skills and education in the construction and energy efficiency sectors.
7. Evidence-based estimate of expected energy savings and wider benefits, such as those related to health, safety and air quality.

In Cyprus dwellings are estimated to account for 23 % of final energy consumption, while another 17 % is due to trade, hotels and services, mainly office buildings1. The various political, economic and social conditions that have prevailed for many years did not favour the implementation of energy-saving measures in the construction of buildings, resulting in a highly energy-intensive building stock. The first organised effort to implement energy saving measures in buildings was made in 2004 through the grant plans of the Renewable Energy and Energy Savings Fund (RES and Energy Savings Fund), while the implementation of mandatory measures in new buildings and buildings over 1000 square metres (m^2) undergoing major renovation was first carried out in 2007 with the adoption of the 2007 Decree regulating the energy performance of buildings (Minimum Energy Performance Requirements). The absence of thermal insulation and adequate sun protection during the summer months has negative effects on the economy and the environment, harms citizens' health, reduces the productivity of workers in workplaces buildings and generally reduces the quality of life. Deep building renovations provide an opportunity to solve many of these problems, as the energy saving potential is enormous, with almost 90 % of all buildings built before minimum energy performance requirements were introduced.

The Long-term Building Renovation Strategy (NDAR) highlights, with quantitative and qualitative indicators, the problems caused by the energy situation of the building stock as it stands today, as well as the opportunities offered by a greater mobilisation of investment in deep renovations. Identify the parties involved, the obstacles that exist and how these can be overcome. On the basis of the above data, the roadmap is presented with measurable progress indicators up to 2050.

The DRM, which was first prepared in 2020, is a development of the Strategy for the Mobilisation of Buildings Renovation Investments, which was adopted in 2014 and revised in 2017. As in the previous cases, it has been developed after consultation with interested parties. The consultation was carried out through the Legislative Advisory Committee on Promotion of Energy Saving in Buildings and Promotion of Zero Energy Buildings (Advisory Committee), which consists of 16 organisations and bodies involved in the buildings sector, with individual meetings with interested parties and sending a questionnaire. Account was also taken of the views recorded at meetings and workshops on issues related to the energy upgrading of buildings organised by the Energy Service of the Ministry of Energy, Commerce and Industry (YEEB) and other organisations. These meetings and workshops brought together specific interest groups such as employers' organisations, financial institutions and private organisations whose main task is energy research.

It is necessary to accelerate the pace at which renovations are implemented in order to achieve Cyprus' energy and environmental targets as recorded in the NECP. This pace needs to be even stronger to match the ambitions of 'Fit for 55' policy measures, which, among others, calls for a further increase in the pace and depth of renovation in Europe.

1Final energy consumption by sector 2021 – Eurostat

The aim is to upgrade the building stock in the most cost-effective way for the owner, while maximising the economic, environmental and social benefits for the country.

2. Overview of the national building stock

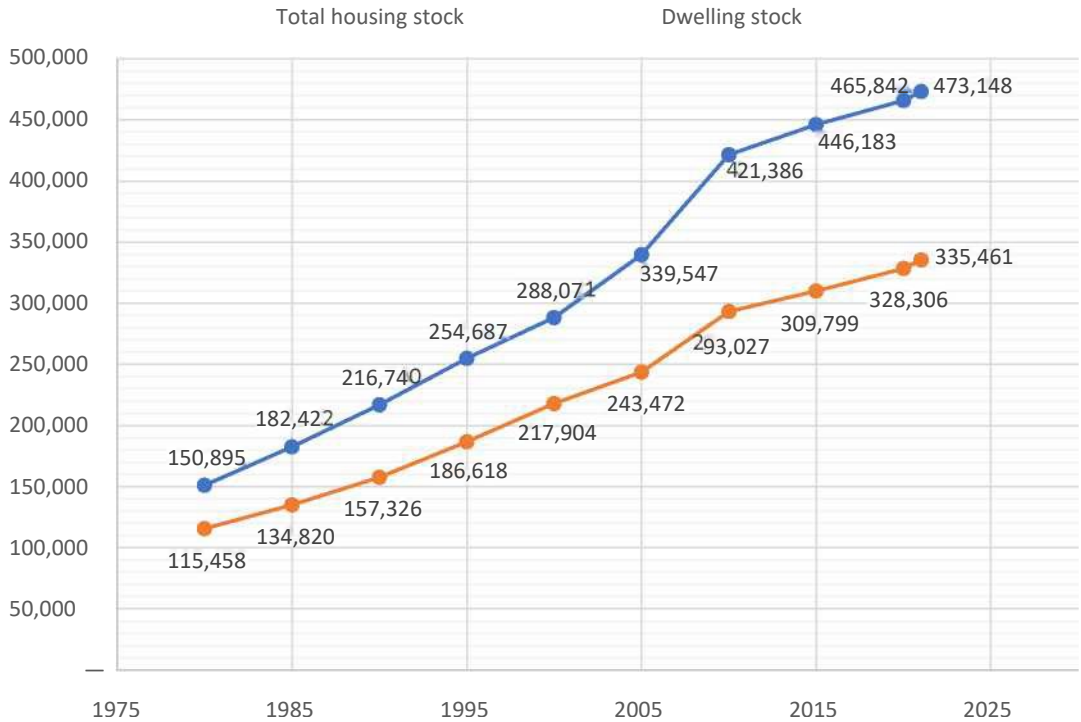
Cyprus has around 473.000 residential buildings and more than 34.000 non-residential buildings. Almost half of residential buildings are single-dwelling buildings. Cyprus' building stock is relatively new, as most buildings were built between 1980 and 2000. However, the absence of any policy measures at the time of building these buildings has led to the majority of existing buildings being poorly energy efficient. This is reflected in the final energy consumption of the buildings sector, where it has increased dramatically since the late 90s, with a slight decline in 2013 as a consequence of the economic crisis. The review of the existing building stock is divided into dwellings, non-residential and public buildings, and is based on available data from the Statistical Office and the technical reports 'Building Stock in Cyprus and Trends to 2030' by the Joint Research Centre (JRC), 'An energy efficiency strategy for Cyprus up to 2020, 2030 and 2050' (GIZ) and the report 'Revision of Cyprus Energy and Climate Plan – Task 5.2: Report on inputs and policy elements to update the Cypriot National Long-Term Renovation Strategy' by Trinomics consultant in collaboration with the Cyprus Institute. These reports were made in the context of technical assistance provided by the European Commission to the Ministry of Merchant Shipping.

2.1 Housing

An important parameter for assessing the energy performance of a building is the year of its completion. Chart 03 gives the temporal distribution of residential units built in Cyprus until 2020. Dwellings completed since 2010 account for 11 % of the total and are considered to have a heat-insulated shell. In other words, it is assumed that the dwellings applying for planning permission after 21December 2007 set the first minimum energy performance requirements are those that have been completed over a period of three years. However, it is noted that the minimum energy performance requirements for new buildings have been revised four times between 2007 and 2020. As a result, the most recent dwellings have significantly higher levels of thermal insulation and overall energy efficiency than dwellings completed on the basis of the first minimum energy performance requirements of 2007.

DFYKE 2.1: THESTOREY AND RESIDENTIAL STOCK IN K 2

The latest aggregated data showed that the total stock of residential units was 473.148 in



2021 and that the residential units used as permanent residence were 335.461.

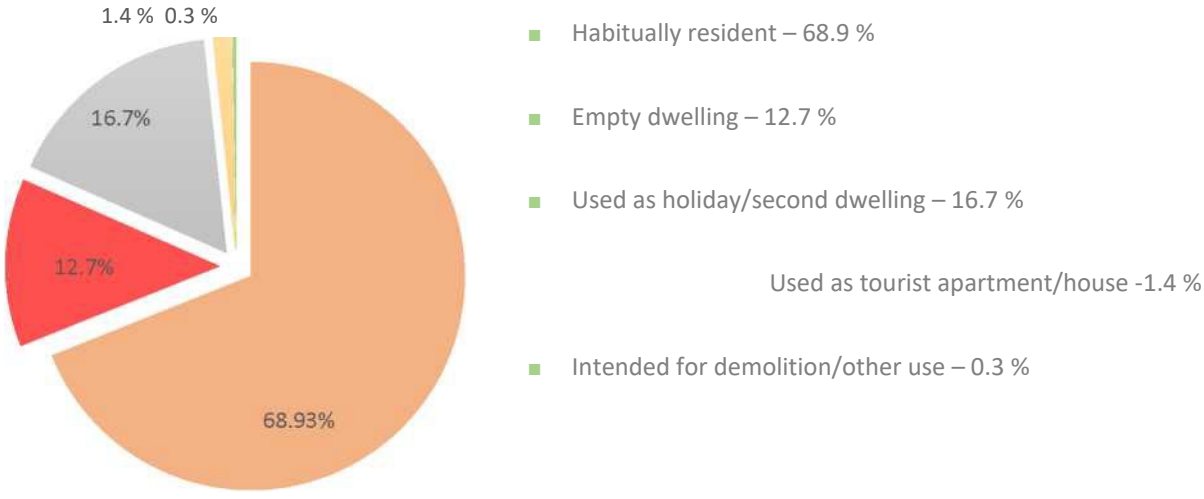
2Statistical Office of Cyprus – Construction and Housing Statistics.

Using the ratio of holiday and empty residential units to the total from the population and housing census data in Figure 04, it can be estimated that some 81.000 other housing units are used as holiday or tourist dwellings, which generally means that they have seasonal use and lower annual energy consumption, while a further 56.000 are empty, meaning that these dwellings are for sale or rent and some have been abandoned.

Almost half of the dwellings used for permanent residence are single-family dwellings, while apartments make up almost a quarter. The remaining percentage relates to various other types of dwellings, such as dwellings in continuous construction, dual dwellings and dwellings in a mixed-use building.

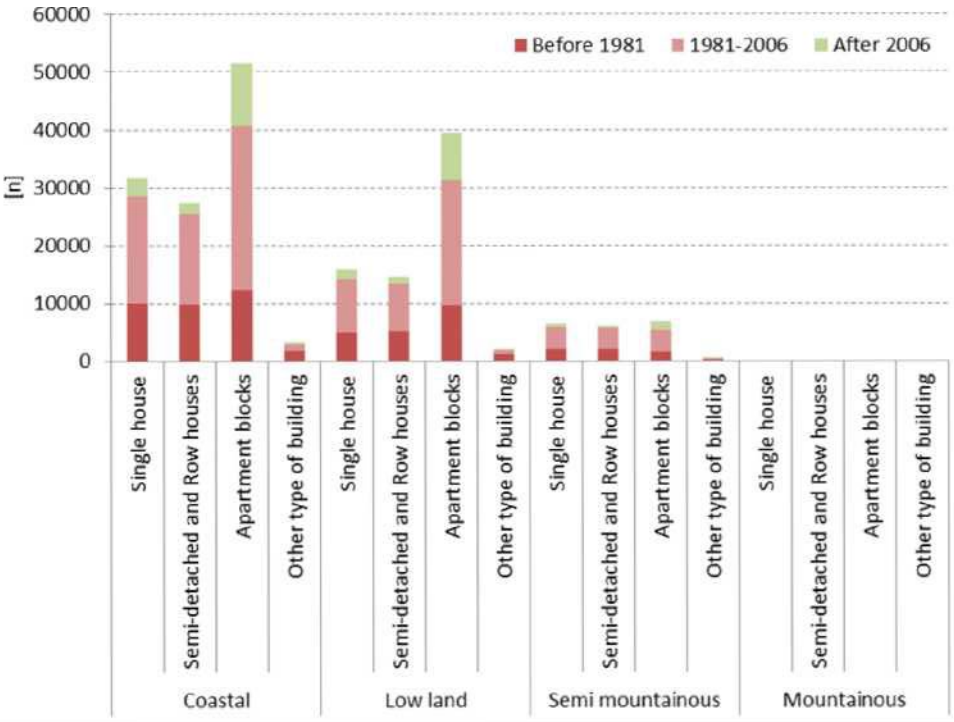
Chart 04 gives an overview of dwellings in terms of housing type and status as recorded by a survey by the Statistical Office carried out as part of a population census in 2011.

Interms of geographical distribution, 78 % are located in the coastal and lower lowland areas where larger urban centres are also located. Urban areas account for 90 % of multi-apartment buildings and 62 % of dual dwellings or dwellings in continuous construction.

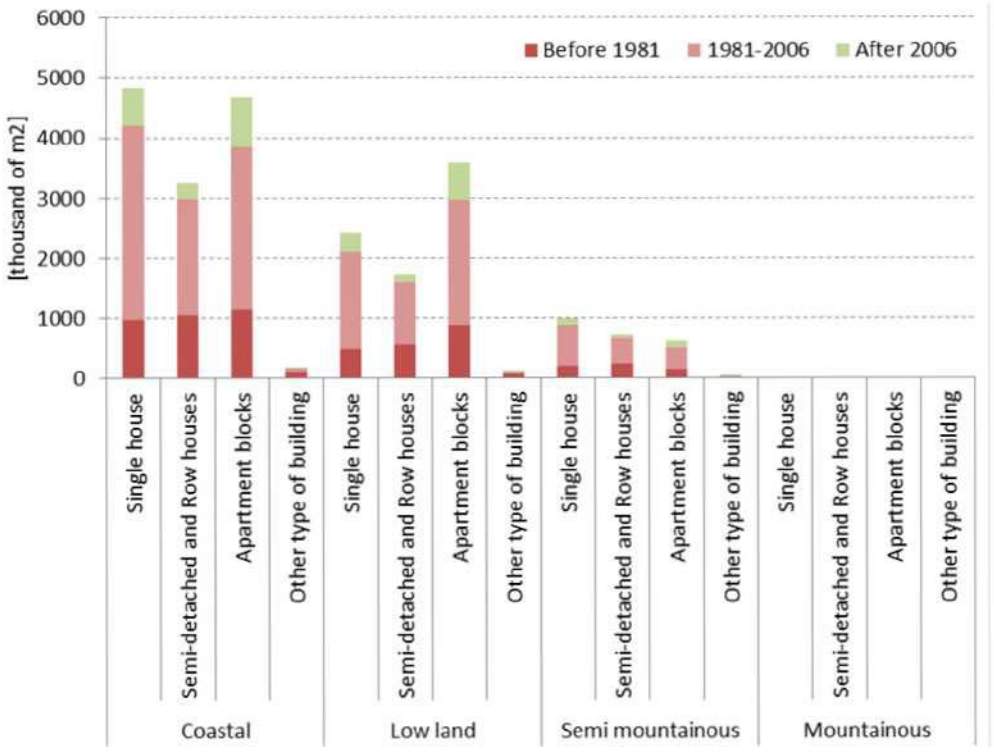


DFYKE 2.2: KRESIDENCE BREACH [3]

3 statistical Service of Cyprus – Population and Residence Census of 2011



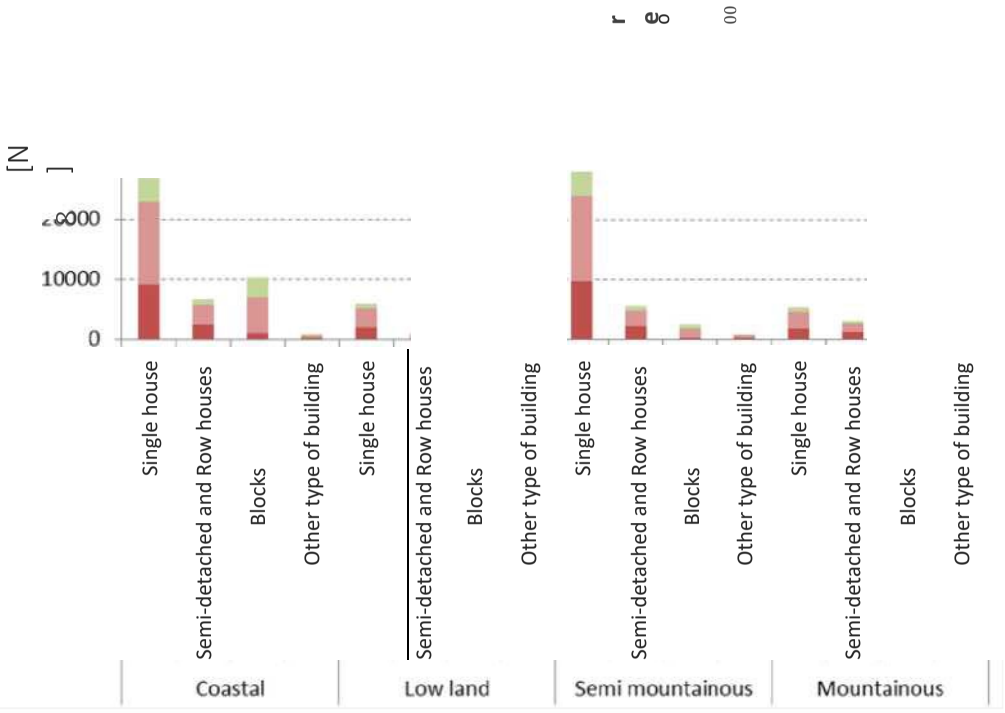
Διαγραμμα 2.3: Αριθμος κατοικιων ανα τυπο, μετεωρολογικη ζωνη και περιοδο κατασκευης - Αστικες Περιοχες [4]



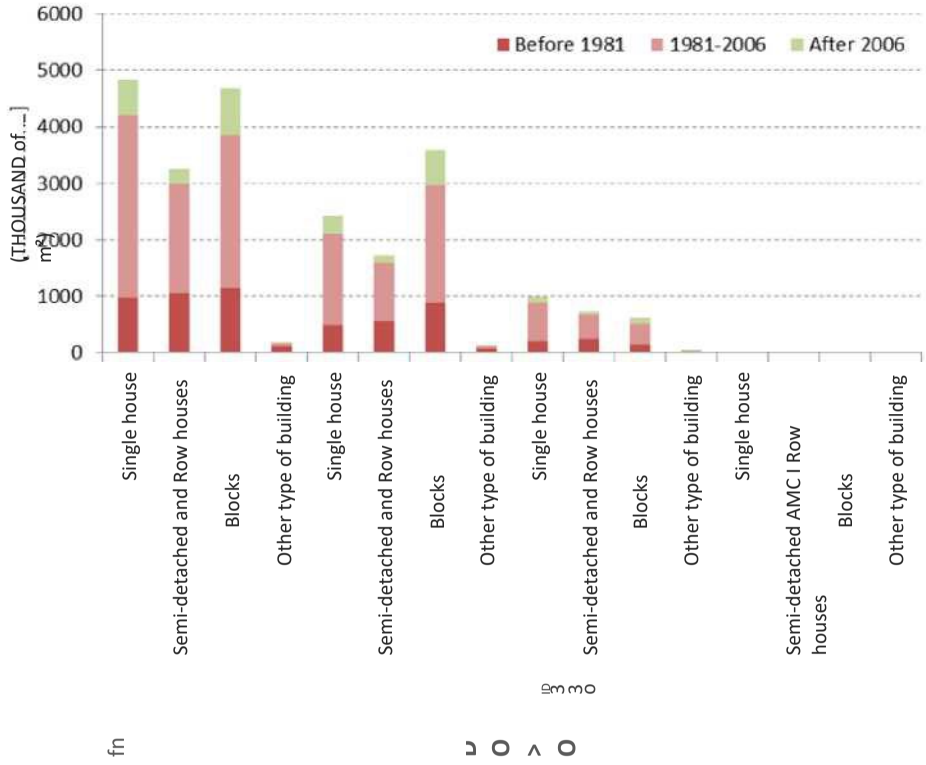
Διαγραμμα 2.4: Εμβαδο κατοικιων ανα τυπο, μετεωρολογικη ζωνη και περιοδο κατασκευης - Αστικες Περιοχες [4]

4 Zangheri, P. (2016). Building Stock in Cyprus and Trends to 2030, JRC Technical Reports.

Charts 07 and 08 show, respectively, the number and area of dwellings by type, meteorological zone and construction period for rural areas.



Διαγραμμα 2.5: Αριθμος κατοικιων ανα τυπο, μετεωρολογικη ζωνη και περιοδο κατασκευης - Αγροτικες Περιοχες [5]



5 Zangheri, P. (2016). Building Stock in Cyprus and Trends to 2030, JRC Technical Reports.

The meteorological zones referred to are those defined in the methodology for calculating the energy performance of a building as follows:

1. Coastline (Zone 1).
2. Lower lowland (Zone 2).
3. Semi-mountainous (Zone 3).
4. Mountain areas (Zone 4).

Over time, trends in the size of residential buildings appear to have changed. Table 03 shows that the area of single-family and multi-apartment buildings appears to be larger in newer buildings. However, for compartments, the tendency is to narrow in area.

Type of home	Construction period	Area (m^2)	Volume (m^3)	Number of floors	Panel area (m^2)	External masonry area (m^2)	Number of households
Single-family house	Before 1970	132,1	396,3	1	10	188,4	1
	1971-1990	151,2	453,6	1	17,9	148,8	1
	1991-2007	141,4	424,0	1	22,1	155,6	1
	After 2008	202,2	606,6	2	43,3	276,6	1
Double residence	Before 1970	265,4	796,2	1	20	342	2
	1971-1990	300,2	900,7	1	30,9	231,6	2
	1991-2007	302,4	900,7	2	38,8	297,6	2
	After 2008	302,8	908,4	2	35,7	319,2	2
Dwellings in continuous construction (more than two)	Before 1970	718,5	2155,5	1	92,1	801	3
	1971-1990	842,7	2528,2	1	89,2	802,5	3
	1991-2007	1001,6	3004,8	1	127,1	921,6	3
	After 2008	1335,5	4006,4	1	169,5	1228,8	4
Multi-dwelling buildings	Before 1970	345,4	1022,6	3	62,3	380,3	3
	1971-1990	690,8	2072,4	3	133	916,8	6
	1991-2007	690,8	2072,4	3	133	916,8	6
	After 2008	861,4	2181,7	4	164	1064	8

PINAKA 2.1: XSTANDARD DWELLING ARACTERIES BY TYPE AND CONSTRUCTION PERIOD [6]

The share of the residential sector in final energy consumption increased between 1994 and 2011, from 9.8 % in 1994 to 22 % in 2011. Electricity consumption increased mainly due to the installation of air conditioners and the increasing number of household electrical appliances. However, the annual energy consumption per dwelling decreased from 1.16 tonnes of Oil Equivalent (toe) in 2000 to 0,85 toe in 2013 and to 0,75 toe in 2021. At the same time, the share of the residential sector in energy consumption has remained roughly stable since 2011. This can partly be attributed to the improvement in the energy performance of buildings with the implementation of the EPBD since the end of 2007. 6

Forty per cent (32 %) of homes in Cyprus were erected before 1980 and 58 % of them were erected between 1981 and 2010. That is, the vast majority of homes were constructed when there were no minimum energy performance requirements in force. In the absence of legislative measures, no energy saving measures were generally taken during construction,

6GIZ (2017), An energy efficiency strategy for Cyprus up to 2020, 2030 and 2050

with the result that the energy situation of the large majority of dwellings can be characterised as very poor to moderate. Some homeowners took individual savings measures ex post, benefiting from the R & E Fund grant plans and then the 'Save Upgrade' project for deep renovation. Given that the buildings renovated between 2015 and 2023 were mainly implemented through 'Save – Upgrading', the renovation rate in the residential sector for this period is not expected to exceed 0.5 % per year (more details on the 'Save – Upgrade' project are set out in paragraph 4.2.2). Therefore, these interventions, although important, did not change the overall energy profile of the residential sector.

As shown in Table 04, the main energy product used in dwellings is grid electricity, as it accounts for almost half of final energy consumption, with heating oil and LPG being the most important energy products after electricity.

Fuel	Final energy consumption – households (TJ)
Natural gas	**0**
Oil and petroleum products	**4.516,473**
Liquefied gas	1.664,014
Other kerosene	514,037
Gas oil and diesel oil	2.338,422
Fuel oil	0
Renewables and biofuels	**4.176,932**
Solar thermal energy	2.721,266
Ambient heat (heat pumps)	534,254
Primary solid biofuels	634,111
Charcoal	287,301
Biogas	0
Electrics	**6.401,826**
Heat	**0**
Total	**15.095,230**

PINAKA 2.2: GLASSENERGY CONSUMPTION IN THE RESIDENTIAL SECTOR BY TYPE OF FUEL IN 2022 [7]

7 final energy consumption 2022 – Eurostat

According to the calculation of the share of energy from Renewable Energy Sources (RES) under Directive (EU) 2018/2001, for 2022 solar energy for hot water in dwellings is the most widely used, with solar thermal installed to produce hot water in 91 % of dwellings. A study has also been carried out on the benefits of RES energy from replacing older solar thermal systems in which it has been estimated that a typical solar system has lost energy production of around 18 kWh per year. Air-air heat pumps are used for air conditioning purposes, where there is a clear trend to install them in new dwellings, contributing in 2022 to around 22 % of total consumption for heating and cooling in dwellings. The use of biomass and geothermal heat pumps is very low. For 2022, around 48 % of final energy

consumption for heating and cooling in residential buildings was covered by RES.

From 2005 onwards, photovoltaic (PV) systems began to be installed in dwellings, initially with a subsidised price for the electricity they produce and then using the method of offsetting consumption with electricity generation. By July 2024, photovoltaic systems were installed in more than 46.750 dwellings. A breakdown by the end of 2023 is given in Table 09.

In a typical dwelling, provided that the conditions of thermal comfort are met in the dwelling, the greatest energy consumption is due to air conditioning and heating. The most widespread heating system in single-family houses is a central heating system with an oil boiler, as opposed to apartments, in which independent air conditioners are used for heating. Independent air conditioners are the most common air conditioning system used in summer months in all types of homes. However, half of the dwellings do not have some kind of central heating installed, while 18 % of the dwellings do not have an installed air-conditioning system, which combined with the absence of thermal insulation in most of the dwellings leads to the conclusion that a large part of households are compatible with moderate to poor thermal comfort conditions.

Tables 06 and 05 give a breakdown of the types of heating and air-conditioning systems, respectively, by type of dwelling.

Air-conditioning system	Fuel	Single-family house	Two-family houses and terraced houses	Departments	Other types of houses
Central heat pump system	Electrics	4 % (4 %)	4 % (4 %)	5 % (5 %)	0 % (0 %)
Central system with a ground source heat exchanger	Electrics	0 % (0 %)	0 % (0 %)	0 % (0 %)	0 % (0 %)
Independent air conditioners	Electrics	62 % (62 %)	62 % (62 %)	61 % (61 %)	65 % (65 %)
Independent high efficiency air conditioners	Electrics	16 % (16 %)	16 % (16 %)	15 % (15 %)	16 % (16 %)
No or other air conditioning equipment	N/A	18 % (18 %)	18 % (18 %)	18 % (18 %)	18 % (18 %)

PINAKA 2.3: INTHE CLIMATE ZONE BY TYPE OF HOUSING IN URBAN AREAS AND IN BRACKETS IN RURAL AREAS [8]

Heating systems	Fuel	Single-family house	Two-family houses and terraced houses	Departments	Other types of houses
Central heating system with an oil boiler	Oil	41 % (27 %)	35 % (25 %)	17 % (5 %)	23 % (9 %)
Central heating system with a condensing boiler	Oil or liquefied gas	0 % (0 %)	0 % (0 %)	0 % (0 %)	0 % (0 %)
Oil stove	Oil	2 % (2 %)	2 % (2 %)	2 % (1 %)	1 % (2 %)
Central heating system with a liquefied gas boiler	LPG	3 % (3 %)	1 % (2 %)	0 % (1 %)	0 % (1 %)
Liquefied gas heater	LPG	11 % (17 %)	11 % (19 %)	9 % (13 %)	28 % (21 %)
Heat pump	Electrics	4 % (3 %)	4 % (2 %)	5 % (2 %)	0 % (2 %)
Heat pump with a ground source heat exchanger	Electrics	0 % (0 %)	0 % (0 %)	0 % (0 %)	0 % (0 %)
Independent air conditioners	Electrics	17 % (17 %)	23 % (19 %)	35 % (42 %)	14 % (19 %)
Independent high efficiency air conditioners	Electrics	4 % (4 %)	6 % (5 %)	9 % (11 %)	4 % (5 %)
Electric stoves	Electrics	8 % (10 %)	9 % (12 %)	11 % (15 %)	20 % (29 %)
HHK thermoaccumulators	Electrics	2 % (1 %)	3 % (1 %)	6 % (1 %)	0 % (0 %)
Greaves	Biomass	4 % (13 %)	3 % (12 %)	1 % (2 %)	1 % (3 %)
No or other means of heating	N/A	3 % (2 %)	2 % (2 %)	5 % (8 %)	7 % (9 %)

PINAKA2.4: HEATINGSYSTEM BY TYPE OF HOUSING IN URBAN AREAS AND IN BRACKETS IN RURAL AREAS [8]

Table 07 shows the estimated energy demand depending on the type of dwelling and its construction period. As energy demand does not take into account the technical system used, this table shows the efficiency of the shell in terms of thermal insulation per construction period.

8 Zangheri, P. (2016). Building Stock in Cyprus and Trends to 2030, JRC Technical Reports.

	Year of manufacture	Space heating (kWh/m²/time)	Space cooling (kWh/m²/time)	Domestic hot water (kWh/m²/time)
Single-family house	Before 1981	54	72	23
	1981 – 2006	40	54	18
	After 2006	36	50	15
Two-family houses and terraced houses	Before 1981	59	58	23
	1981 – 2006	43	44	18
	After 2006	39	40	15
Departments	Before 1981	45	105	23
	1981 – 2006	33	84	18
	After 2006	30	76	15
Other types of houses	Before 1981	56	53	23
	1981 – 2006	41	41	28
	After 2006	37	38	15

PINAKA 2.5: REQUESTFOR ACTION PER TYPE OF RESIDENCE [8]

2.2 Non-residential buildings

In 2020, there were 115.746 non-residential accommodation, of which 43.900 in Nicosia (38 %), 34.169 (30 %) in Limassol, 17.845 (15 %) in Larnaca, 12.681 (11 %) in Paphos and 7151 (6 %) in Famagusta910. It should be borne in mind that, especially in the tertiary sector, a building may comprise several individual premises (e.g. a building with several offices or a shopping centre), so these statistics do not reflect the actual number of non-residential individual buildings. It is estimated that in Cyprus non-residential buildings, including the public sector, are around 34.000, with a total surface area of 9 million m². In terms of the use of these buildings, the most populous in number of accommodation are offices, retail and restaurant areas. However, per area the largest category of buildings is the hotel and accommodation sector, with a total surface area of 2 million m². Table 08 shows the total number and area for non-residential building types.

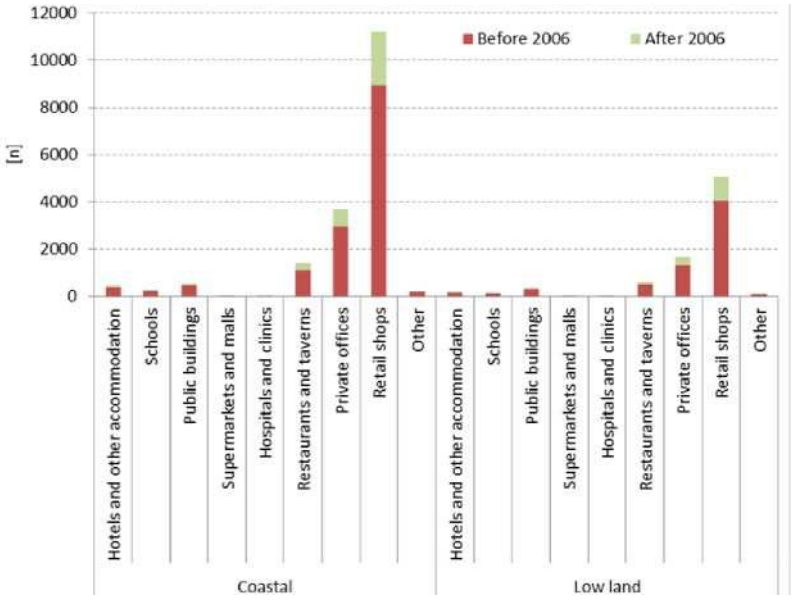
	Total area (m²)	Number of accommodation	Average floor area (m²)
Hotels	2.094.134	766	2.734
Junior and senior high schools and technical schools	613.546	144	4.261
Primary schools	453.755	325	1.396
Child care centres	96.376	419	230
Public buildings	1.886.370	1.087	1.735
Airports	119.600	2	59.800
Hypermarkets and compartment stores	280.396	67	4.185
Hospitals and clinics	485.898	83	17.354
Restaurants and bars	179.360	2242	80
Private offices	1.665.000	11.100	150
Retail sales facilities (stores)	1.080.000	18.000	60

PINAKA 2.6: THENUMBER AND NUMBER OF CATALYSTS PER TYPE OF BUILDING IN BUILDINGS NOT USED AS RESIDENTIAL BUILDINGS [10]

Just like in the residential sector, 90 % of the buildings used for the provision of services or other business purposes were constructed before adopting any minimum energy performance requirements. The vast majority of non-residential buildings are located in the coastal and lower lowland areas (meteorological zones 1 and 2).

9Vision of Cyprus Energy and Climate Plan – Task 5.2: "Report on inputs and policy elements to update the Cypriot National Long-Term Renovation Strategy" by Trinomics consultant in cooperation with the Cyprus Institute.
10Economidou, M. (2016). Table 33, Summary of non-residential building stock in Cyprus, Long-term Strategy for Mobilising investments for renovating Cyprus national building stock – JRC Technical Reports.

Figure 09 shows the number of buildings by type, dividing them into buildings constructed before and after 2006.



DFYKE 2.7: ARIM OF BUILDINGS NOT USED AS DWELLING IN COASTAL AND LOWLAND AREAS [11]

The non-residential buildings sector meets its energy needs by 68 % with the use of electricity. Table 09 gives the sector's energy consumption by energy product. For RES, mainly PV systems are used, with installations in more than 8.250 non-residential buildings by July 2024.

Fuel	Final energy consumption – other sectors – commercial and public services (TJ)
Natural gas	**0**
Oil and petroleum products	**1.451,622**
Liquefied gas	545,322
Other kerosene	90,710
Gas oil and diesel oil	653,783
Fuel oil	161,807
Renewables and biofuels	**2.354,057**
Solar thermal energy	385,225
Ambient heat (heat pumps)	1.578,167
Primary solid biofuels	166,307
Charcoal	191,544
Biogas	27,412
Electrics	**8.189,374**
Heat	**0**
Total	**11.995,052**

PINAKA2.7: GREEKENERGY CONSUMPTION IN THE FIELD OF TRADE AND PUBLIC SERVICES FOR THE YEAR 2022 [12]

11 Zangheri, P. (2016). Building Stock in Cyprus and Trends to 2030, JRC Technical Reports.
12 final energy consumption 2022 – Eurostat

Grid electricity The technical systems installed in tertiary sector buildings are different depending on the type of building. Central heating with a boiler is the main heating system in hotels, while central heating with a heat pump is the main system in offices, shops and supermarkets. The majority of tertiary sector buildings have a centralised air-conditioning system. Relevant data are presented in Tables 10 and 11.

	Fuel	Hotels	Private offices	Retail sales facilities (stores)	Hospitals and clinics	Hypermarkets and compartment stores	Restaurants and bars
Central heating system with an oil boiler	Oil	43 %	41 %	12 %	31 %	11 %	28 %
Central heating system with a condensing boiler	Oil or liquefied gas	2 %	1 %	0 %	1 %	1 %	0 %
Central heating system with a liquefied gas boiler	LPG	10 %	4 %	2 %	4 %	1 %	3 %
Heat pump	Electrics	40 %	44 %	75 %	61 %	81 %	36 %
Heat pump with a ground source heat exchanger	Electrics	0 %	1 %	0 %	1 %	2 %	0 %
Independent air conditioners	Electrics	3 %	6 %	8 %	0 %	8 %	18 %
Independent high efficiency air conditioners	Electrics	1 %	1 %	1 %	0 %	1 %	5 %
No or other means of heating	N/A	1 %	0 %	0 %	0 %	0 %	0 %

PINAKA2.8: INHEATING SYSTEM PER BUILDING TYPE IN NON-RESIDENTIAL BUILDINGS [13]

	Fuel	Hotels	Private offices	Retail sales facilities (stores)	Hospitals and clinics	Hypermarkets and compartment stores	Restaurants and bars
Central heat pump system	Electrics	62 %	54 %	75 %	68 %	88 %	42 %
Central system with a ground source heat	Electrics	0 %	1 %	0 %	1 %	2 %	0 %
Independent air conditioners	Electrics	24 %	22 %	8 %	9 %	0 %	28 %
Independent high efficiency air conditioners	Electrics	4 %	3 %	1 %	2 %	0 %	5 %
No or other air conditioning equipment	N/A	10 %	20 %	16 %	20 %	10 %	25 %

PINAKA 2.9: CCLIMATE SYSTEM BY TYPE OF BUILDING IN NON-RESIDENTIAL BUILDINGS [13]

Table 012 shows the estimated energy demand per building type.

13 Zangheri, P. (2016). Building Stock in Cyprus and Trends to 2030, JRC Technical Reports.

	Year of manufacture	Space heating (kWh/m²/time)	Space cooling (kWh/m²/time)	Domestic hot water (kWh/m²/time)	Lighting (kWh/m²/time)
Hotels	Before 2006	65	268	40	55
	After 2006	45	183	28	50
Private offices	Before 2006	87	203	5	45
	After 2006	59	138	4	40
Retail sales facilities (stores)	Before 2006	41	194	5	105
	After 2006	28	132	4	95
Hypermarkets and compartment stores	Before 2006	33	470	1	105
	After 2006	23	321	1	95
Restaurants and bars	Before 2006	142	285	214	85
	After 2006	97	194	146	80

ΠΙΝΑΚΑ2.10: ΓΕΝΕΡΓΥ SUPPLY PER TYPE OF BUILDING IN BUILDINGS NOT USED AS RESIDENTIAL BUILDINGS [14]

2.3 Buildings owned and/or occupied by the public sector

For buildings owned and/or occupied by the public sector, although they are part of tertiary sector buildings, a specific review of the building stock for this sector is a necessary reason for their exemplary role in the area of energy performance of buildings. It should be noted that 'public building' is not defined in the Law regulating the energy performance of buildings or in the Energy Efficiency Law. However, the recast Energy Efficiency Directive (Directive (EU) 2023/1791) sets out the exemplary role of buildings owned by public bodies, where 'public bodies' means national, regional or local authorities and entities directly funded and managed by those authorities, but not having an industrial or commercial character.

For the purposes of this text, the reference to public buildings refers to buildings used by central government authorities and sub-central contracting authorities as defined in Annex I to the 2016 Law on the Regulation of Public Procurement Procedures and Related Matters.

Public buildings are typically used as offices and follow a similar age distribution as private sector office buildings, resulting in low energy efficiency. This is also confirmed by the Energy Performance Certificates (EPCs) issued for these buildings.

Local government in the area controlled by the Republic of Cyprus consists of 20 municipalities and 349 communities. Most of the municipalities and larger communities only have one building used for administrative purposes and events. However, they own more buildings to serve the public, as well as other buildings such as libraries and sports centres.

As regards public schools, a total of 2022 public and 2023 community kindergartens, 272 primary schools, 75 special schools and 9 secondary schools operated during the 328-114 school years, of which 5 are for secondary schools and 13 Technical and Vocational Education and Training

13 Zangheri, P. (2016). Building Stock in Cyprus and Trends to 2030, JRC Technical Reports.

Schools. The technical services of the Ministry of Education, Sport and Youth (Ministry of Education, Sport and Youth) are responsible for the implementation of projects related to the construction of new schools and the maintenance and extension of existing ones. Most have been erected before 2006, while almost all use central boiler heating to meet heating needs in winter, and generally there is no air-conditioning in classrooms. There are air-conditioning systems installed in school rooms with special operating conditions, special needs and specific user cases, such as in directors' and secretarial offices, teachers' rooms, doctors' surgeries, amphitheatres, event rooms, summer school workshops, special education units, special classrooms, etc.

As regards public universities, the University of Cyprus, which is the largest public university, owns the highest number of buildings, most of which were erected in the campus in recent years. The Cyprus University of Technology is housed mainly in historic buildings and rented ones in downtown Limassol, whereas the Open University of Cyprus is housed in a building in Nicosia. Public universities operate technical departments that are responsible for the maintenance and smooth functioning of their building facilities. Data on energy consumption in public buildings are shown in Table 013.

	Year of manufacture	**Space heating**	**Space cooling**	**Domestic hot water**	**Lighting**
		(kWh/m²/time)			
Public buildings	Before 2006	49	44	5	42
	After 2006	34	30	4	37
Schools	Before 2006	35	55	7	35
	After 2006	24	37	5	30

PINAKA 2.11: GENERGY PER TYPE OF PUBLIC SECTOR [15]

2.4 Croci, L., Realini, A (2019). Termination of the actual energy demand of different types of buildings and processes, RSE, Report to the European Commission's Structural Reform Support Service, Deliverable 3.2, Contract no. SRSS/S2017/048, Milan.

3. Cost-effective approaches to building renovations

The calculation of cost-optimal levels of minimum energy performance requirements, first done in 2013 and repeated every five years on the basis of Article 5 of the EPBD, provides an opportunity to consider the most cost-effective ways of renovating buildings by taking into account the initial capital expenditure and operational costs in the lifecycle of the building. In addition, cost-optimal approaches have been examined through technical studies carried out on behalf of the Ministry of Energy, Commerce and Industry. This chapter lists good economic and technical practices for implementing measures to improve the energy performance of buildings.

3.1 Results of calculation of cost-optimal levels of minimum energy performance requirements

The most recent calculation of cost-optimal levels of minimum energy performance requirements has been done in 2023. It has calculated cost-optimal levels in eighteen (18) reference buildings for the following categories of buildings:

1. Single-family house
2. Multi-dwelling buildings
3. Office
4. Primary or secondary school (including sports facilities) 5. Hospital

6. Hotel (including restaurants)

Three reference buildings were created for each category of buildings, one for a new building and two for existing buildings. Shops are included in a new and an existing reference building of the category ‘Multi-dwelling’, and in an existing reference building of the ‘Office’ category.

The reference buildings were defined in the statistical database and expert surveys and reflect the recording of the building stock as recorded in the 2020 Long-term Building Renovation Strategy. Both the choice of the type of buildings and their architectural, energy and other characteristics were chosen to represent the average and typical building stock.

The reference buildings shall be located in meteorological zones 1 (coastal zone) and 2 (lowland zone) as defined in the energy performance calculation methodology. The vast majority of buildings are located in these two zones. However, for reference buildings of the ‘single-family’ type, additional calculations have been made for meteorological zones 3 (semi-mountainous zone) and 4 (mountain zone). Statistically, single-dwelling is the most common type of building in semi-mountainous and mountainous.

The results of the calculation in terms of minimum energy performance requirements for buildings undergoing major renovation were the following: are:

1. The heat-permeability coefficients for all types of buildings must be lower than the current maximum permitted levels in order to be economically optimal.
2. The requirement for residential buildings to be of energy class A after a deep renovation is economically optimal.
3. The requirement for non-residential buildings to be of energy class B + after a major renovation is not economically optimal. The renovation of these buildings should lead to energy class A in order to be at optimal economic levels.
4. The share of total primary energy consumption from RES for residential buildings ranges from 52 to 76 % to be at economically optimal levels, while there is currently no requirement to do so.
5. The coverage of a significant proportion of total primary energy consumption from RES for non-residential buildings is economically optimal. However, this percentage varies significantly by type of building, and there is currently no requirement to do so.

In addition, according to the 2023 calculation, the individual measures providing a high economic benefit to the lifecycle of the building are:

1. Roof thermal insulation.
2. Heat pumps for heating.
3. Biomass boilers.
4. High-efficiency air-conditioning units.
5. Led lighting.
6. Photovoltaic.

The above-mentioned results relate to the economically optimal solution from the point of view of investors rather than to the broader macroeconomic point of view, and are based on a number of assumptions that are more important:

1. The lifecycle of the building was set at 30 years for residential and public buildings and 20 years for the remaining buildings.
2. The discount rate was set at 5 % for dwellings and 11 % for tertiary sector buildings.
3. The average annual rate of increase in electricity prices is 1.5 % and for petroleum products 1.2 %.

In accordance with Article 15 of the Energy Performance of Buildings Regulation Law (Law 142 (I)/2006), the minimum energy performance requirements of a building shall be revised at regular intervals not exceeding five years to reflect technical progress in the building sector. Taking into account that the current requirements became applicable on 1 July 2020, new requirements should then be introduced in 2025.

3.2 points in the lifecycle of the building that increase the chances of its renovation

During the lifecycle of a building there are points that trigger major renovation. The most common of these are:

1. When transferred to a new owner.
2. When rented to a new tenant.
3. When a static and/or aesthetic upgrade has taken place.
4. When a change of use and/or additions are made.

According to the replies we received to the questionnaire in Annex II.G, the activation of more energy upgrades can be achieved during the static upgrading of a building, followed by an aesthetic upgrade and a change of use of the building. Depending on the type of building, the same location may have different chances of triggering a major renovation. For example, a new owner in a dwelling is very likely to carry out a renovation, but this is not the case with a change of ownership in a hotel, where renovations are mainly driven by competition in the tourism sector.

At the same time, in some categories of buildings, the above points may not have any possibility of triggering renovation. For example, when the building is rented to a new tenant but the rent cannot be increased, there is no interest from the owner to improve the energy performance of the building.

Minimum energy performance requirements shall apply to major renovations, as well as to elements of the envelope replaced or retrofitted. However, the implementation of the requirements alone does not ensure that the energy savings potential that is economically optimal is fully exploited. For this reason, synergies with energy-saving measures that will lead to economies of scale should be considered when there is a planned renovation or a renovation triggered by the reasons set out above.

In addition to points in the lifecycle of a building, energy renovations are also triggered by legislative measures and policies such as those detailed in paragraphs 4.1, 4.2, 6.1 and 6.3. The most important of which are:

1. Availability of financial incentives and funding mechanisms.
2. Mandatory renovation rates for buildings owned and used by central government.
3. Purchase and rental of buildings by central government only in energy-efficient buildings.

Finally, the recast Energy Efficiency and Buildings Efficiency Directives (EPBD) introduce new legislative measures to trigger renovations as described in Chapter 4.5.1.

4. Policies and actions for cost-effective deep renovation of buildings

Policies and measures to boost the renovation of existing buildings can be categorised into legislative, incentive, training and information measures. An analysis of the current state of play is provided below, and the relevant obstacles along how to overcome them are identified.

Some of the measures mentioned below concern actions targeting individual building elements such as inspections of heating and air-conditioning systems and requirements for technical systems. However, they can trigger a deep renovation or be part of a staged deep renovation.

4.1 Legislative action

4.1.1 Minimum energy performance requirements for existing buildings

Minimum energy performance requirements for existing buildings shall apply when they undergo major renovation and where elements of their envelope are replaced or retrofitted. The first Minimum Energy Performance Requirements Decree, adopted in 2007, made the energy upgrading of buildings above 1 000 m² subject to major renovation mandatory. In 2009, the minimum requirements were revised and added to them an EPC with a minimum category B for buildings above 1 000 m² undergoing major renovation. In December 2013, a new Decree was adopted, which reduced the thermal permeability rates by 15 %, while requirements were set for the first time for elements of the envelope to be retrofitted or replaced regardless of the size of the building. As of 1January 2017, the obligation for buildings undergoing major renovation to be of minimum energy class B has been extended to all buildings of any size.

The existing minimum energy performance requirements became applicable from 1July 2020. These require all residential buildings undergoing major renovation to be of energy class A, and at least energy class B + all other buildings. In addition, minimum energy performance requirements apply to elements of the envelope that are replaced or retrofitted. The current requirements have been developed on the basis of the results of the calculation of the cost-optimal levels of minimum energy performance requirements carried out in 2018, as well as the views of all parties involved in the prior consultation through the relevant Advisory Committees.

Table 05 shows chronologically the changes in minimum energy performance requirements since 2007.

Minimum Energy Efficiency Requirements in accordance with:		REGULATORY ADMINISTRATIVE ACT	REGULATORY ADMINISTRATIVE ACT	REGULATORY ADMINISTRATIVE ACT	REGULATORY ADMINISTRATIVE ACT	REGULATORY ADMINISTRATIVE ACT 121/2020
In force since		21/12/2007	1/1/2010	11/12/2013	1/1/2017	1/7/2020
Major renovation	**Maximum thermal permeability coefficient of walls and elements of the structural structure forming part of the building envelope**	0,85 W/2 K only in buildings over 1 000 m²	0,85 W/m² K only in buildings above 1 000 m²	0,72 W/m² K only in buildings above 1 000 m²	—	—
	Maximum thermal permeability coefficient of horizontal building elements and ceilings forming part of the building envelope	0,75 W/m² K only in buildings above 1 000 m²	0,75 W/m² K only in buildings above 1 000 m²	0,63 W/m² K only in buildings above 1 000 m²	—	—
	Maximum thermal transmittance for floors of closed non-heated space	2,0 W/m² K only in buildings above 1 000 m²	2,0 W/m² K only in buildings above 1 000 m²	2,0 W/m² K only in buildings above 1 000 m²	—	—
	Maximum thermal permeability coefficient of frames forming part of the building envelope	3,8 W/m² K	3,8 W/m² K only in buildings above 1 000 m²	3,23 W/m² K only in buildings above 1 000 m²	—	—
	Maximum average shading coefficient in sleeves forming part of the building envelope	—	—	0,63 only in buildings over 1 000 m²	—	—
	Minimum energy class in EPC	—	B only in buildings above 1 000 m²	B only in buildings above 1 000 m²	B all buildings	A for residential buildings B + for non-residential buildings
Building elements that are replaced or installed subsequently	**Maximum thermal permeability coefficient of walls and elements of the structural structure forming part of the building envelope**	—	—	0,72 W/m² K all buildings	0,4 W/m² K all buildings	0,4 W/m² K all buildings
	Maximum thermal permeability coefficient of horizontal building elements and ceilings forming part of the building envelope	—	—	0,63 W/m² K all buildings	0,4 W/m² K all buildings	0,4 W/m² K all buildings
	Maximum thermal transmittance for floors of closed non-heated space	—	—	2,0 W/m² K only in buildings above 1 000 m²	—	—
	Maximum thermal permeability coefficient of frames forming part of the building envelope	—	—	3,23 W/m² K all buildings	2,9 W/m² K all buildings	2,25 W/m² K all buildings
	Maximum average thermal permeability coefficient of the building envelope excluding horizontal building elements	—	—	0,63 all buildings	—	—

ΠΙΝΑΚΑ 4.1: ΑΜΙΝΙΜΟΜ ΕΝΕΡΓΥ ΕΦΦΙΣΙΕΝΣΥ ΡΕΟΥΙΡΕΜΕΝΤ ΦΟΡ ΕΧΙΣΤΙΝΓ ΒΥΙΛΔΙΝΓΣ

4.1.2 Energy performance certificates

The Energy Performance Certificate (EPC) is a reliable way to illustrate the energy condition of an existing building and to record recommendations for its upgrading. It is required to be presented to the proposed buyer or tenant and a copy of it must be given to the new tenant or buyer. In addition, commercial advertisements for buildings rented or sold should indicate the energy class. Therefore, the EPC with the information it provides is a tool to trigger renovation at the point of a building's life cycle where it is sold or rented out to a new tenant. To date, 97.525 EPCs have been issued. However, only 15.8 % of all those issued relate to existing buildings, which may lead to the conclusion that the issuance of EPCs for sale and rental purposes remains low. This can be attributed to the following reasons:

1. Absence of legislation linking the EPC to the market/sales document and the rental contract.
2. No information on the energy performance certificate provided to would-be buyers or tenants of buildings;
3. Would-be buyers or tenants of buildings, owners and real estate professionals find it difficult to 'translate' the data shown on the energy performance certificate into building operating costs;
4. Relatively little value added to the sales or rental price that the building owner can obtain due to the high energy performance.

The above obstacles have not allowed the energy performance certificate to gain full momentum as an indicator that affects the value of properties and, ultimately, fostering the energy upgrading of existing buildings. In order to increase the visibility of the EPC among the general public from 2015 onwards, financial incentives were linked to the issuing of an EPC, as in the case of the 'Save – Upgrading' project, and has been included in information campaigns organised by the Ministry of Mercantile Marine.

Further measures to strengthen the EPC in the real estate market are recorded in the National Energy and Climate Plan (NECP) as one of the means for Cyprus to meet the 2030 climate targets and the vision of a decarbonised building stock by 2050. These measures are the revision of the existing legislative framework for the sale and rental of buildings and further linking the EPC to financial and fiscal incentives.

It is also important to ensure the quality of the EPC in order to be considered by building owners as a tool to determine the energy saving and RES measures to be implemented in a renovation. To this end, the Energy Service carries out sample checks and targeted audits of EPCs issued. In 2023, Designated Inspectors of the Energy Service inspected 550 buildings and building units, for the purposes of verifying EPC data and complying with minimum energy performance requirements.

It is also important to modernise the way EPCs are issued in order to keep it in line with new measures and policies and with technological developments. The Ministry of Merchant Shipping (MEEB) revised the building energy efficiency calculation methodology used for issuing EPCs. The project started in December 2018 with the signature of a contract with the University of Cyprus and ended in 2020. The revised methodology was developed on the basis of new standards prepared by the European Committee for Standardisation (CEN) under mandate M/480 of the European Commission and Directive 2010/31/EE and its amendment, Directive (EU) 2018/844. The aim was to fill problems and gaps observed by the application of the previous methodology, to include new technologies and to improve the way the energy condition of the building is recorded in the EPC and its accompanying recommendations. This improvement is expected to lead to greater energy savings, as the EPC is used as an indicator of compliance with minimum energy performance requirements in major renovations, but also of achieving savings in financial and other incentives.

The completion of the new NPRAC in 2020 enabled the Ministry of Mercantile Marine to conclude, in December 2022, a contract for the creation of software simulating it. Among the objectives of the new software is to be operational, pleasant and user-friendly and to provide automated functionalities to reduce computing time. It will also be compatible with all widely used operating systems.

Finally, in the context of the recast Directive and the implementation of the new MYREK simulation software, the format of the EPC document and the accompanying recommendations will be redesigned.

4.1.3 Inspection of heating and air-conditioning systems

The mandatory periodic inspection of air conditioning and heating systems is yet another measure that can contribute towards the energy upgrading of existing buildings. The inspection of air-conditioning and heating systems aims to improve the energy efficiency of the systems through the proposals submitted by the inspector.

Inspection of air conditioning systems is carried out by air conditioning system inspectors, and inspection of heating systems is carried out by heating system inspectors. In any case, the inspector delivers an inspection report to the building owner, which records the inspector's proposals for improving the performance of the system and/or part thereof.

By 2023, 73 heat system inspectors had been certified by the Energy Service approved by the Energy Service, of which 17 were suspended for failure to attend the training by Frederick University, as mentioned below. In addition, 72 air conditioning system inspectors were certified, of which 16 were suspended for the same reason. Finally, by 2023, 346 inspections of heating systems and 336 inspections of air-conditioning systems have been carried out.

The Energy Performance of Buildings Act sets out the obligation to regularly inspect systems with a rated output of more than 70 kW. However, less powerful systems may also be inspected optionally, in particular heating systems with a boiler capacity of more than 20 kW for heating and air-conditioning of over 12 kW. Inspections may not be carried out in the case of systems covered by an energy performance contract or an agreed energy performance criterion or operated by an operator or network operator and therefore subject to measures to monitor their performance, but also in the case of systems which, irrespective of their effective rated output, have been equipped with automation and control systems which enable:

1. The continuous monitoring, recording, analysis and adaptability of energy consumption.
2. Benchmarking the energy performance of the building, identifying losses in the efficiency of the technical building systems and informing the person responsible for the installations or technical building management of the potential for energy efficiency improvement.
3. Communication with interconnected technical building systems and other devices within the building and interoperability with technical building systems of different regulated technologies, mechanisms or manufacturers.

The above alternatives essentially recognise that inspections can be replaced by electronic monitoring of the operation of the system and under certain conditions by energy audits and energy providers. The application of alternative measures to inspections gives more flexibility to building owners to implement the best case by case measure.

It should be noted that the Law since 2020 has extended the scope of inspections to all heating systems (and not only boiler heating systems as they were before) and ventilation systems, provided that they are combined with heating and air-conditioning systems.

With a view to modernising and improving inspections, the method of inspecting heating and air-conditioning systems was revised in 2020 on the basis of new standards adopted by the European Committee for Standardisation (CEN). A new guide on the inspection of heating and air-conditioning systems has been issued, including but not limited to:

1. The quantities measured.
2. The instruments used in the process of inspecting the ventilation heating/air-conditioning/cooling system (exhaust gas analyser, thermometers – thermometers, electrical energy analysers, water meter, water meters, pressure measuring instruments, airspeed measuring instruments, bypass, air quality measuring instrument, refrigerant leakage control instruments) and reference to their calibration requirements.
3. Description of the technical details for calculating the seasonal energy performance ratio (SEER, SCOP) for each system to be inspected.
4. A revised system inspection report, which records the energy saving measures proposed by the air-conditioning/heating system inspector with a quantification of the energy

savings that can be achieved by implementing these measures.

5. Assess the efficiency and size of the heating/air-conditioning/cooling generator in relation to the cooling/heating needs of the building and estimate the size.
6. The potential to optimise the efficiency of the cooling/heating/air-conditioning system or a combination of the cooling/heating/air-conditioning and ventilation/ventilation system under typical or average operating conditions.

The Energy Service awarded to Frederick University the training of those registered in the Registers of Heating Systems Inspectors and Air Conditioning Systems Inspectors on the new method of inspecting heating and air-conditioning systems with or without ventilation. Attendance of the training programme was mandatory for those wishing to remain registered in the respective registers, so that they could continue to carry out inspections. A total of 78 heat system inspectors and air conditioning system inspectors were trained.

4.1.4 requirements for technical systems in existing buildings

In order to further improve the energy efficiency of heating and air-conditioning systems in existing buildings, the periodic audit, regulation and operation of these systems was legislated in 2015 and 2013 respectively. Two guides issued for each system described the work and checks to be carried out by technical system installers. The aim was to ensure that appropriate maintenance measures were in place for heating and air-conditioning systems to operate in the best possible energy efficiency.

In addition, for new systems installed in existing buildings and for existing systems being upgraded, energy efficiency requirements were set in 2016 and related guides were issued. Implementation of the requirements is compulsory to the extent that it is technically, functionally and economically feasible.

In 2022, the above guides were replaced by the ‘Guide to total performance requirements for technical systems installed or upgraded in buildings and building units used as residences, and in buildings and building units which are not used as residential buildings’ and the ‘Guide to Regulation and Control of Technical Building Systems’.
The systems covered by the Requirements Guide are:

1. Heating systems.
2. Cooling systems.
3. Ventilation systems.
4. Built-in lighting systems.
5. Renewable energy systems.

6. Automatic building control systems.

The systems covered by the Regulation and Control Guide are:
1. Liquid and gaseous fuel boilers with similar operating systems.
2. Underfloor Heating.
3. Air-conditioning systems.

4.1.5 Energy Audit and Energy Efficiency Contracts

The energy audit in buildings, carried out by licensed energy auditors, offers a more holistic approach than that provided by the three other independent experts in the field of energy performance of buildings (specialised experts, air conditioning system inspectors and heating system inspectors), as it must be based on up-to-date and measurable operational data on energy consumption in the building and include a detailed overview of the characteristics of this consumption. The training and authorisation of energy auditors started in the second half of 2013.

The periodic energy audit is mandatory for non-small and medium-sized enterprises (non-SMEs) every four years. At the same time, energy audits are promoted through grant plans that operate to implement energy upgrading investments in local authorities, legal persons governed by public law and small and medium-sized enterprises (SMEs).

In April 2014, the Regulations on Energy Service Providers (RSPs) were adopted in order to increase confidence among stakeholders in energy audits, but also to offer an alternative way of financing energy saving measures resulting from the energy audit through Energy Efficiency Contracts (EPCs).

To date, there are 79 Energy Auditors and 10 RUs who can be active in the buildings sector. However, the activity of RUs is at very low levels. This may be due to a lack of confidence on the part of end users in the process and to a lack of know-how and experience on the part of ESPs. Given the relatively small market and lack of access to finance, the development of the energy services market remains frozen. The JRC report, 'Report on the current status of the energy services market and proposals for measures to promote EPC in the public and private sector', lists the obstacles to the development of energy services. These are broken down into the following themes: information and awareness-raising, institutional and legislative, economic, external, technical and administrative, and behaviour. Table 06 shows the obstacles referred to in the GIZ study "An energy efficiency strategy for Cyprus up to 2020, 2030 and 2050", which were mentioned in the year (2017) as the most essential to be resolved as a matter of priority.

Information and awareness raising	Institutional and legislative	Economics	Exogenous factors	Technical and administrative	Behaviour
1. Absence of successful applications. 2. Limited information to customers about RUs and the IGS model. 3. Limited information on funding opportunities. 4. Underestimating the benefits of improving energy efficiency.	1. Public procurement rules. 2. Legislation creating adverse conditions for energy efficiency. 3. Lack of certification mechanisms for RUs.	1. Difficult access to finance. 2. Restricting the availability of funds or making them available at high interest rates by the banking sector. 3. The contractual funding rules are not the same as the IGS model. 4. Lack of financial sector experience in financing through IGS.	1. Low energy prices. 2. High risk/complexity in relation to other investment options. 3. The projects available on the market are usually small-scale. 4. There are many buildings that are rented or have many co-owners.	1. Complex administrative procedures. 2. High transaction costs. 3. Complexity in verifying future savings. 4. Lack of knowledge and experience in IGS projects.	1. Customers' reluctance to take on a risk arising from the application of an IGS. 2. Low trust in RUs. 3. Preference for solutions through the organisation. 4. Reluctance to engage in long-term lending.

PINAKA 4.2: EBARRIERS TO THE IMPLEMENTATION OF ENERGY SERVICES [16]

In order to overcome the obstacles referred to above, the following measures are ongoing:

1. Development of methodology and software for quality control of energy audits. The measure aims to increase and better target the quality control which in turn will improve market confidence in energy audits and thus in the IGSs based on them.

16 GIZ (2017), An energy efficiency strategy for Cyprus up to 2020, 2030 and 2050

2. Implementation of web services for the electronic management of all registers maintained by the Energy Service, including registers of energy auditors and energy service providers. The aim is to speed up administrative procedures and make companies and other organisations interested in the market for energy audits and WS easily accessible.
3. Preparation of standard tender documents for the selection of energy service providers with a view to the conclusion of Energy Efficiency Contracts by the public sector and the wider public sector. The aim is to create standard documents, along with a short step by step procedure, which will then be communicated to the authorities, both the central government and the wider public sector, in order to facilitate the implementation of such projects. The documents are expected to help increase the use of Energy Service Providers for the implementation of energy efficiency projects in the public sector.
4. Finding and promoting ways and structures aimed at facilitating access to funding for Energy Service Providers (RSPs), which should result in facilitating the implementation of energy efficiency projects.

More information on the measures promoted to remove regulatory and non-regulatory barriers to energy performance contracting and energy performance service models is provided in chapter 3.2.iii of the NECP

4.1.6 Energy efficiency obligation scheme

The energy efficiency obligation scheme is a legislative mechanism that sets requirements on energy distributors, designated as obligated parties, to achieve part of the national mandatory cumulative end-use energy savings target. The Debt Parties shall be determined by means of a Ministerial Decree issued on an annual basis allocating the annual cumulative target, on the basis of updated official energy sales statistics.

According to the national planning, as reflected in the NECP, the energy efficiency scheme will contribute to the 2030 national mandatory target of 28.7 % or about 100 thousand tonnes of oil equivalent (ktoe).

The energy efficiency obligation scheme includes measures that the obligated parties should implement with a view to improving energy efficiency in residential, commercial and industrial installations as well as in vehicles. More specifically, the measures are divided into awareness-raising and technical measures. Awareness raising measures concern actions for behavioural change and rational use of energy by final consumers, while technical measures concern intrusive work such as thermal insulation of a building envelope, replacement of technical systems, etc.

The application of the energy distributor obligation scheme is estimated to lead to investments of EUR 2 020 million for the period 2030-150, but not all of them concern the building sector. More details on the Energy Efficiency Obligation Scheme are set out in Chapter 3.2 and Annex 4 of the NECP.

4.1.7 Seismic upgrading of buildings

In the most many buildings built when there were no minimum energy performance requirements, there were at the same time no seismic safety requirements. As a result, the vast majority of existing buildings are insufficient, both in terms of energy efficiency, but also in terms of seismic resistance. The combination of the two is two-way, as a static upgrade of the building will trigger its energy upgrade, while a renovation to improve the energy performance of the building can highlight the building's insufficient earthquake proofing.

In accordance with the Law regulating the energy performance of buildings, for the purposes of addressing issues related to intense seismic activity, before major renovation, the owner of a building or building unit whose building permit was issued before 1994 must appoint an appropriate designer to prepare an evaluation report of the underlying organisation in accordance with the Eurocodes in force regarding the condition of the static operator of the

building and its calculated remaining lifetime, accompanied by any recommendations regarding its structural reinforcement. This provision was developed following a public consultation of interested parties. It is intended to provide appropriate information to the owner of the building at the appropriate time, allowing for a more technically and financially comprehensive planning.

4.1.8 Buildings of a special nature

In Cyprus, there are around 7.250 buildings designated as conservation or ancient monuments in 2024. However, this number has a small but gradual increase, with around 70 buildings per year classified as conserved, with an average of 300 of them renovated per year.

In order to make the best possible use of the energy saving potential of buildings designated as conservation or ancient monuments, the latest amendment to the Energy Performance of Buildings Regulation Law, which was made in 2020:

1. The possibility of exempting such buildings from the issuing of an EPC at the time of sale or rental shall cease to apply.
2. Non-application of the minimum energy performance requirements shall be possible only after there is sufficient evidence that it alters its character or appearance in an unacceptable manner.

This change in the legislative framework aims to increase energy efficiency measures in preserved buildings through energy certification, but also to encourage those involved in such renovations to find technical solutions that will improve the energy performance of the building without breaching its character.

4.1.9 Amendment to the Roads and Buildings Regulation Act on the installation of photovoltaic systems

With an amendment to the Roads and Buildings Regulation Act in 2023 (N.60 (I)/2023) photovoltaic systems installed on the envelope of an existing building belonging to an owner shall not be considered as fittings to a building and shall not require a permit to be issued by the competent building authority. The proposed regulation was deemed necessary in order to cut red tape and speed up the process of installing photovoltaic systems in buildings.

4.1.10 Electric vehicle recharging stations in buildings

Electric vehicles will play a key role in reducing greenhouse gas emissions, further absorbing energy from RES and optimising the efficiency of the electricity system by giving it flexibility, balancing and storage possibilities. It is of the utmost importance to have charging points in

buildings, in particular in homes and workplaces, as electric vehicles are parked regularly and for long periods of time. The installation of recharging points with smart charging functionalities offers the possibility for buildings to store energy and integrate the energy system.

In line with Directive 2014/94/EU on the deployment of alternative fuels infrastructure and with the EPBD, minimum requirements for the installation and provision of recharging points in buildings have been included in the amendment to the Energy Performance of Buildings Act made in 2020. For existing residential buildings with more than two parking spaces undergoing major renovation, ducting infrastructure should be installed for each parking space in order to enable the installation of recharging points at a later stage. In non-residential buildings with more than ten car parks undergoing major renovation, at least one recharging point should be installed, as well as ducting infrastructure for at least one parking space per five, in order to enable the installation of recharging points at a later stage. In addition, in non-residential buildings with more than twenty parking spaces, at least one recharging point must be installed by 1 January 2025.

In addition, to support and promote electromobility, the Energy Agency through the RES and Energy Fund in 2020 launched for the first time a sponsorship plan (see Chapter 4.2.1) aimed at providing financial incentives in the form of government sponsorship for the installation/extension of a photovoltaic system, a recharging point and a smart electricity meter.

In addition, for the development of recharging infrastructure for electric vehicles, the Department of Electrical and Mechanical Services of the Ministry of Transport, Communications and Works has included in the National Recovery and Resilience Plan, in the Policy Axis 'Rapid Transition to a Green Economy – Sustainable Transport', the Allowances Plan 'Electromobility with 1000'. The Plan has a total budget of EUR 3.700.000 and aims to provide aid for the installation of 1000 recharging stations for electric vehicles. Eligible locations are parking spaces for public use such as municipal and community car parks, private parking spaces (e.g. multi-shop parking, hotels, supermarkets, banks, private hospitals, shopping centres, etc.), oil station spaces, recharging stations, and roadside parking spaces (on street parking or along the road).

The Distribution System Operator (DSO) estimates that the 'Electromobility with 1000' plan will meet the needs of electro-mobility by 2030 and that the connection of publicly accessible recharging points is expected to require around 130 new distribution substations, while at the same time responding to the increased demand for electricity, which will result mainly from recharging points for electric vehicles, it includes in the design of the Electricity Vehicle Load Management System.

4.2 incentives

The inability to obtain financing for renovation is, according to the questionnaire answered by stakeholders during the public consultation, the biggest obstacle to the energy upgrading of buildings (Annex II.G). They also consider state sponsorship plans as the most important tool to increase energy renovations.

Incentives are intended to alleviate this obstacle. However, the success of the incentives is largely determined by the savings achieved. According to the Energy Performance of Buildings Regulation Law, financial measures for energy efficiency improvements in building renovation must be linked to targeted or achieved savings as determined by one or a combination of the following criteria:

1. The energy efficiency of the equipment or material used for the renovation, where the equipment or material used for the renovation must be installed by an installer with an appropriate level of certification or qualification.
2. By comparing energy performance certificates before and after the renovation of the building.
3. With the results of the energy audit.
4. Using standard values for the calculation of energy savings.
5. Using another method relevant to the above analogous and transparent methods.

The above criteria apply to financial incentives, such as the 'Save – Upgrading' projects and Order 1 of 2020 of the Minister for the Interior, which are listed in points 4.2.2 and 4.2.4 respectively.

Table 07 summarises all investments per sponsorship project in the buildings sector.

N/A	TYPE OF INVESTMENT		Save – Upgrade in **dwellings**		Save – Upgrade to **businesses** and other actors	For energy upgrading by ATA and wider public bodies	To encourage the use of RES and EPE in **dwellings**	To replace energy-intensive electrical appliances in **homes** of vulnerable consumers	For solar hot water systems in **dwellings**		For charging an electric or hybrid plug-in vehicle in **dwellings**
1	Thermal insulation of a shell (roof, masonry, exposed floors, etc.)						(ceiling only)				
2	Replacement of frames (and exterior shading of shades for dwellings only)										
3	Installation of solar water heaters (solar panels and hot-water cylinder)										
4	Installation of a solar system for the production of hot water or steam										
5	Installation of a solar system for space heating/cooling										
6	Installation of a stand-alone air conditioner										
7	Heat pump installation (geothermal, aerothermal, hydrothermal)										
8	Installation of a photovoltaic system										
9	Battery installation for photovoltaic system										
10	Installation of charger										
11	Conversion of a single-phase to three-phase household electrical installation										
12	Installation of a high-efficiency boiler										
13	Costs of services (energy audits and issuance of EPC)										
14	Replacement of energy-intensive electrical appliances (air conditioners, washing machines,										
15	Replacement of maintenance/product storage refrigerators										
16	Installation of building automation and control system										
17	Installation of external removable shading of shades										
18	Thermal insulation of hot water pipes										
19	Installation of a heat recovery system										
20	Installation of a high-efficiency combined heat and power system										
21	Installation of power factor correction and voltage optimisation systems										
22	Installation of mature energy-saving technologies in the production process.										
23	Replacement of engines, water pumps, circulators and compressors										
24	Replacement of water pumps in water supply, irrigation and/or sewage networks										
25	Replacement of ground or swimming pools irrigation pumps										
26	Replacement of public and building lighting lamps with LED lamps										
27	Replacement of headlamps in sports stages/facilities										

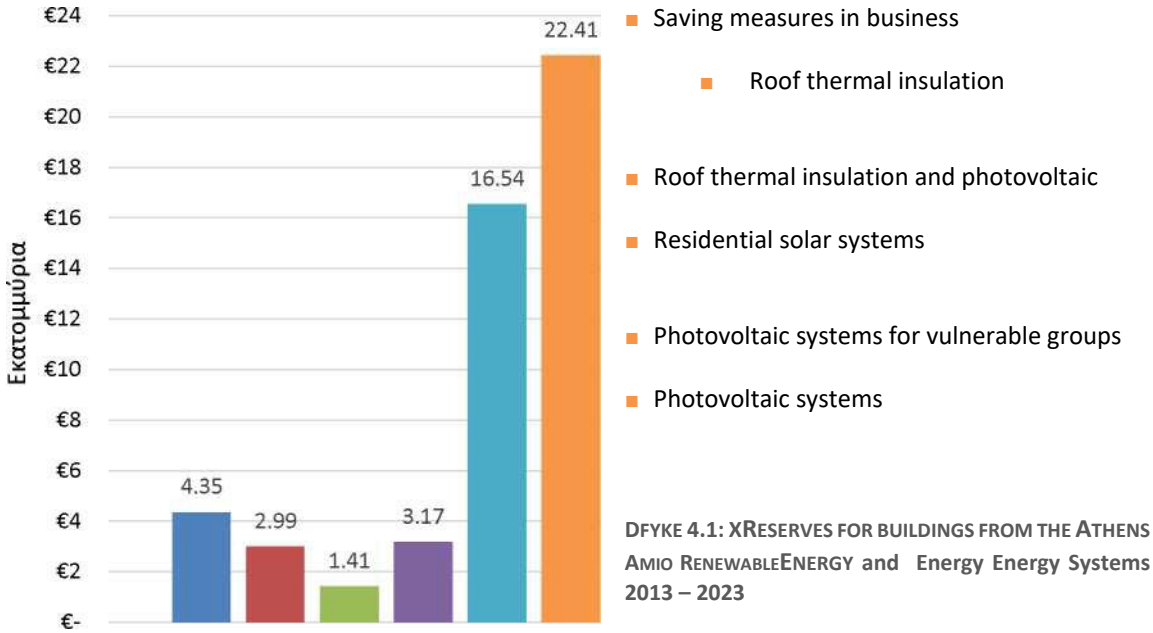
ΠΙΝΑΚΑ 4.3: ΚΑΤΗΓΟΡΙΕΣ ΠΑΡΕΜΒΑΣΕΩΝ ΑΝΑ ΕΡΓΟ ΕΠΙΔΟΤΗΣΗΣ

4.2.1 projects of the Renewable Energy Fund (RES) and Energy Savings (ES)

The RES and Energy Fund was established in 2003 and is the Republic of Cyprus's main financial instrument for the promotion of RES and energy savings, with a view to achieving the binding targets of the Republic of Cyprus, as laid down in the legislation and the relevant European Directives. The revenues of the Fund come from the imposition of an energy charge per kilowatt-hour for the consumption of electricity to all end-users. Since February 2004, when the Fund's grant schemes were launched, by the end of 2023 a total of EUR 393.320.223 was allocated to households, businesses and the public sector for investments in energy efficiency and RES measures. It is estimated that EUR 142.165.221 of the expenditure for the period 2004 – 2023 was granted as a subsidy to the building sector, to investments such as thermal insulation, windows and installation of RES systems for air conditioning and heating.

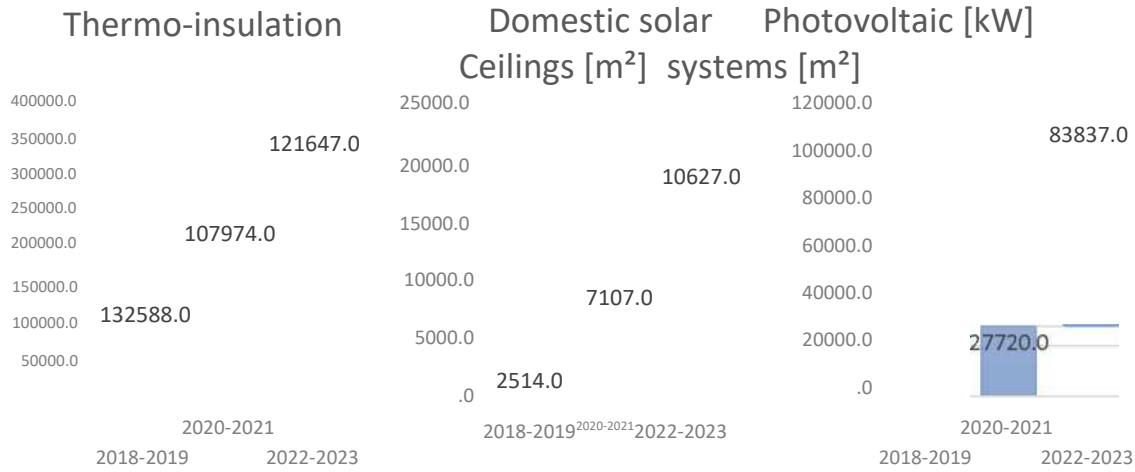
Since 2008, when the minimum energy performance requirements became applicable, the Fund has continued to only grant measures to existing buildings and RES systems for heating and cooling in new and existing buildings.

Chart 05 shows the types of investment in the projects together with the amount of grants for buildings by category, totalling more than EUR 50 million for the period 2013 to 2023.



DFYKE 4.1: XRESERVES FOR BUILDINGS FROM THE ATHENS AMIO RENEWABLEENERGY and Energy Energy Systems 2013 – 2023

The Fund's most important investments in the building sector include the installation of photovoltaic, solar water heating systems and roof thermal insulation. A summary of the installations financed by the Plans for the period 2018 to 2023 is shown in Figure 06, which clearly shows their significant contribution to meeting the national targets for saving energy and increasing the penetration of RES into consumption.



DFYKE 4.2: FOR THE period 2018 TO 2023 PER CATEGORY.

Below is a description of the existing Resource Plans of the RES and Energy Fund concerning the buildings sector.

1. **<u>Grants plan to encourage the use of renewable energy sources and energy saving in dwellings.</u>**

The Plan aims to provide financial incentives, in the form of government sponsorship, to encourage the use of RES and implement energy-saving measures in existing residential buildings and help tackle energy poverty. In addition, the Plan promotes the implementation of actions included in the National Development Strategy for Mountain Communities (ESAOK).

The main objective of the Plan, together with the 'Allowances plan for the installation or replacement of solar hot water systems in dwellings', is to achieve a reduction in primary energy consumption of at least 30 % on average from all supported dwellings under the two plans.

The Plan for the period 2025 – 2026 has a total budget of EUR 90.000.000 and is included in the Cyprus Recovery and Resilience Plan (RRP) for the period 2021 – 2026. It will be financed by the Recovery and Resilience Facility (RRF) of the European Union and its implementation body is the Management Committee for the RES and EXE Fund.

In summary, the Plan for the period 2025-2026 includes five categories of investment grants and provides for a lump sum bonus of EUR 750 if both types of investment (photovoltaic and roof thermal insulation) are implemented in the same house. The categories are:

Category A1 – Photovoltaic – General category:
Installation of a Net Metering or Virtual Net Metering photovoltaic system in an existing dwelling, with a grant of EUR 375 per installed kW PV with a maximum grant amount of EUR 1500. For mountain areas, the grant amount is increased by 50 %. In the corresponding category (category 3A) of the Plan 2022 – 2023, 18.218 applications were submitted. The relevant category is advertised each year from 2019 and a total funding of EUR 2023 has been allocated until 22.413.889.

Category A2 – Photovoltaic – Heavy Households:
Installation of a Net Metering or Virtual Net Metering photovoltaic system in an existing residence of a vulnerable energy consumer, with a grant of EUR 1250 per installed kW PV with a maximum grant amount of EUR 6250. In the corresponding category (category 3B) of the Plan 2022 – 2023, 5734 requests were submitted (of which 3122 were pre-approved), while 2163 completed the investment and submitted related requests for sponsorship. The relevant category is advertised each year from 2013 and a total funding of EUR 2023 has been allocated until 15.273.728.

Category A3 – Photovoltaic for all:
Installation of a Net Metering or Virtual Net Metering photovoltaic system for all, with a grant of EUR 250 per kW and a maximum grant amount of EUR 1000 (4 kW) and, in addition, repayment of an investment of EUR 1000 per kW with a maximum 'repayment amount' of EUR 4000. Initially, the category will apply until the final submission of 6000 applications.
Category B1 – Roll thermal insulation – General category:
Thermal insulation of the existing housing ceiling, with a grant of 50 % of the eligible costs of each application, with a maximum grant amount per application of EUR 2.500 and/or EUR 25,00 per m^2. For mountain areas, the grant amount is increased by 50 %. In the corresponding category (category 1) of the Plan 2022 – 2023, 698 applications were submitted.

Category B2 – Thermal insulation of the roof – Vulnerable Households:
Thermal insulation of the existing housing of a vulnerable household, with a grant of 75 %

of the eligible costs of each application, with a maximum grant amount per application of EUR 3.750 and/or EUR 37,50 per m².

2. Grant plans for installation/replacement of solar hot water systems in dwellings.

The Plan aims to provide financial incentives, in the form of government sponsorship, for the installation or replacement of solar hot water systems in existing dwellings.

In addition, the revised plans promoted the implementation of actions included in the ESAOK by doubling the grant to houses within mountainous areas.

Between 2018 and July 2024, 7294 applications have been sponsored, with an average of 2.75 m² of solar frames. In the 2023 Plan, 3000 applications were submitted, exhausting the total amount of funding of EUR 2.000.000.

Projects are being launched each year from 2005 and a total of EUR 2023 has been allocated until 13.201.945.

3. Grant plan for the installation/extension of a photovoltaic system for charging an electric vehicle or a hybrid plug-in vehicle.

The Plan is implemented in the context of the Cyprus Recovery and Resilience Plan (RRP) and specifically the Policy Axis 'Rapid Transition to a Green Economy', under the Measure 'Building infrastructure for electro-mobility'. The project budget is EUR 1.500.000 and its implementing body is the Management Committee for the RES and EXE Fund. The Plan will remain open until 20/12/2024 or until the available budget is exhausted, whichever occurs first.
With the aim of ensuring that RES penetrate transport as quickly as possible, the Plan aims to provide financial incentives, in the form of government sponsorship, for the installation (or extension of an existing) photovoltaic system, with a view to charging an electric vehicle or a hybrid plug-in vehicle. In addition, the Plan seeks to collect information on the charging profile of electric and/or plug-in hybrid vehicles in Cyprus. By 1/1/2024, 243 applications were submitted, with a total requested funding amount of EUR 41.300. In the corresponding 2020 Plan, 6 applications were submitted, with a total amount of funding of EUR 9634 from the Renewable Energy Energy Fund (RES).

4. A sponsorship plan to replace energy-intensive electrical appliances in homes of vulnerable electricity consumers.

The Allowances Plan aimed at providing financial incentives, in the form of government sponsorship, for the implementation of EPE measures, in particular the replacement of

energy-intensive electrical appliances in homes of vulnerable electricity consumers.

In addition to energy savings, the specific objectives of the project were to inform and raise public awareness of endurance electrical appliances and to familiarise them with the energy labelling of electrical appliances.

The Plan benefited 2660 applicants for a total amount of funding of EUR 2.996.271.

4.2.2 'Save – Upgrade' projects

The programme finances renovations of dwellings and buildings owned or used by SMEs or non-profit-making organisations (NGOs) for which an application for planning or building permits has been submitted before 21^{December} 2007.

The plan provides financial support for a package of measures that will upgrade the building to a minimum level of increased energy efficiency. Eligible costs include thermal insulation of the envelope, windows, high-efficiency technical systems, lighting and RES for heating, cooling and hot water. A larger subsidy is granted to buildings renovated to NZEBs and to homes of vulnerable consumers.

Save – Upgrade in Business

The first call of the project (2014 – 2016) was co-financed by the Republic of Cyprus and the EU European Regional Development Fund under the Operational Programme "Competitiveness and Sustainable Development" 2014 – 2020.

Its second call (2022 – 2023) was implemented under the 'Cyprus in tomorrow' Plan and was funded by the European Union's (EU) Recovery and Resilience Facility, which is the central tool of NextGenerationEU, the temporary instrument to finance the EU's recovery and exit from the crisis caused by the pandemic.

The beneficiaries are the existing SMEs in almost all economic sectors. Investments by specific NGOs not engaged in economic activity are also covered.

Saving – Upgrading in Housing

The Plan aims at large-scale energy upgrading of existing housing by using incentives in the form of non-repayable financial support. The first (2015-2016) and second (2018) project notices with the original name 'Energy Savings/Upgrading in Housing' were co-financed by the Republic of Cyprus and the EU Cohesion Fund under the Operational Programme 2014 – 2020 'Competitiveness and Sustainable Development'.
The success of the first two notices led to the re-launch of the project in 2021 and 2023 under the title 'Save – Upgrading in Housing', under the programme 'T.AEIA' 2021-2027 and co-financed by the European Regional Development Fund (ERDF) and the Recovery and Resilience Facility.

Table 08 presents the most important statistics of the projects.

Year	Project name	Building type [1]	Number of applications submitted	Number of applications approved	Number of building units approved	Number of building units carrying out subsidised investments	Total sponsorship of projects included	Total private investment of projects included	Paid applications	Total amount of payment	Estimated cost of private investment	Average building area	Average selected investment cost	Average annual energy savings (comparing initial with final EPC)	Savings indicator A	Savings indicator B
	Measurement units		**#**	**#**	**#**	**#**	**EUR**	**EUR**	**#**	**EUR**	**EUR**	**m²**	**EUR**	*kWh* year	*kWh* / EUR 000 *investment*	*kWh m²*; year
2014 2016	'Energy Saving/ Upgrading to Business'		165	132	132	118	8.700.000	17.400.000	115	7.226.075	14.452.150	* *	* *	* *	* *	* *
2015 2016	'Energy Savings/Upgrading in Housing' (1th Notice)	K	918	814	814	718	7.473.971	7.649.274	762	6.372.682	6.522.154	157	17.373	48.637	2.800	310
		NZEB	102	87	87	76	1.824.113	829.634	76	1.583.597	720.243	175	30.503	71.734	2.352	410
		KPCI	49	48	45	45	532.301	208.056	45	480.713	187.892	139	14.243	43.614	3.062	313
		CP	10	10	59	59	426.440	331.629	10	303.712	236.187	516	53.990	681.374	12.620	1.321
		Total	**1.079**	**959**	**1.005**	**898**	**10.256.825**	**9.018.593**	**893**	**8.740.704**	**7.666.476**	**N/A**	**N/A**	**N/A**		
2018	'Energy Savings/Upgrading in Housing' (2th Notice)	K	1.061	1.002	1.002	807	9.823.843	10.482.442	807	6.936.228	7.438.646	150	18.178	50.673	2.788	338
		NZEB	75	71	71	55	1.374.145	1.432.176	55	990.380	1.032.204	203	39.526	76.165	1.927	376
		KPCI	88	80	80	65	872.164	486.533	65	672.588	213.722	144	13.797	39.298	2.848	274
		CP	6	3	22	22	167.716	167.715	2	161.959	161.958	1.140	54.366	114.381	2.104	100
		Total	**1.230**	**1.156**	**1.175**	**949**	**12.237.868**	**12.568.866**	**929**	**8.761.155**	**8.846.530**	**N/A**	**N/A**	**N/A**		
2021	'Save – Upgrade in Housing' (1th Notice)	K	1.931	1.925	1.925	919	33.373.454	17.388.632	919	13.093.005	6.821.872	155	28.494	50.280	1.765	323
		NZEB	136	135	135	56	3.944.729	2.296.922	56	1.303.760	759.148	206	46.563	78.866	1.694	383
		KPCI	91	90	90	44	1.856.032	520.311	44	787.280	220.702	157	35.785	51.911	1.451	332
		CP	7	7	65	65	750.543	321.662	2	116.886	50.094	1.043	83.490	198.047	2.372	190
		Total	**2.165**	**2.157**	**2.215**	**1.084**	**39.924.758**	**20.527.527**	**1.021**	**15.300.931**	**7.851.816**	**N/A**	**N/A**	**N/A**		
2021	'Save – Upgrade to British Base Housing' (1th Notice)	K	35	16	16	9	279.140	172.144	9	167.547	103.325	171	26.594	57.820	2.174	338
		NZEB	1	—	—	—	—	—	—	—	—	—	—	—		
		KPCI	2	1	1	1	16.230	3.607	1	16.230	3.607	80	23.186	28.622	1.234	356
		CP	—	—	—	—	—	—	—	—	—	—	—	—		
		Total	**38**	**17**	**17**	**10**	**295.370**	**175.751**	**10**	**183.777**	**106.932**	**N/A**	**N/A**	**N/A**	* *	* *
2022	'Savour-Upgrading in Enterprises and Other Bodies'		296	207	207	1	13.650.000	20.475.000	—	—	—	* *	* *	* *	* *	* *
2023	'Save – Upgrade in Housing' (2th Notice)	K	1.951	* *	* *	—	* *	* *	—	—	—	* *	N/A	* *	* *	* *
		NZEB	476	* *	* *	—	* *	* *	—	—	—	* *	N/A	* *	* *	* *
		KPCI	134	* *	* *	—	* *	* *	—	—	—	* *	N/A	* *	* *	* *
		CP	13	* *	* *	—	* *	* *	—	—	—	* *	N/A	* *	* *	* *
		Total	**2.574**	**2.239**	*** ***	**—**	**45.862.757**	**N/A**	*** ***	*** ***	*** ***	*** ***	**N/A**	*** ***	* *	* *

[1] NZEB: Zero-energy buildings – KPCI: Residential buildings of vulnerable energy consumers – IP: Multi-dwelling buildings – K: Dwellings * * → No data available.
N/A → Not applicable

PINAKA 4.4: INYESTERDAY "IRESTART ASTEP" IN TIME PERIODS

4.2.3 Plan for RES electricity generation for own consumption

Net-metering, net billing and self-generation schemes enable all electricity consumers to meet part or all of their electricity needs through photovoltaic and/or other RES systems.

Photovoltaic systems started to be installed in buildings in 2005, when a project with financial incentives from the RES and ESE Fund was put in place. The first net metering programme started in 2013. Until the end of 2015 it was possible to install a photovoltaic system only in dwellings and with a maximum power of 3 kW. In December 2015, the programme was revised by giving the right of inclusion in the plan to all types of buildings and increasing the maximum power of the photovoltaic system to 5 kW. From 2018 onwards, the permissible maximum power of a photovoltaic system installed by offsetting measurements shall be up to 10.4 kW for premises with a three-phase electrical installation. In single-phase electrical installations, the maximum power of a photovoltaic system shall be up to 4.16 kW.

The plan for the production of electricity from RES for own consumption is the framework for installing RES systems for self-consumption purposes and includes the procedure, terms and conditions for the installation of such a system, in the envelope of new and existing buildings (of all types), as well as on the ground within the parcel where the building is located or on a parcel adjacent to the parcel in which the building is located. The installation of a photovoltaic system for self-consumption purposes shall be carried out in new buildings, with the main aim of meeting the minimum requirement for a share of energy from RES in the total primary energy consumption. In existing buildings, it is done for the purpose of reducing energy costs. In addition, the installation of RES systems for self-consumption purposes in existing buildings, for which the application for a building permit or planning permit was submitted before 1.1.2017, may receive a grant under the Allowance Plan to encourage the use of RES and RES in housing of the RES and Energy Fund or under the 'Save – Upgrade' projects.
The Plan for RES electricity generation for own consumption covers the following investments:

Category A:
Installations of photovoltaic systems using the net metering method, with a power of up to 4.16 kW in buildings with a single-phase electrical installation and 10.4 kW in buildings with a three-phase electrical installation. The beneficiaries of the category are natural or legal persons.

Class B:
Installation of RES systems (photovoltaic systems, biomass/biogas plants, wind turbines, etc.) with a capacity of up to 8 MW using the net billing method. The beneficiaries of the

category are natural or legal persons).

Category C:
Installations of stand-alone RES systems not integrated with the grid, with no limitation on the maximum capacity of each system.

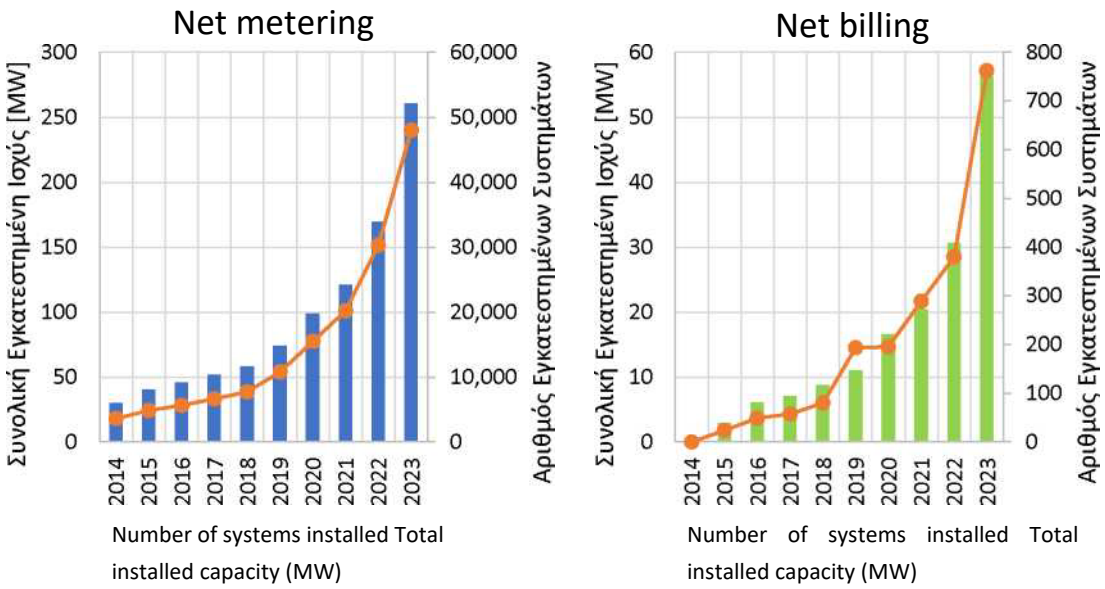
Category D:
Installation of photovoltaic systems connected to the grid using virtual net-metering. Beneficiaries are household consumers, professional farmers and wine-making enterprises (existing or new). The most important difference in this category of systems is that the RES system is installed in a location different from the premises served, unlike the first two categories, where they can only be installed in the shell of legally constructed premises or on the ground within the same parcel where the legal premises and/or adjacent parcels are located with the premises they will serve. The maximum power of each PV system that can be installed is 10.4 kW per consumption account for household consumers and 100 kW per consumption account for professional farmers and wine-making enterprises.

E-Class:
Installations of network-connected photovoltaic systems using virtual net-billing. The beneficiaries are natural or legal persons as well as public and local authorities. The installation space for the systems is the same as category D and the maximum power of each PV system that can be installed is 400 kW per electricity bill per beneficiary. If an energy storage system is installed, the maximum power of each PV system may be up to 1 000 kW. The storage system shall be capable of storage at least 2 hours, based on the nominal power of the converter.

The total capacity of photovoltaic systems installed under the Plan up to December 2023 is shown in Table 09.

Year	PV net metering		PV self-generation and net- billing systems	
	Number of systems installed	Total installed capacity (MW)	Number of systems installed	Total installed capacity (MW)
2014	5.973	17,925	0	0
2015	8.045	24,160	39	1,792
2016	9.135	28,250	81	3,653
2017	10.360	33,213	94	4,276
2018	11.613	38,602	117	5,994
2019	14.780	54,000	147	14,500
2020	19.768	77,403	221	14,653
2021	24.262	100,920	273	21,687
2022	33.970	151,330	409	28,510
2023	52.125	239,980	750	57,140

PINAKA 4.5: THEGLASS OF THE PHOTOVOLTAIC SYSTEMS INSTALLED IN THE FRAMEWORK OF THECHART XSYSTEM, UNTIL DREMITTANCE OF 2023



DFYKE 4.3: INTHE GLASS OF THE PHOTOVOLTAIC SYSTEMS INSTALLED IN THE FRAMEWORK OF THELAST YEAR'SAGE, FOLLOWING THE FOURTHMONTH OF 2023

The above plans play a catalytic role in increasing RES in existing buildings, where their installation either as part of a renovation or as an individual measure is an important element in the effort to decarbonise the building stock.

4.2.4 Order 1 of 2020 of the Minister of Interior

Another incentive is Order No 1 of 2020, as issued by the Minister for Interior on the basis of the Town and Country Planning Law. The mandate was formed by recommendations

from the Energy Service for the revision of Order 1 of 2014. According to the Mandate, new buildings and buildings renovated are given the possibility to increase the building rate by 5 % if they are energy class A and the primary energy consumption per year does not exceed 50 kWh/m², i.e. higher requirements than those set for NZEBs. It should be noted that there is gradually a significant increase in interest in the use of the incentive. In particular, it is reported that in 2023, the Energy Service obtained attestations that the criteria of the Mandate for 1341 deployments were met, compared to 160 in 2018. This certificate is a prerequisite for granting the incentive to the applicant by the planning authority. In 2023, 725 buildings receiving the incentive were inspected by the Energy Service's authorised inspectors. The implementation of Order 1 has been extended until the end of 2024 and the intention of the Energy Service is to renew the measure in order to increase its application to existing buildings.

4.2.5 Reduced VAT rate for residential renovations

According to Interpretative Circular No 199 of the Ministry of Finance, a reduced VAT rate (5 % instead of 19 %) has been applied since 2015 for renovations of dwellings for which at least three years have elapsed since the first date of residence. The reduced rate applies to all savings measures relating to the building envelope, the installation of photovoltaic systems and the upgrading of the stationary building operator. This measure, combined with grant plans such as 'Save – Upgrade' and the RES and Energy Fund projects, help to reduce renovation costs.

4.2.6 Project "Encouraging the reduction of greenhouse gas emissions in enterprises"

The first effort to help businesses take action to reduce carbon emissions was made in 2018 with the Business for Climate – Business4Climate initiative, which was piloted by the Employers' Federation of Industrialists (OEB), in cooperation with the DECCP and the Department of Environment. The initiative provided companies from all economic sectors with the necessary tools to identify greenhouse gas emissions from their activities and set up an Action Plan to reduce them by at least 8 % by 2030. Climate- KIC funding for the implementation of the initiative was completed on 31/12/2018 and 67 enterprises were voluntarily committed. In 2019, it was considered that additional incentives were needed both for the participation of businesses in the initiative and for the implementation of the required actions.

For the mobilisation of businesses, a plan was prepared by the Department of Environment following a decision of the Council of Ministers dated 28/8/2019 (Decision No 88.020). The sponsorship plan 'Encouraging the reduction of greenhouse gas emissions in businesses' was launched for the first time in 2024 and is aimed only at small and medium-sized

enterprises not participating in the greenhouse gas emission trading system. It is financed by the Recovery and Resilience Facility with a budget of EUR 5 million for the first phase where these companies are invited to present an action plan to reduce greenhouse gas emissions by at least 10 % by 2030 compared to the average of the years 2022 and 2023. The second phase of the project aims to finance the investments and its estimated budget is EUR 25 million.

The Sponsorship Plan aims to reduce greenhouse gas emissions from commercial and industrial activity by companies and aims to finance companies that demonstrably reduce greenhouse gas emissions through actions after having recognised their carbon footprint.

Some of the energy saving measures that the companies participating in the project may implement include thermal insulation of the building envelope, replacement of frames, replacement of air-conditioning systems, installation of external shading, installation of a solar system for hot water production, installation of a central solar system for space heating and/or cooling, installation of building automation and energy management systems (BMS/EMS), installation of smart meters, installation of photovoltaics and application of green façade and green roof.

It is estimated that the reduction in emissions resulting from the implementation of the Plan “Encouraging GHG emission reductions in enterprises” for the period 2023-2030 will amount to around 355 kt CO_2 eq, without taking into account that in the future other companies may also be involved.

4.3 Information measures

4.3.1 Public information campaign on energy efficiency

The public information campaign on energy efficiency was carried out between October and December 2023 by the Ministry of Mercantile Marine with national resources. As part of the campaign, four separate information packages were carried out on creating a culture and encouraging citizens to implement zero-cost, low-cost, high-cost energy saving measures and encouraging the use of the Ministry’s grant plans.

The main actions of the campaign were:

1. Promotion of information and information material via the website of the Energy Service and the Ministry of Mercantile Marine.
2. Creation and broadcasting of radio spots.
3. Creation and broadcasting of TV spots.
4. Promotion of information and information material through the social media (Facebook and Twitter) of the Energy Service and the Ministry of Mercantile Marine.
5. Google Ads online ads.

6. Advertisements on information platforms.

The public information campaign by the Ministry of Energy Efficiency is implemented every year.

In addition, advice was published in 2023 on a number of simple energy-saving measures at home and in the workplace.

4.4 Research and innovation in the field of energy efficiency in buildings

According to the NECP, in the effort to reduce carbon emissions, research and innovation can play an important role. Although important technological developments are difficult to implement only by research carried out in Cyprus, a critical mass of researchers on issues such as energy efficiency, renewable energy and fuels can accelerate:

1. The demonstration and development of new technologies in Cyprus.
2. The implementation of innovative measures in the particular circumstances of Cyprus market.
3. Develop expertise for innovative services related to low-carbon technologies.

In particular in the area of energy efficiency of buildings, significant work has been carried out in recent years by universities and other research institutes in the field of energy upgrading of buildings. The Energy Service supports such initiatives, mainly by giving direction to energy policy issues, but also by disseminating results. Moreover, the results of these projects are also used as feedback to improve the existing arrangements and incentives relating to the energy upgrading of existing buildings. Some of these research projects are listed below:

1. The SupERB project, 'Novel integrated approach for seismic and energy upgrading of existing buildings', developed a holistic and innovative methodology for optimal simultaneous seismic and energy upgrading of existing buildings, taking into account economic, technical, geographical and environmental factors. This multi-target genetic algorithm optimisation methodology was integrated into software. The project also proposes guidelines for combined energy and seismic upgrading of existing buildings with filling walls or structural walls, including a regulatory framework. The project (INTEGRATED/0916/0004) was prepared with a contractor at the Cyprus University of Technology and nine cooperating bodies including the Ministry of Energy, Commerce and Industry, and was co-financed by the European Regional Development Fund and the Republic of Cyprus through the Research and Innovation Foundation under the Restart programme 2016-2020. The project was completed in June 2022 for a duration of 42 months.

2. The EBA participated in the European SMEmPower Efficiency Programme, which has the overall objective to support SMEs in the implementation of the European Energy Efficiency Directive 2012/27/EU. In particular, the project builds on a holistic framework that aims to help SMEs improve the skills and competences of their staff by developing specific training programmes for Energy Managers, but also to undergo energy audits and, in particular, to take action and implement the proposed energy saving measures.

As part of the implementation of SMEmPower Efficiency, among other actions, the following have been completed:

(1) Results of a survey of SMEs on the level of energy efficiency.

(2) Certification schemes for energy auditors and energy managers and training sessions provided.

(3) Available financial tools and mechanisms for improving energy efficiency in SMEs at EU level.

(4) Implementation of three training courses for energy managers. These programmes have been approved by the Energy Service as training programmes for energy managers that comply with the provisions of the legislation. The programmes involved 79 people from different industries.

(5) Development of training materials for energy managers as well as specialised energy analysis tools.

(6) Two information workshops with stakeholders.

The training programmes may also be implemented after completion of the project, as they have been included as a postgraduate course of the Department of Mechanical Engineering of the University of Cyprus.

In addition, on the projectportal, www.smempower.com, everyone can find and use free of charge the training manual, the educational platform hosting the educational and training materials used during the courses, the online tools 'Monitoring and Targeting' and 'Measurement and Verification' together with guides and webinars on their use.

The project has started on 1^{September} 2019 and will be completed on 31 December 2022.

3. The Energy Office participates in the "SRI2MARKET" project funded by the EU LIFE programme. The project started in November 2022 and will last 36 months and its main objectives, during its implementation, are:

(1) Support in particular Member States (Austria, Croatia, Cyprus, France, Portugal and Spain) to include the Intelligent Preparedness Index (SRI) of buildings in their national legislation.

(2) Propose public funding plans to finance building upgrades based on the Intelligent Building Preparedness Index.

(3) Develop tools to guide the evaluators of this Index and promote relevant building reviews.

(4) Train energy performance certificate assessors on the Intelligent Building Readiness Index and its calculation methodology.

(5) Design and pilot on the basis of the Intelligent Building Preparedness Index at national

level to identify best practices for relevant evaluations.

(6) Advise building owners and facility managers on cost-effective building upgrades based on the Intelligent Building Readiness Index.

4. Frederick University participates in the EasySRI project (Improving and demonstrating the potential of SRI) funded by the EU LIFE programme. The project started in November 2022 and is expected to be completed on 31 October 2025. EasySRI aims to create an online platform for automated calculation of SRI.The easySRI aims to introduce additional parameters related to energy efficiency and financial dimensions to make the information more understandable for the building user. In addition, easySRI will support the implementation of a range of ML services, which will help assess and assess the intelligibility of the building stock and provide tailor-made recommendations for upgrades, taking into account the cost of the investment. The project seeks to update existing standards, as well as to include its results in new or future standards, and will explore links with other EU initiatives, such as energy performance certificates and digital building identities, in order to maximise the use of SRI.

5. The Smart2 project, funded by the EU LIFE programme, brings together two bodies from Cyprus, Cyric Ltd and Euphyia Tech Ltd.The project aims to develop and deliver the appropriate tools and applications, which will enable the promotion and introduction of a smart building assessment in Europe, through the Smart Building Readiness Index (SRI). Smart2 aims to offer an open platform for assessing building intelligence, adapted for building designers, facility managers and building users. The Smart2 tool will be available in all 24 official EU languages, also taking into account Member States' specificities, with a view to maximising synergies with other EU initiatives. In Smart2, the rate of performance of smart readiness improvements of buildings will be determined, on the basis of existing CEN standards, thus allowing the definition of smart building upgrades at optimal cost, as well as setting the conditions for the development and creation of minimum cost-optimal SRI requirements for new buildings. The project will also develop a SRI screening process, with relevant protocols and procedures, to act as the precursor to a standard procedure. Smart2 SRI certificates will be issued using the open platform, following specific quality standards, allowing visibility and trust in the SRI system.

The Energy Service participates in the advisory committee of these three projects related to the Intelligent Preparedness Index (SRI) of a building.

4.5 new measures and actions

4.5.1 Important new measures from the recast Energy Efficiency (2023/1791/EU) and Energy Performance of Buildings Directives (2024/1275/EU)

The recast EPBD 17 and EED 18 increase the ambition to save energy and reduce the use of fossil fuels in buildings. They include new obligations with the most important ones for existing buildings to be as follows.

4.5.1.1. Minimum energy performance standards for non-residential buildings and trajectories for progressive renovation of the residential building stock

Member States should establish minimum energy performance standards for all existing non-residential buildings. These standards will be based on maximum energy performance thresholds and will aim to lead to the renovation of the worst performing 16 % of the non-residential building stock by 2030 and 26 % by 2033. There will be flexibility to exclude certain categories of buildings, based on an unfavourable cost benefit assessment or due to the type of building and how it is used, such as historic buildings and heritage buildings.

In addition, Member States should adopt a national trajectory to reduce the average primary energy use of the residential building stock by at least 16 % by 2030 and by 20 – 22 % by 2035. It is up to Member States to choose which measures to implement and on which dwellings the measures such as type, year of construction and location will be concentrated. However, the worst performing dwellings, defined as 43 % of the lowest energy efficient residential building stock, should be renovated as a matter of priority. For residential buildings, Member States will have to ensure that at least 55 % of the energy performance improvements are achieved, through the renovation of worst-performing residential buildings, for which usually renovations are most cost-efficient.

4.5.1.2. National Renovation Plan

The submission of a 'National Renovation Plan' to the European Commission in December 2026 will replace the Long-term Building Renovation Strategy. The Plan will include a roadmap for reducing energy consumption for the period up to 2050 and will outline Cyprus' measures and actions to accelerate the pace of renovations and transform our building stock into zero emissions.

17Recast of the European Energy Efficiency of Buildings Directive.
18Recast of the European Energy Efficiency Directive.

4.5.1.3. Creation of one-stop-shops facilitating energy upgrading of buildings

Member States, in cooperation with the competent authorities and, where appropriate, with private actors, should ensure the establishment and operation of technical assistance for energy upgrading of buildings. This should be provided through inclusive one-stop-shops for the energy performance of buildings, for all actors involved in building renovations, including home owners and administrative, financial and economic actors, such as SMEs, including micro-enterprises. In order to comply with the above provisions, the Ministry of Energy, Commerce and Industry implements an online platform that will facilitate the energy upgrading of buildings and include the possibility of applying a renovation passport as described in Chapter 4.5.2.

4.5.1.4. Annual renovation of at least 3 % of the total surface area of buildings owned by public bodies

According to the EED recast, at least 3 % of the total floor area of conditioned buildings owned by public bodies must be renovated each year in order to be transformed into nearly zero or zero-energy buildings. Currently, this obligation only applies to central government buildings and the renovation must aim for the building to comply at least with the minimum energy performance requirements. As a result, the measure will be extended to buildings of the wider public sector, while at the same time increasing the level of energy upgrading required. Alternatively, there is a possibility to apply a renovation passport (BRP), i.e. a planned staged deep renovation, to the same share of buildings, with a view to transforming them into nearly zero-energy buildings by 2040.

4.5.1.5. Energy efficiency targets from the revised EED affecting the building sector

The EED targets for energy savings are set out in Chapter 9. In addition to renovating 3 % of public bodies' buildings as described above, cumulative end-use energy savings are also an important objective to contribute to building renovation. In addition to measures imposed by European legislation, 15.1 % of the target should be achieved by implementing energy efficiency measures for vulnerable, low-income households and consumers affected by energy poverty.

In addition, a number of other mandatory measures are imposed, such as the energy efficiency first for major projects, the prioritisation of vulnerable consumers for energy saving measures, the obligation for companies to have an energy management system or to carry out energy audits based on their energy consumption, the obligation to monitor the energy efficiency of data centres and the promotion of local heating and cooling plans in larger municipalities.

4.5.2 Development of a new digital one stop shop (Doss) online platform for RES and building renovation projects.

In the context of accelerating the energy upgrading of the building stock in Cyprus and the penetration of RES into final consumption, an online platform is being developed to provide support for the implementation of building renovation works and RES projects. The aim is to relieve owners/users of financial, technical and administrative costs by simplifying the required procedures and direct access to services for guidance, financing, implementation, management and maintenance of these projects.

The platform will cover the entire "user journey" from the pre-advisory phase to implementation and maintenance, while attracting building owners, credit institutions, energy service providers, expert experts and installers to the same site, contribute to the growth and competitiveness of the economy, reduce fragmentation in the construction sector and strengthen the local network of specialised renovation companies.
The Platform also plans to implement Building Renovation Passport (BRP) passports that will facilitate better planning/planning of energy renovations (prioritising individual renovation steps) and ensure the most cost-effective implementation of the EPC recommendations.

The digitalisation of the above procedures and needs on a platform will facilitate the future implementation and interconnection of systems such as digital building logbooks, i.e. a database containing all relevant information on the building stock such as cadastral information, town planning, building information management system, energy providers and distributors, building automation system and smart readiness indicators (SRI). (see Chapters 7 and 7.1).

4.5.3 Smart metering infrastructure

Smart metering systems are electronic systems that can measure the amount of electricity to and from the grid and can transmit and receive data for information, monitoring and control purposes. They have the capacity to cooperate with energy management systems and allow building owners and occupants to be immediately informed about their consumption. By providing a clear picture of consumption, they shape the energy behaviour of customers by reducing energy costs and waste.

They can also provide valuable data on the energy performance of a building before and after renovation, helping owners and tenants understand the impact of renovation measures on energy consumption.

In addition to the above advantages for tenants and building owners, these systems will also provide many benefits to the electricity distribution system operator (DSO), such as facilitating the detection of faults and bringing back the supply more quickly. They will also strengthen the analysis and study of the distribution network by providing direct and detailed information on consumption needs, helping to optimise the grid and maximise the penetration of electricity from RES. In addition, they will facilitate the opening and functioning of the electricity market planned in 2025, allowing for the possibility to offer dynamic tariffs.
In accordance with RAEK Decision No 02/2018 (RAA 259/2018) on the implementation of a binding timetable for the massive deployment and operation by the DSO of infrastructure for intelligent metering systems, the overall objective is to install 400.000 smart meters by January 2027. An interim target, according to the Recovery and Resilience Programme, is to deliver 400.000 cash and install 250.000 cash by 30 June 2026. The expected capital expenditure will be EUR 60 million. EUR 35 million from the Recovery and Resilience Fund and the remaining amount needed to implement the project estimated at EUR 25 million will be financed by the Electricity Authority of Cyprus (EAC).

4.5.4 Creation of a National Development Agency

The establishment of a National Development Agency is promoted through the Recovery and Resilience Fund of the Ministry of Finance. The Agency will promote financial tools (loans, guarantees, equity financing, etc.) which will inter alia support investments in energy efficiency projects, mainly in SME buildings. Such a financing tool may also be the on-billscheme, promoted by the Ministry of Finance and the Ministry of Merchant Shipping, to give access to funding to Energy Service Providers (RSPs).

The Agency will not operate with a banking licence and therefore it will not be necessary to capitalise in advance. The funding will come from various sources, such as the European Investment Bank and the State. The processes for its implementation are expected to be completed in 2027 and are monitored by a steering committee with the participation of representatives of the Ministry of Finance and the Ministry of Mercantile Marine.

4.5.5 Increased capital reductions for energy upgrading of enterprises

The amendment to the basic Law on Income Tax (Law 45 (I)/2024) grants an increased capital deduction for expenditure incurred in the tax years 2023 to 2026 inclusive for:

1. improving the energy performance of the building envelope;
2. machinery and equipment related to renewable energy systems and technical energy efficiency improvement systems; and

3. new electric vehicles and recharging stations.

4.5.6 New Single Housing Policy

The new policy includes solutions and measures to increase the production of housing stock and to ensure that housing and apartments are placed on the market and rented or sold at affordable prices that are not prohibitive for the small and medium-sized class. In addition, existing Housing Plans and allowances for rural areas, mountainous, remote, disadvantaged and peripheral areas are being strengthened. In summary, the new single housing policy, in addition to the production of new housing units, aims to incentivise the exploitation of the existing inert stock, which is part of the worst energy efficient building stock, but also to empower vulnerable consumers and especially vulnerable households.

4.5.6.1 Reconstruction and maintenance of refugee multi-apartment buildings ('Building' project)

Following a study demonstrating the static adequacy of refugee multi-apartment buildings carried out in 2020, the Ministry of the Interior will proceed with gradual repair/maintenance of all 358 multi-apartment buildings (3128 apartments) in government housing, with an immediate priority of 43 multi-apartment buildings that have serious static and construction problems, so that they cannot be maintained and need to be restructured. Depending on the static adequacy of the buildings, the extent of the renovation will be determined and whether it falls under a "major renovation" or whether building elements of the envelope will be replaced, it will lead to an energy upgrade of buildings that have the worst energy performance while, at the same time, most of them are occupied by energy vulnerable consumers. The State will also pay the costs to civil engineers members of ETEK to take responsibility for the study and supervision of the projects, while the total cost of the project is expected to exceed EUR 130 million over a decade.

4.5.6.2 Grant Plan 'Renaissance – Rent'

The Plan promotes the granting of financial incentives to improve the quality of the existing inert housing stock and to integrate it into the rental market as an attractive product. The plan does not require any investment in energy savings in buildings, but reinforces in addition incentives for energy upgrades in buildings such as the 'Save and Upgrade' projects of the Ministry of Energy and Industry and the plans for individual energy upgrades of the RES and Energy Fund, and will also cover the issuing of an EPC for the residential unit to be subsidised.

The plan is expected to be announced early in the second half of 2024 and its initial objective is to integrate 1000 inert housing units into the rental market by the end of 2025.

The subsidy concerns costs for the renovation and/or repair of the building unit, which are evidenced by supporting documents and will be accompanied by attractive tax incentives such as an exemption of 100 % from taxation of income from affordable rent, exemption from an extraordinary defence levy and claiming increased capital reductions. The project budget is EUR 25 million and will be financed from national resources. The Cyprus Land Development Agency (KOAO) will act as the implementing body with main responsibilities for preparing and managing the electronic platform from which the project will be implemented, for assessing applications and for carrying out checks and payments.

4.5.7 Emissions trading system in buildings

On the basis of 19 the agreement recently reached in the EU colleges, a new greenhouse gas emission trading system (ETS 2) is established, covering fuels used in buildings, road transport and light industry. This system, which is essentially a carbon tax, will enter into operation in 2027, unless very high oil and gas prices prevail, in which case the implementation of the system will be postponed to 2028. In this system, the European Commission expects prices to be moderate by 2030 (up to EUR 45 per tonne CO_2), so that the prices of heating and motor fuels will not rise by more than 10-15 cents/litre. In any event, and regardless of the international fuel prices applicable at the end of the decade, the implementation of ETS 2 is expected to make energy renovations of buildings even more advantageous, as the market signal that the use of fossil fuels will remain fairly high in the medium and long term, ensuring a low payback period for an energy upgrade. The implementation of ETS 2 will be accompanied by the creation of the Social Climate Fund, a pan-European fund that collects a large part of ETS 2 revenues and redistributes them to households and companies facing high energy costs.

4.5.8 Green tax reform

The European Commission's 2019 and 2020 country-specific recommendations for Cyprus identified weaknesses in Cyprus' development model, with a negative impact on the environment and the climate-neutrality objective. Weaknesses in environmental management focus on three areas: climate change and air pollution, water management and waste management.

In particular, the following are recorded for Cyprus:

1. It is one of the EU Member States with the highest CO2 emissions per capita (11.6 tonnes CO_2/head compared to the EU average of 8.8 tonnes CO_2/head).
2. The transport sector is identified as the most polluting sector with around 50 % of total national emissions.

European Council press19 release: Council adopts key pieces of legislation delivered on 2030 CLImate targets.

3. Total waste generation is among the largest in the EU.
4. The health costs resulting from air pollution amount to around EUR 549 million/year.

Green tax reform is the most important additional policy under consideration for Cyprus to achieve its climate targets by 2030 and to move to a carbon-free economy by 2050.

An important part of the green tax reform is the introduction of a carbon tax on motor and heating fuels. This measure is a commitment of the Republic of Cyprus included in the Recovery and Resilience Plan and you expect its implementation to start as of 2025. Should a national carbon tax be introduced in the sectors to which ETS 2 referred to above will apply, the country is entitled not to apply ETS 2 if the national tax is at least at the same level as the price prevailing in ETS 2.

Therefore, if a national carbon tax is applied in the context of the green tax reform, the market signal that fuel prices will remain relatively high will go even earlier, which will again encourage investment in energy renovations of buildings.

However, the reform will not be permanent but adaptive, as we do not know what kind of fuels will be used in the future.

5. Policies and actions concerning the worst performing segments of the national building stock, conflicting interests dilemmas and contributing to alleviating energy poverty.

Buildings for which an application for planning or building permits was submitted before 21^{December} 2007 are typically the buildings with the lowest energy performance, as there were no minimum energy performance requirements before that date. Recognising that this is also the part of the building stock with the greatest potential for energy savings, the 'Save Upgrade' plans and the thermal insulation plans of the RES and RES Fund focus on the financing of buildings for which an application for planning or building permits was submitted before 21^{December} 2007.

In buildings with low energy performance, it is more difficult to implement an energy upgrade when one or more of the factors mentioned below coexist:

1. The energy end user bears the energy costs but cannot decide to implement energy efficiency improvement measures, as is usually done in rented dwellings and commercial buildings.
2. In a building there is more than one owner or occupant and the consent of all is required for energy upgrading, such as in multi-apartment buildings.

3. The building often changes uses and/or users, either due to its type or location, such as shops located on commercial roads and often changing tenants or dwellings rented on a temporary basis. In such cases the period of use of the building is not long enough or uncertain and does not justify the depreciation of the initial capital expenditure.
4. Households in the range of energy poverty.

The main problems arising from these factors and ways of mitigating them are analysed below.

5.1 Rented buildings and buildings with multiple owners

In a percentage of the building stock, stakeholders are prevented from making energy efficiency investments as the resulting benefits, in part or in full, will not end up in the part that has assumed the initial investment costs.

Occupants and/or apartment owners are a category that represents around 60 % of all dwellings in the building stock and are highly likely to face these challenges. This is mainly due to:

1. The different levels of understanding of the benefits of energy efficiency among co-owners.
2. The different incentives and priorities among co-owners.
3. The different levels of creditworthiness and income between the co-owners.
4. Organisational issues linked to the collective decision-making process.

Rented homes represent 24 % of all homes. The implementation of energy upgrading measures in these homes may be prevented by the fact that the investment cost borne by the building owner results in benefits for the tenant alone. Tertiary sector buildings also face a similar problem. Although data on the commercial sector are insufficient, we know that renting buildings for office, retail and catering uses is a widespread practice in Cyprus.

	Owner	**Rented**	**Other**
Single-family houses	35.9 %	6.9 %	2.9 %
Apartments, dual dwellings, mixed use buildings	33.1 %	17.5 %	3.7 %
Other types of houses	0 %	0.1 %	0 %

PINAKA 5.1: PROPERTYAND RENTAL DWELLINGS

The technical report prepared by the JRC for the Ministry of Commerce and Industry entitled ‘Split incentives and energy efficiency in Cyprus’ analyses the barriers to the energy upgrading of buildings stemming from the existing structure of the real estate market. To overcome the roadblocks, the technical report cites examples of successful policies and measures implemented in other countries, as well as proposals for measures that can be

implemented in Cyprus. The measures proposed are the following:

1. Strengthening the implementation of the role of EPCs by implementing better quality control mechanisms, more severe penalties for those in breach of the relevant legislation and improving the methodology for calculating energy efficiency.
2. Promoting the installation of energy meters in each apartment so that owners have accurate consumption data.
3. The implementation of policies to simplify the decision-making process in the case of buildings owned by multiple owners.
4. Financial incentives specific to multi-apartment buildings and rented buildings.
5. The implementation of voluntary agreements between the owner and the tenant to share the costs and benefits of an energy upgrade.
6. Gradual introduction of minimum energy performance requirements in rented buildings.
7. Certification of building elements installers.

Some of the above measures have already been adopted, such as the revision of the methodology for calculating energy efficiency and the creation of a register of installers of small-scale technical and RES systems. The 'Save – Upgrading' project also tried to address the obstacles to energy upgrades of rented and multi-owner buildings. Buildings that were rented could also be included in the plans. In the case of SMEs, until the last notice of 2023, the SME using the building was the applicant and beneficiary, regardless of whether it was the owner or tenant. In the case of dwellings, until the 2021 notice, rented buildings could also be included, but the application could only be made by the owner. In addition, there was special provision for the inclusion in the project of a multi-apartment building, where the management committee was the applicant and recipient of the grant. However, the participation of such building cases in 'Save – Upgrade' was low. However, in the 2023 notice, dwellings to be used as part of an economic activity were not eligible for a period of at least five (5) years from the date of submission of the application.

In the questionnaire conducted by the Energy Agency (Annex II.G), stakeholders consider that the most effective measures to improve the energy efficiency of rented buildings are to provide financial or other incentives for renting buildings with high energy performance and to set a minimum energy class in the Energy Performance Certificate for buildings rented. However, these require further measures to strengthen the EPC in the real estate market, and any negative consequences, such as an increase in the price of rents, should be assessed.

In addition to the above, there are two other major obstacles to enhancing the renovation process ofbuildings20. The first is the law on rent control. In short, the Act stipulates that

20"Vision of Cyprus Energy and Climate Plan – Task 5.2: Report on inputs and policy elements to update the Cypriot National Long-Term Renovation Strategy' by Trinomics consultant in collaboration with the Cyprus Institute.

the rent of dwellings and offices constructed before 1999, where there is a contract between the owner and the tenant, is regulated and its increase may not exceed a percentage decided by the Council of Ministers. In addition, eviction procedures in such cases must follow a lengthy procedure in accordance with the relevant legislation. It is evident that this creates an additional obstacle to the renovation of an old and energy-inefficient building. It should be noted that rent control and the legal framework for communal properties are of high interest and their modernisation and/or modifications have a variety of political and social implications.

The second obstacle is the problematic legal framework for co-properties and their management committees. Unfortunately, this creates more complexity and explains the low interest of multi-apartment buildings to benefit from energy renovation grants. At present, a draft law entitled 'The Management of Shared Buildings and Related Matters Law of 2023' has been submitted to Parliament in order to improve the legal framework for common properties and to provide solutions to the non-functioning of the Building Management Committees.

5.2 energy poverty

In 2020, 20.9 % of the population reported that they were unable to have a warm house in winter, while 9.2 % were unable to pay their energy bills on time due to financial difficulties21.

To define energy poverty, vulnerable consumers and to define indicators to measure and monitor energy poverty and set targets for reducing energy poverty, technical assistance was received for a study completed in 2024.
According to the Electricity Market Regulation Law of 2021, the definition of vulnerable customers may take into account income levels, the share of energy expenditure of disposable income, the energy efficiency of dwellings, critical dependence on electrical equipment for health reasons, age, geographical location and other criteria. The criteria for defining energy poverty may include low income, high energy expenditure relative to disposable income and low energy efficiency.

On the basis of the Electricity Market Regulation Laws 2021 and 2022, three Decrees have been adopted laying down the criteria for energy poverty, the concept of vulnerable customers and their categories, and the measures to address energy poverty and protect vulnerable electricity customers, as well as a Decision imposing public service obligations

21Turning up the heat on Cyprus's fuel poverty crisis – ESPN Flash Report 2022/21.

concerning the special price of electricity. The new Decrees include broadening the categories of vulnerable customers.

Today, measures to tackle energy poverty and protect vulnerable electricity consumers include:

1. The right to apply for inclusion in the special electricity supply tariff for vulnerable customers, which is about 20 % lower than the household tariff.
2. The measure of non-cut-off connection or re-connection of electricity at critical times for vulnerable consumers for whom uninterrupted electricity supply is necessary for health reasons, subject to the approval of a competent Medical Board, subject to conditions.
3. The provision of financial incentives through their participation in grant projects.

Policies and plans to empower economically vulnerable consumers do not have the expected effect, even if they provide for a higher financial grant. This is mainly due to the lack of financial capacity of these people. In addition, even if a grant is given in advance to vulnerable households/consumers, they should find the remaining amount, usually by applying for a loan, assessed by banks on the basis of their low income, thus making them unreliable for borrowing.

Energy poverty and energy vulnerable households therefore need a focused and tailor-made approach. Energy and social policies are clearly interlinked and should not be treated separately.
In addition, each grant scheme should be designed in such a way that there is minimal and, where possible, no administrative burden. This could be achieved with a specific scheme where the beneficiary would be the contractor offering the energy renovation services with the key in hand to vulnerable households.

6. Policies and actions concerning all public buildings

The exemplary role of public buildings in the field of energy efficiency is underlined by a number of legislative measures. They are.

1. The obligation to renovate 3 % per year of the total surface area of buildings owned or occupied by central government authorities to meet minimum energy performance requirements or to take other measures leading to equivalent energy savings in those buildings.
2. All new public buildings must be NZEB[as] of 1 January 2019, i.e. two years earlier than the other buildings.
3. Central government authorities should purchase and lease only energy-efficient buildings.
4. In public buildings with a useful floor area over 250 m² an EPC must be issued and displayed in a prominent place visible to the public.

In addition to legislative measures, there are other actions aimed at improving the energy performance of public buildings. The following sub-chapters show the most important policies and actions.

6.1 action plan for energy upgrading of buildings owned and occupied by central government

The Energy Efficiency Law provides that 3 % of the total useful area of heated and/or cooled buildings owned and occupied by central government authorities shall be renovated each year in order to meet at least the minimum energy performance requirements set in accordance with the Energy Performance of Buildings Law. Alternatively, other cost-effective measures, including deep renovations and measures to change the behaviour of users in buildings belonging to the assets of central government authorities, may be taken in order to achieve at least equivalent energy savings in the buildings of central government authorities. The annual target was calculated on the assumption that 3 % of the public building stock will be renovated from energy class E to energy class B. The primary energy consumption before and after the renovation is considered to be the one calculated for the typical building, as determined in the calculation of the cost-optimal levels of minimum energy performance requirements. A report has been submitted to the European Commission which reports and quantifies the measures taken.

The annual savings target has been achieved by 100 % in 2014, 103 % in 2015, 91 % in 2016, 94 % in 2017, 86 % in 2018, 89 % in 2019, 153 % in 2020 and 470 % in 2021.

By Decision of the Council of Ministers of 14 April 2016, the Committee for the Upgrading of the Energy Performance of Buildings of the Central Government Authorities was set up. The Committee shall be composed of representatives of the Directors of the Energy Service of the Ministry of Energy of the Ministry of Energy, the Public Works Department, the Department of Electrical and Mechanical Services and the Control Directorate of the Ministry of Transport, Communications and Works (MYEE). It is tasked with planning the implementation of energy saving measures based on technical data and available financial resources.

The same approach will be followed for the period 2021 – 2030, but the annual energy savings target has been recalculated on the basis of changes in the central government building stock.

The following table shows the central government buildings, the total area and energy savings that could be achieved if 3 % of the total area per year were renovated. The annual energy savings target for 2021 – 2030 is 1.31 GWh or 0,11 ktoe (Table 07).

Type of building	**Number of buildings**	**Primary energy before renovation**] Lm ^{2}*year]*	**Primary energy after renovation r-4** ^ 5_i Lm^2*year]*	**Total area** *[m^2]*	**Estimated energy savings** [GWft]
Offices	93	332	177	210.042	32,55
Education buildings	17	96	50	52.200	2,4
Other	41	332	177	57.369	8,89
Total	**151**			**318.831**	**43,85**
Annual energy savings to be achieved to be equivalent to an annual renovation of 3 % of the total surface area					**1,31**

PINAKA 6.1: BUILDINGTHE ENERGY SAVING TARGET IN THE BUILDINGS CONCERNED AND USED BY THE CENTRAL GOVERNMENT

The above savings target is only part of the full energy savings potential that could be achieved in central government buildings. In the theoretical scenario that all buildings owned and occupied by the central government will be renovated to NZEB, the annual energy savings are estimated at 2.2 GWh or 0,189 ktoe (Table 08). The technical and financial aspects of this calculation have not been taken into account, but serve as a reflection on future policy measures in view of the 2050 targets.

Type of building	**Number of buildings**	**Primary energy before renovation**] Lm ^{2}*year]*	**Primary energy after renovation r-4** ^ 5_i Lm^2*year]*	**Total area** *[m^2]*	**Estimated energy savings** [GWft]
Offices	93	332	71	210.042	54,32
Education buildings	17	96	24	52.200	3,76
Other	41	332	71	57.369	14,97

Total	**151**		**318.831**	**73,55**
Annual energy savings that can be achieved by an annual NZEB renovation of 3 % of total surface area				**2,2**

PINAKA 6.2: BUILDINGENERGY SAVINGS BY UPGRADING BUILDINGS OWNED AND USED BY CENTRAL GOVERNMENT TO NZEB

Under the alternative approach, the central government buildings whose energy upgrade was co-financed by Cohesion Policy Funds for the 2014-2020 programming period are:

1. Assembly of Government CMs in Paphos, with an area of 11.000 m² in energy class B +. The project cost EUR 8 million and was completed in 2021.
2. The Commissioners' building, with a surface area of 1 800 m² in energy class B +. The project cost EUR 1.5 million and was completed in 2022.
3. The building of the Central Offices of the Public Works Department, with an area of 7 000 m² in energy category A. The project is ongoing and is estimated to cost EUR 9.3 million.

Although the above projects are financed for the 2014-2020 programming period, they were completed after 2020 and will therefore be taken into account in the 2021-2030 target.

The target for the period 2021 – 2030 is planned to be implemented mainly by the following measures:

1. Deep renovation of the following buildings co-financed by Cohesion Policy Funds for the 2021-2027 programming period:
   (1) Building of the Audit Service.
   (2) Ministry of Finance building.
   (3) Public Service Committee Building.
   (4) Directorate-General for Development building.
   (5) Ministry of Foreign Affairs building.
   (6) Aradippou Police Station Building.
   (7) Agia Napas Police Station Building.
2. Individual measures: Measures identified as cost-optimal, as well as measures that can be combined with maintenance work, will be implemented by the Public Works Department and the Department of Electrical and Mechanical Services and are financed mainly from national resources.
3. Behavioural measures: The Energy Savings Officer appointed to each public building is responsible for recording energy consumption and promoting energy efficiency mainly through behavioural and information measures. It plays a central role in changing the behaviour of civil servants towards a more rational use of energy.

The budget of the alternative approach project for the programming period 2021 – 2027

amounts to EUR 50 million, so there is scope for additional projects to be implemented. This depends on progress in the implementation of ongoing and planned projects managed by the Public Works Department.

In addition to funding from the Cohesion Policy Funds, energy upgrading projects are financed by other resources. The energy upgrade of the Presidential Palace has been awarded and implemented in 2023 under the Greece-Cyprus Cross-Border Programme Interreg V-A 2014 – 2020.

6.2 Energy saving officers (EEB) in public buildings

The institution of LES started to be implemented on a voluntary basis since 2011. Following a decision of the Council of Ministers (Decision No 80.534) in 2016 and following a joint proposal from the Ministry of Merchant Shipping and the Ministry of Mercantile Marine, the Ministry of Merchant Shipping and the Ministry of Mercantile Marine (YEEB) must be designated in all owned and rented public buildings of the Central Public Administration.

In addition, at its meeting on 7/12/2022, the Council of Ministers approved a proposal setting out a series of energy-saving measures and an obligation to designate a LTS in all public buildings (with a simultaneous recommendation for their implementation by the private sector). The responsibility for implementing the measures lies with the relevant heads of public bodies, who should inform the Energy Service on an annual basis.
The FABs are required to monitor and collect data related to energy use in buildings where they have been designated as responsible, and to provide the relevant information to the Energy Service annually. The information is provided by completing a standard electronic form, which records, inter alia, various energy data of the building, such as electricity, oil and/or LPG consumption, electromechanical equipment, RES systems, lighting and others.

According to reports received from LEBs, electricity consumption in public buildings has decreased by 13.23 % in 2022 compared to 2021.

6.3 Rent and purchase of highly energy-efficient buildings by central government

According to Article 15 of the Energy Efficiency Law (31 (I)/2009):

1. Central government authorities shall purchase and lease only highly energy efficient buildings, provided that this is consistent with cost-efficiency and economic feasibility, overall viability, technical suitability as well as sufficient competition. A circular on the subject has been issued by the General Accounting Office (Circular GL/MLA 101 dated 30/6/2017, Annex XI).
2. The competent public procurement authority shall encourage public bodies, when awarding service contracts with a significant energy content, to assess whether it is possible to conclude long-term energy performance contracts which lead to long-term energy savings.

6.4 STRATENERGY project

In the context of the submission of proposals for the Interreg V-A GREECE – CYPRUS Cooperation Programme 2014-2020, the Strategic Cross-Border Cooperation Digitalisation of a Common Approach to Energy Savings in Public Buildings (STRATENERGY) was approved for implementation by the managing authority of the programme. The project concerns the promotion of energy savings in municipalities and organisations in the wider public sector in the cross-border cooperation area of the Programme, by developing tools for use by the above bodies, as well as the implementation of demonstrative energy saving projects. It should be noted that the project is co-financed 85 % by the European Regional Development Fund and 15 % by Greek and Cypriot national resources.

The main objectives of STRATENERGY are to implement mature strategic projects in public buildings, to finalise a common strategic and operational planning framework for public sector bodies for 2030 to integrate energy savings into their building stock and to maximise results through piloting using modern specialised IT applications/decision support methodologies and broadening the common framework in coherence with relevant policies.

As part of the implementation of the project, in Cyprus the municipal centres of the municipalities of Geroskipou, Agios Dometriou, Sotira and a building of the University of Technology in Cyprus were upgraded. The MECI was the main beneficiary of the project with a budget of EUR 1.619 million, while the total project budget for all partners amounts to approximately EUR 4.196 million. The project was completed in December 2023. The Nicosia Development Company (ANEL), the Centre for Renewable Sources of Greece (KEPE), the Region of Crete (PE), the Municipality of Thira, the Municipality of Samos, the Municipality of Kos and the Association of Regions of Greece (ENPE) also participated in the partnership. Information on the energy saving measures implemented in each building in Cyprus, the expected annual energy savings and the category in which the EPC of each building is classified before and after the energy upgrade is given in Table 09.

N/A	Organisation	The building	Energy-saving measures to be implemented	EPC category (before upgrade)	EPC category (after upgrade)	Expected annual EPC primary energy savings in kwh
1	Municipality of Agios Domeiou	Municipal Palace	Roof thermal insulation, replacement of frames, installation of LED lamps replacement of air-conditioning system.	G	B	1.950.280
2	Municipality of Geroskipou	Municipal Palace	Roof thermal insulation, thermal insulation of external walls, replacement of frames, installation of LED lamps, replacement of air-conditioning system.	D	B	170.756

3	Municipality of Sotira	Municipal Palace	Roof thermal insulation, replacement of frames, installation of external shading systems in windows, installation of LED lamps, replacement of air-conditioning system, installation of a photovoltaic system	D	B	500.344
4	CUT	Former building Popular – Limassol	Roof insulation, thermal insulation of external walls, replacement of air-conditioning system, installation of a photovoltaic system	D	B	452.421
Total expected annual EPC primary energy savings in kWh						**3.073.801**

PINAKA 6.3: VALUESTO BE UPGRADED TO KIN THE CONTEXT OF THE IMPLEMENTATION OF THE 'STRATENERGY' PROJECT

6.5 Public schools

The Ministry of Education, Sport and Youth (Ministry of Education, Sport and Youth) has concluded an agreement with the EAC for the installation of photovoltaic measurement systems with a total capacity of 4.88 MW and thermal insulation of roof in public school buildings. The project is expected to contribute to:

1. Saving the financial resources of the State.
2. The production of additional electricity and during the hours of non-operation of schools.
3. Efficient and rational production and consumption of electricity.
4. The achievement of the renewable energy targets set by the European Union towards its Member States.
5. Protecting the environment and reducing emissions of pollutants and greenhouse gases.
6. Fulfilling the harmonising and exemplary role that public buildings should play in the energy sector.
7. Fostering students' energy and environmental awareness and in particular familiarising them with renewable energy technologies.

The agreement has been signed in November 2019 and the projects were completed in 2023. The measure led to the installation of roof thermal insulation with a total surface area of 84.918 m² in 290 schools and photovoltaic with a nominal capacity of 4.881 MW in 405 schools. In order to ensure the smooth monitoring of the proper functioning of all PV systems and their effective management, the EAC proceeded with the installation of software for central monitoring by providing support services for 10 years. The total cost of implementing the project was approximately EUR 6 million.

The Ministry of Rural Development and Food, in cooperation with the Cyprus Energy Office, is also implementing the PEDIA programme (Promoting Energy Efficiency Developing Innovative Approaches in schools), which seeks to transform 25 schools into zero-consumption buildings. The PEDIA project has secured EUR 500.000 funding from the European Commission for Technical Assistance and aims to improve the energy efficiency and comfort conditions of 25 public school buildings in Cyprus, thereby also contributing to

the achievement of Cyprus' national and European energy and climate targets.

More specifically, the Programme, funded by the European Commission and Horizon 2020, will implement holistic solutions relating to thermal insulation of roofs and masonry, the installation of energy-efficient windows, the implementation of shading systems, photovoltaic systems, automation, efficient comfort and ventilation solutions, and the creation of green roofs. The programme, lasting five (5) years (2020 – 2025), aims to change from fragmented temporary and isolated solutions to long-term holistic and permanent approaches, where schools themselves, other than zero-energy buildings, will become an organic part of the school's pedagogical and social functions.

The PEDIA project aims to mobilise at least EUR 7.500.000 of public and private investment and develop a long-term energy renovation strategy for all public school buildings, introducing a procedural framework for energy upgrades, based on environmental, energy and socio-economic criteria. It should be noted that the Ministry of Rural Development and Food itself has committed a budget of EUR 4.500.000 with its own resources, while one of the liabilities of the PEDIA partnership was the actions to obtain further funding. In addition, the Ministry of Rural Development and Food aims to extend the PEDIA programme in order to upgrade a larger number of schools, co-financed by Cohesion Policy Funds (Th.ALEIIA 2021 – 2027).
In March 2022, the Education for Environment and Sustainable Development Unit of the YYEI announced the 25 pilot schools that will be upgraded to NZEB under the PEDIA project.

Work has already been completed on the energy upgrading of the first five schools (Agios Dometriou Gymnasium, Agia Trimithia Primary School, Idali Primary School, Aghadzia Primary School and Agios Antoniou kindergarten), while the start of works for the next five schools (Acropolis Primary School, Stavros Primary School, Agia Anargyrou kindergarten, Clearis Primary School – Dimitris Lipertis and Primary School and Sia kindergarten) is expected to take place in July 2024. In total, it is planned to start work in 11 schools in 2024 and 9 in 2025 with their completion by July 2026.

Theproject is a good practice of a public-private partnership to procure renovation of public buildings. Συγκεκραμένα, το Ενεργειακό Γραφείο ως συντονιστής του έργου, ενέργησε ως Αναθέτουσα Αρχή αναλαμβάνοντας την ανάπτυξη της ιδέας του έργου, τη διεκδίκηση χρηματοδότησης, τη μελέτη, αξιολόγηση και επιλογή των σχολείων, το σχεδιασμό των παρεμβάσεων αλλά και την προκήρυξη, ανάθεση, υλοποίηση, παρακολούθηση και επίβλεψη των δημόσιων συμβάσεων.

6.6 Public Nurses

The Organisation of State Health Services (OKYPY), through its Recovery and Resilience Plan, plans the renovation and energy upgrading of hospitals. Table 10 lists these projects.

N/A	Project/Building	Financial Plan/Programme *	Implementation Horizon
1	**Nicosia Prefecture:** Refurbishment/Extension of Emergency Department	NASP	May 2024
2	**Nicosia Prefecture:** Refurbishment/Extension of a Department of Exploration of Radiology	AR 2022	May 2024
3	**Larnaca Secretariat-General:** Refurbishment/Extension of Emergency Department	NASP	May 2024
4	**Larnaca Secretariat-General:** Renovation/Extension of a Department of Radiology	AR 2022	February 2025
5	**Paphos general hospital:** Refurbishment/Extension of Emergency Department	NASP	May 2024
6	**Paphos general hospital:** Refurbishment/Extension of Daily Nursing	NASP	May 2024
7	**Paphos general hospital:** Refurbishment/Extension of Paediatric/Nursing Unit, Midwifery and Gymnasiological Clinical Clinical and Clinical Prisoners	NASP	May 2024
8	**Limassol Secretariat-General:** Refurbishment/Extension of Emergency Department	NASP	May 2024
9	**Limassol Secretariat-General:** Refurbishment/Upgrading of Lower and Plainery	NASP	June 2026
10	**Archbishop Makariou III Hospital** - Refurbishment/upgrading of a gynaecological clinic - Refurbishment/upgrading of a paediatric surgery clinic	NASP	June 2026

NRRP: National Recovery Plan for Resilience – OP 2022: National Budget 2022

PINAKA 6.4: ENERGYRENOVATIONS BY OKPY

6.7 Grants plan to encourage energy upgrading by local authorities and bodies in the wider public sector.

The Allowances Plan aims to provide financial incentives to encourage the implementation of energy upgrading investments by local authorities (ATA) and legal persons governed by public law (legal persons governed by public law).

The Plan is included in the Cyprus Recovery and Resilience Plan (RRP) and specifically under Policy Axis 2 'Rapid transition to a green economy', under Measure C2.1I3, with set targets up to and including 2026.

The Plan aims in particular to upgrade the existing building infrastructure of the ATA and legal persons governed by public law extensively and to contribute to the achievement of national

RES and energy saving obligations.

The main objective of the Plan is to achieve a reduction in primary energy consumption of at least 30 % on average of all supported investments under the Plan. However, for buildings it is a pre-condition to transform them into NZEBs.

The Plan has been included in RePowerEU and has a total budget of EUR 20.000.000. It is financed by the European Union's Recovery and Resilience Facility (RRF), while its implementing body is the Management Committee for the RES and the Energy Fund.

By 1.1.2024, 53 proposals had been submitted, comprising 47 buildings with a funding request of EUR 14.354.381 and estimated final energy consumption savings of 3 553 679 kWh/yr. By 1.1.2024, 32 had been approved, comprising 30 buildings, with estimated final energy consumption savings of 2 367 285 kWh/yr and an approved financing amount of EUR 8.139.777,40.

7. Promoting digitalisation, smart technologies and well-connected buildings and communities

Promoting smart technologies and well-interconnected buildings and communities is a key pillar for the digitalisation of the energy sector. The main and most important feature of "smart" systems is that they can communicate and exchange information in a digital environment to optimise building performance and energy use. The implementation of smart systems in buildings and the interconnection between them in energy communities comes to improve the flexibility of the energy system, as the arrangements and measures so far concerned only energy production and use. In addition, data collection through the digitalisation of the buildings sector should help implement more targeted energy saving and RES measures during renovation, but also better integrate new technologies such as electromobility and energy storage.

Despite the benefits of implementing digital technologies in buildings, challenges remain that prevent the faster and wider uptake of these technologies in the sector. The lack of skilled human resources in digitalisation, low expected returns as well as low awareness among users of the benefits of using digital technology are the main obstacles to further penetration of digitalisation in the development of energy-efficient buildings. This is due to the perception that the use of digital technology often requires high upfront investment costs to purchase the necessary equipment and software and upskill employees. Stakeholders are therefore often concerned that the adoption of digital technology will not bring significant advantages to offset the initial investment22.

The challenges of the digitalisation of the construction sector are even greater for Cyprus due to the small size, fragmented construction sector and the overall negative perception of digitalisation, where Cyprus lags behind EU bonds. For example, the use of Building Information Modelling Systems (BIM) is very limited in Cyprus, both in the private and public sectors, while there is no strategy to promote it in the construction industry [22].
Public procurement policies – such as BIM requirements in public tenders – promote the digitalisation of the construction sector. Government e-services also play a key role in facilitating the digitalisation of processes related to construction. This is the case, for example, in the case of digitalisation of building permit systems. Until recently, the system of planning and building permits was based on paper applications and paper plans/calculations. This has recently changed with the creation of "IPODAMOS", an integrated IT system for the issuing and management of planning and building permits.

In addition, the Cadastre Portal of the Department of Cadastre and Surveys was launched

22Vision of Cyprus Energy and Climate Plan – Task 5.2: "Report on inputs and policy elements to update the Cypriot National Long-Term Renovation Strategy" by Trinomics consultant in cooperation with the Cyprus Institute.

a few years ago. It is a modern online platform, providing comprehensive and easy access to real estate related geographic data through digital services. The portal serves as the central point of reference and the future central platform for all spatial and other data included in the INSPIRE Directive, enhancing interoperability between different governmental, semi-public organisations and the general public.

In addition to the above, since the start of the implementation of the EPBD, the Energy Service of the Ministry of Energy has developed a central electronic database for EPCs together with their relevant data. It also intends to implement an online one-stop platform for building renovations including building renovation passports (see Chapter 4.5.2).

In addition, the recast EPBD goes a step further on digitalisation and the use of smart technologies:

1. The voluntary implementation of a 'digital building logbook', i.e. a common repository for all building-related data, including data on energy performance, such as energy performance certificates, renovation passports (BRP) and the smart readiness indicator (SRI). The digital calendar will facilitate evidence-based decision-making and information sharing within the construction sector, and between building owners and occupants, financial institutions and public bodies.
2. Ensuring consistency and consistency of information from Member States, which should ensure that the national database on the energy performance of buildings is interoperable and integrated with other administrative databases containing information on buildings, such as the national building register or cadastre and digital building logbooks.
3. Encourage the use of digital technologies for the analysis, simulation and management of buildings, including for deep renovations.
4. The installation of building automation and control systems that can support the energy-efficient, economical and secure operation of technical building systems by means of automatic controls and by facilitating the manual management of those technical building systems.
5. Encourage the use of systems that contribute to demand-side flexibility, for example through demand management, electricity storage, heat storage and distributed renewable energy generation to support a more reliable, sustainable and efficient energy system.

In view of the developments mentioned above, the main challenge for Cyprus is to develop a plan for the digitalisation of the building sector and to administer and coordinate the various initiatives to serve this planning.

7.1 Smart readiness indicator for buildings

The Smart Readiness of Buildings Indicator (SRI) will be used to measure the capacity of buildings to use information and communication technologies and electronic systems in order to adapt the functioning of buildings to the needs of occupants and the grid and to improve the energy and overall performance of buildings.

The objective of the smart readiness indicator for buildings is to raise awareness among owners and occupants of the value of automation and electronic monitoring of technical building systems and to inspire confidence in occupants about the actual savings that these new enhanced functionalities can achieve.

Based on the EPBD, the European Commission has adopted aHYPERLINK "https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32020R2155"Delegated Regulation 2020/2155/EU establishing a common system for rating the smart readiness of buildings. The assessment of the smart readiness of buildings shall be based on an assessment of the building or building unit as regards the ability to adapt its operation to the needs of the occupants and the grid, and the potential to improve its energy and overall performance. In particular, its calculation methodology will be based on three main functionalities regarding the building and its technical systems:

1. The ability to maintain energy performance levels and the functioning of the building through the adaptation of energy consumption, for example through the use of energy from renewable sources.
2. The ability to adapt the way in which the building works to the needs of occupants, while taking into account user-friendliness, maintaining healthy indoor climate conditions and enabling information on energy consumption.
3. The flexibility of a building's overall electricity demand, including its ability to enable participation in active and passive as well as implicit and explicit demand response, in relation to the grid, for example through flexibility and load shifting capacities.

Inaddition, the European Commission has adopted Implementing Regulation 2020/2156/EU clarifying the technical details for the effective implementation of the system and clarifying the complementary relationship of the system to EPCs. In addition, two technical studies have been carried out on behalf of the European Commission to define the smart readiness indicator for buildings and the methodology for calculating it.

The implementation of the smart readiness indicator rating scheme by Member States is voluntary. The Law regulating the Energy Performance of Buildings gives the Minister for Energy, Commerce and Industry the possibility to issue a Decree setting out matters relating to the common smart readiness indicator rating scheme that will not be covered

by the delegated regulation adopted by the European Commission.

As mentioned in Chapter 4.4, the Energy Service of the Ministry of Energy participates in the Advisory Committee of the SRI2MARKET, easySRI and Smart2 projects concerning the Intelligent Preparedness Index (SRI) of a building. The bodies involved in these research programmes, namely the Cyprus Energy Office, Frederick University, and CyRIC Ltd and Euphyia Tech Ltd, together with MECI, have set up a cooperation group to participate in the SRI pilot testing phase. The pilot testing phase is organised by the European Commission and should help develop know-how and the upcoming regulation of the issue based on the recast EPBD, while helping to adapt the SRI to national needs and requirements.

7.2 Energy and renewable energy communities

In accordance with Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources, Member States shall ensure that final customers, in particular households, have the right to participate in a renewable energy community. In addition to their participation, they retain their rights or obligations as final customers without being subject to unjustifiable or discriminatory conditions or procedures that would prevent their participation in a renewable energy community. In the case of private undertakings, their participation is permitted provided that it does not constitute their principal commercial or professional activity.

At the same time, in line with Directive (EU) 2019/944 on the internal market for electricity, Member States shall provide an enabling regulatory framework for citizen energy communities. A citizen energy community is defined as a legal entity that:

1. It is based on voluntary and open participation and is effectively controlled by partners or members that are natural persons, local authorities, including municipalities, or small enterprises.
2. Its primary purpose is to provide environmental, economic and social community benefits for its members or partners or the local areas where it operates and not to generate economic profits.
3. It may be active in generation, including production from renewable sources, distribution and supply of electricity, consumption, aggregation, energy storage, energy efficiency services, charging services for electric vehicles, or provision of other energy services to its partners or members.

As regards energy communities, the provisions of Directive (EU) 2019/944 on common rules for the internal market in electricity have been transposed into the Electricity Market

Regulation Laws of 2021 and 2022 which provide for the establishment of a regulatory framework to ensure that citizen energy communities are open to cross-border participation and have the right to own, establish, purchase or lease distribution networks and to manage them autonomously. In addition, the Laws ensure inter alia open and voluntary participation in citizen energy communities, the possibility of partners or members of an energy community to leave the community, access to all electricity markets, directly or through aggregation, in a non-discriminatory manner, and the organisation within the citizen energy community of the joint use of the electricity produced by the generation units owned by the community.

The provisions of Directive 2018/2001/EU on the promotion of the use of energy from renewable sources (recast) concerning renewable energy communities have been transposed into the Promotion of the Use of Renewable Energy Sources Law of 2022 (Law 107 (I)/2022). On the basis of Article 37 of the Law, CERA adopts a regulatory decision setting out the framework for the operation of these communities and assesses the barriers and potential for the development of renewable energy communities in the Republic of Cyprus. CERA put to a public consultation, which ended on 1 July 2024, a preliminary draft regulatory decision in relation to the regulatory framework to promote the development of Citizen Energy Communities and Renewable Energy Communities. The final regulatory framework is expected to be in place before the end of 2024.

8. Improving skills and education in the construction and energy efficiency sector

Training all professionals involved in the energy efficiency of buildings and in particular in the energy upgrading of existing buildings is a fundamental measure to increase energy renovations. The most important are professionals whose main job is the design of buildings, the design of technical systems in buildings, including RES systems, and installers of building elements affecting their energy performance.

It is important to recognise that construction workers gradually acquire the skills needed for energy-efficient building renovations and through their professional experience without necessarily being accompanied by specialised training. For example, legislative obligations for high energy performance of new buildings have led many workers in the sector to acquire skills in thermal insulation and installation of heat pumps and photovoltaics. This knowledge is easily transferred to the renovation of existing buildings23.

Also, unlike most European countries, Cyprus has an experienced and properly trained heat pump workforce. This is an advantage in the electrification and energy upgrading of buildings and results from the fact that due to climate the installation of heat pumps for cooling purposes in buildings is a practice of decades.

The Energy Service participated in the debate on "The needs of the Cypriot economy in green occupations and skills". The debate was organised by the Human Resources Development Authority (HRDA), which is a legal entity governed by public law whose task is to create the conditions for planned and systematic training and development of Cyprus' human resources, at all levels and in all sectors, to meet the needs of the economy within the framework of the social and economic policy of the State. The main conclusions of the debate are set out in Annex II.B to the public consultation.
In addition, the Energy Service receives technical assistance for a study to assess existing certification and qualification schemes for professionals related to energy efficiency and comparison with those of other Member States.

The main actions implemented in Cyprus are listed below to ensure that properly trained human resources are in place to accelerate the renovation rate.

23Vision of Cyprus Energy and Climate Plan – Task 5.2: "Report on inputs and policy elements to update the Cypriot National Long-Term Renovation Strategy" by Trinomics consultant in cooperation with the Cyprus Institute.

8.1 Technical education and training

Middle Technical and Vocational Education (METEE) is secondary education and is provided through a three-year course. Through the theoretical and practical direction and through a balanced programme of general education and technological/laboratory specialisation, it aims to prepare graduates for immediate employment, or to continue their academic path in higher education institutions. The TBT aims to provide specific professional knowledge, skills and competences that are also relevant to the energy performance of buildings among others.

In the field of engineering in theory, the speciality 'Mechanical installations of buildings' and the corresponding speciality 'Engineering building installations' are offered in the practical direction. These two specialities offer, inter alia, training in heating, air-conditioning, ventilation, ventilation and hot water installations, as well as information on their role in saving energy. Both specialisations are offered in their current form since the school year 2016-2017. Since then, the speciality of practical direction, in which particular emphasis is placed on laboratory courses in the sector and immediate integration into the labour market, has been 239 graduates. At least from 1976 to 2016, where it was replaced by the above.

In the practical direction of the electrical and electronic applications sector, the speciality 'Household appliance, cooling and air-conditioning technician', which aims to train the installation, inspection, repair and maintenance of various electrical household appliances and refrigeration and air-conditioning installations, is offered. The specialty has been in operation since the 2016-2017 school year and has 395 graduates until 2024.
At least from 1990 to 2016, where it was replaced by the above.

The Post-Secondary Institutes for Vocational Education and Training (MIVET) are a Public School of Higher Vocational Education and Training (DAPVET). Their aim is to offer modern study programmes, which provide scientific, technical and professional knowledge and skills, which integrate students smoothly and effectively into the modern working environment. They have completed, among other things, a curriculum for 'Cold and Climate Facilities', which, at the end of the programme, graduates possess the necessary professional skills and technical skills in the procedures and methods for installing, maintaining, managing and repairing refrigeration and air-conditioning systems in a safe and environmentally conscious manner. At the same time, graduates are able to determine the qualitative and economic criteria for the operation of an air conditioning system or a refrigeration installation. The programme operated for the first time in the school year 2012, and since 2017, where it was recognised as DIVET, it has 204 graduates until 2024.

Graduates of the MTEE's 'Psychotic and Climate Facilities' and 'Household appliance, refrigeration and air-conditioning technician' of the MTEE, after written and practical

examinations, can obtain a certificate of suitability for 'Fluorinated greenhouse gas operators'. This certificate is issued by the Department of Environment of the Ministry of Agriculture and the Environment of the Republic of Cyprus and is recognised by all European Union countries. The first courses to obtain the relevant certification were given by the EBA in April 2010. Since then, 6388 class I, 391 class II, 4 class III and 14 class IV certificates have been issued by several bodies attesting that their holder meets the requirements for carrying out relevant activities as referred to in Article 3 of Implementing Regulation 2015/2067/EE establishing minimum requirements and the conditions for mutual recognition for the certification of natural persons in respect of stationary refrigeration, air-conditioning and heat pump equipment, and refrigeration units in refrigerated trucks and trailers containing fluorinated greenhouse gases.

8.2 System of Professional Qualifications (SEP) Human Resources DevelopmentAuthority (HRDA)

The Human Resources Development Authority (HRDA) has established and manages a Professional Qualifications System (SEP) with a view to upgrading human resources through the evaluation and certification of candidates' professional qualifications. The assessment of candidates' professional qualifications is carried out on the basis of Qualifications Standards (PQs) developed by the ADA.

Applicants' learning outcomes are determined and documented, taking into account their previous learning, by a Professional Qualifications Assessment Centre (KEPC) approved by the ADE.

Certification of professional qualifications is carried out by the ADA on the basis of the evaluation reports of the Professional Qualifications Assessors. The Professional Qualifications Certificates awarded to successful candidates are part of the Cyprus Qualifications Framework (CyQF), which is linked to the European Qualifications Framework (EQF) and are reliable and valid career supplies, in addition to facilitating the mobility of their holders within the European Economic Area.

Among the sectors of the economy in which Professional Qualifications Standards have been developed are the construction industry with professional fields such as 'Central Heat Systems Technician', 'Air conditioning and cooling plant technician', 'External thermal insulation and thermal insulation technician', 'Placing technician', 'Glass installation technician', 'Solar thermal systems installation and maintenance technician for space heating, air conditioning and domestic hot water', 'Enabling and maintenance technician for automation and electronic building systems' and 'Enabling of heat pumps and geothermal systems'.

8.3 Convention and Memorandum of Cooperation between the AnAD and the FAS Research Unit of the University of Cyprus

On 12 October 2023, a contract and a Memorandum of Understanding for the implementation of the project 'Training Programmes for the acquisition of knowledge and skills related to the green economy' between the Cyprus Human Resources Development Authority (HRDA) and the Energy Sustainability Research Unit of the University of Cyprus, which is becoming a Centre of Excellence of FETHON, was signedon. The project is funded by the European Union's Recovery and Resilience Facility – NextGenerationEU through the Cyprus Recovery and Resilience Plan.

The Convention provides for the implementation of 148 training programmes to train around 2.000 people with an estimated cost of EUR 722.160. The training agenda is flexible and can be expanded and is initially planned to focus on the following areas:

1. Designer and installer of photovoltaic systems.
2. Operation, maintenance, performance evaluation and addressing PV system problems.
3. Photovoltaic systems integrated into buildings.
4. New concepts and emerging applications of photovoltaics (stand-alone and hybrid PV, agro-electric and floating PV).
5. Circular economy PV systems: opportunities for repair, reuse or recycling.
6. Control and inspection of photovoltaic systems.
7. Smart Grids: technologies, management and practical applications.
8. Energy storage: Multifaceted role in the modern power grid.
9. Benefits from the creation and management of energy communities.
10. Energy flexibility and efficiency in grid transformation.
11. Smart energy management systems.
12. Electricity market rules.
13. Integration of electric mobility into the electricity system.
14. Green hydrogen in the energy transition.
15. Heat pumps in the green transition.
16. Concepts, framework and policies for an inclusive green economy.
17. Emerging technologies and skills to develop smarter and greener cities.
18. Introduction to nearly zero-energy buildings.

The training programmes are offered free of charge and beneficiaries are employed in the private, public and wider public sector, self-employed and unemployed.

8.4 Independent energy efficiency experts

Independent experts have already been created through legislation and have the task of providing, in an objective and independent manner, advice on the energy improvement of the building in its entirety or in its individual components. This legislation ensures an adequate level of expert knowledge through qualification, experience, training and examination requirements (Table 09).

Independent experts	**Qualifications**
Specialised Residential Expert	(1) Architect, Civil Engineer, Engineer Engineer, Electrician Engineer, Chemist Engineer, Engineer Environment (ETEK Member) (2) At least 1 year of proven experience in the field of buildings or energy or technical building systems (3) Pass an exam
Qualified Non-residential expert	(1) Architect, Civil Engineer, Engineer Engineer, Electrical Engineer (Member of ETEK) (2) At least 3 years of proven experience in the field of buildings or energy or technical building systems (3) Pass an exam
Inspector Heating systems	(1) Mechanical Engineer (Member of ETEK) (2) At least 3 years of professional experience in studies, construction, maintenance of building heating systems (3) Pass an exam
Air conditioning system inspector	(1) Mechanical Engineer (Member of ETEK) (2) At least 3 years of professional experience in studies, construction, maintenance of building air-conditioning systems (3) Class I suitability certificate, F-gas management issued by a certification body
Energy Auditor A	(1) Engineer registered with ETEK (2) At least 3 years of documented professional experience in energy audits of buildings and/or industrial installations or issues energy and in particular,in issues savings energy/energy efficiency improvement in buildings and/or industries and/or in the design and/or operation of complex electromechanical installations in buildings and/or industries (3) Attending a training programme 4. Pass an exam
Energy Manager	Attending a training programme

PINAKA 8.1: INDEPENDENTEXPERTISE IN THE FIELD OF ENERGY EFFICIENCY OF BUILDINGS

The designation in 2009 of specialised experts to be responsible for calculating the energy performance of buildings and issuing EPCs and recommendations provided an opportunity

to train architects, civil engineers, mechanical engineers and electrical engineers on the energy performance of buildings. Although training is not provided for in the qualifications set out in the Law for Specialised Experts, the Energy Service organised dozens of training seminars to prepare interested parties for the relevant examination. The seminars for Specialised Experts on Housing were for 16 hours and covered issues of legislation, energy efficiency calculation and cost-optimal measures to improve the energy performance of the building. Approved specialist expert candidate assessment bodies are the Cyprus Energy Office and Frederick University.

For energy auditors of buildings, it is mandatory to monitor and complete successfully after examinations of a 80-hour specialised theoretical and practical training programme. The training is provided by educational and examination organisations approved by the Energy Service. These organisations are the cooperation between the University of Nicosia and the Energy Office and Frederick University.

There is also educational activity on technical building systems. Frederick University has been approved by the Energy Service as the evaluation body for potential inspectors of heating systems and has organised a total of 3 trainings on this subject.

In 2016, a decree of the Minister for Energy, Commerce and Industry created the legal framework for Energy Managers. In accordance with the legislation, any organisation and company may appoint a sender as an energy manager, provided that it will follow a training programme approved by the Energy Service. The Energy Manager undertakes to monitor energy use issues in the undertaking or organisation in which he works and undertakes the planning and monitoring of actions to increase energy efficiency and reduce energy consumption. Unlike the above independent experts, the Energy Manager is a member of the undertaking or organisation that promotes energy efficiency through its hierarchy and structures. In particular in small enterprises that do not have the resources to purchase external services from Energy Auditors and/or large investments, the Energy Manager can help with a change in energy use culture and other low-cost measures.
The training of Energy Managers shall be carried out in training organisations designated by the Energy Service, which, after attending the training, shall provide the trainees with a relevant certificate of attendance of the training programme. To date, three trainings have taken place at the European Energy Manager – EUREM Seminar organised by the Energy Office. In addition, through the European SMEmPower Efficiency project, the OEB in cooperation with the University of Cyprus carried out 3 training programmes for energy managers, where a total of 79 people were trained and certified, coming from 52 companies from different industries.

8.5 Installers

As regards building element installers, professional education and training is provided to them through initial and ongoing training programmes. The intermediate and technical and vocational training provided at technical schools of secondary education also includes subjects directly related to the energy performance of buildings such as mechanical engineering, electrical engineering and building.

However, in order to achieve the objectives in the area of energy performance of buildings, a sufficient number of reliable installers are required to be available. The establishment of the register of installers by the Energy Service aimed at ensuring certain minimum quality levels in terms of installation of systems and their energy efficiency. Quality assurance is expected to gradually increase the confidence of building owners in technical staff working in the field of technical systems of small-scale RES systems as well.

As regards installers of technical systems, natural persons shall be entered in the Register as installers if, inter alia, they hold relevant certificates of qualification for defined categories, as shown in Table 10.

N/A	Categories	Required certificates of professional qualifications issued by the Professional Qualifications Certification Body for the level of qualified technician.
1.	**Category A:** Technical equipment installers for heating systems	1. Building Industry, Professional Qualification "Central Heating Systems" (Level 4) 2. Building Industry, Professional qualification "plumbing" (Level 4)
2.	**Class B:** Equipment installers for air-conditioning and ventilation systems.	1. Building Industry, Professional qualification "plumbing". (Level 4) 2. Building Industry, Professional Qualification "Cooling and Air Conditioning Systems" (Level 4)
3.	**Category C:** Technical equipment installers for hot water systems.	Building Industry, Professional qualification "plumbing" (Level 4)

PINAKA 8.2: INSTALLATIONOF TECHNICAL BUILDING SYSTEMS

Legal persons shall also be entered in the register as installers of technical systems, provided that they have at least one registered installer in their capacity or have entered into contracts with at least one natural person installer. When a legal person is registered as an installer, the category or categories of systems for which the installer is authorised to carry out relevant work shall be determined, depending on the categories of natural persons of installers employed or contracted. 37 private limited companies and 3 natural persons are registered in the Register of installers of technical building systems.

In addition, under the 2015 Regulations on Promotion and Encouragement of the Use of

Renewable Energy Sources (Certification of Small Scale Renewable Energy Systems Installators), the Energy Service carries out the certification of small-scale RES system installers and their registration in the register of technical systems installers. The certification concerns the following categories of RES system installers:

1. Category A: Installers of biomass boilers and stoves.
2. Class B: Heat pump installers.
3. Category C: Installers of solar photovoltaic systems.
4. Category D: Installers of solar thermal systems.

Registration in the installer register certifies professional competence for installers of RES systems with a nominal power of up to 30 kW. The register has registered 345 installers in the category of photovoltaic systems and 52 in the category of solar thermal systems.

Before enrolment, applicants must attend a training course from an authorised body and pass examinations organised by an authorised examination organisation. The Energy Service has so far authorised six training bodies and four examination organisations, which organise training and examination programmes at regular intervals.

The certification of installers is voluntary. However, certain support programmes or sponsorship plans require that RES systems be installed by certified installers. For example, according to the provisions of the 'Plan for the Production of Electricity from Renewable Energy Sources (RES) for own consumption', the installation of photovoltaic systems for netting metering and net billing with a power of up to 30 kW must be carried out by certified installers entered in the register of installers of photovoltaic systems.

9. An estimate of energy savings and overall benefits and a roadmap until 2050.

Cyprus' energy and climate objectives under the new European institutional framework (Fit-for-55) are:

1. Reducing greenhouse gas emissions by 32 % by 2030 compared to 2005.
2. Contribution to the mandatory target of at least 42.5 % Renewable Energy Sources (RES) in EU gross final consumption by 2030. An indicative target of an additional 2.5 % increase, i.e. an overall RES share of 45 % at EU level in 2030, is also introduced. Sub-national RES targets:
    2.1. contribution to the mandatory target of an annual increase of at least 0.8 % in the period 2026 to 2025 and 1.1 % in the period 2021 to 2030 of the share of RES in the heating and cooling sector;
    2.2. a contribution to the indicative EU target of renewable energy use in buildings of at least 49 % in 2030;
3. Contribution to the mandatory 11.7 % energy efficiency target at EU level by 2030:
    3.1. Indicative national contribution to the EU's 2030 primary energy consumption target of 2,03 Mtoe and final energy consumption in 2030 to 1,80 Mtoe (a reduction of 11.4 % and 11.5 % respectively compared to the corresponding Commission forecast for Cyprus in 2020).
    3.2. Achieving a mandatory cumulative end-use energy savings target of 349,04 ktoe in 2021-2030, with measures going beyond what is required by European legislation and an obligation of 52,70 ktoe (15.1 % of the target) to be achieved by implementing efficiency measures for consumers affected by energy poverty.
    3.3. Reduction of final energy consumption in public bodies (public and wider public sector) by 1.9 % per year compared to 2021 (indicative up to 2027, mandatory from 2028)
    3.4. The obligation to renovate annually 3 % of the total surface area of public buildings is extended to all buildings owned and occupied by public bodies (public and wider public sector).

To revise the national targets and targets by 2030, building on the new 'Fit for 55' policy of the European Union with a central target of reducing net greenhouse gas emissions by at least 55 % by 2030, the following scenarios have been developed:

1. Expected Evolution (BaU) – this scenario assumes that historical trends persist until the end of the modelling horizon.

2. With existing measures (AMMs) – this scenario takes into account already adopted policies and measures and assesses their impact on GHG emissions.
3. Additional measures (AFM) – this scenario takes into account planned and additional policies and measures, which should indicate an effort to comply with the new national energy and climate targets.

9.1 forecasts by 2030

Table 10 shows the expected final energy consumption, the share of renewable energy sources and the greenhouse gas and gaseous pollutant emissions of the building sector by 2 030 in the SMP of the revised NECP. The data are presented separately for dwellings and the tertiary sector, as well as aggregated. Accordingly, Table 11 shows the projected evolution of the AFM. The differences between the two scenarios are recorded in absolute terms in Table 12 and as percentage changes in Table 13.

Thanks to the additional energy efficiency measures adopted in the AFM, the final energy consumption of the building sector in 2030 is reduced by 62 ktoe or 8.5 % compared to the SRM. The decrease is 9.5 % in dwellings and 7 % in the tertiary sector.

With regard to RES penetration in the building sector, the continued investment in RES technologies and heat pumps leads to an increase in the share of RES to 63.2 % in 2030, also taking into account the contribution of renewable cooling. In the AFM the corresponding share is 65.4 %. The increase is due to further penetration of both solar thermal technologies and heat pumps in buildings.

Final energy consumption in the building sector (ktoe)										
SCENARIO WITH EXISTING MEASURES (FN)										
Housing	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Heating oil/Kirrozine	62,6	68,1	69,8	73,9	75,6	75,8	76,3	78,5	77,8	77,5
Fuel oil	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
LPG	37,8	39,7	42,3	46,4	49,5	51,3	53,2	57,9	61,1	63,1
Electrics	156,3	152,9	152,8	157,7	159,6	160,6	161,5	164,7	168,2	171,6
Biofuel	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Biomass/Biogas	20,7	22,0	22,1	22,7	22,7	22,4	22,3	22,8	22,6	22,5
Geothermal	0,0	0,0	0,0	0,1	0,1	0,1	0,2	0,2	0,3	0,3
Solar energy	64,0	65,0	67,7	72,8	76,3	78,0	80,0	86,5	91,3	94,1
Total	**341,4**	**347,8**	**354,6**	**373,6**	**383,9**	**388,1**	**393,5**	**410,6**	**421,2**	**429,1**
Environmental energy	18,0	18,6	19,9	21,3	22,7	24,0	25,4	26,7	28,1	29,5
RES rate (%)	45.7 %	44.6 %	44.5 %	44.3 %	44.2 %	44.2 %	44.2 %	44.5 %	45.1 %	45.4 %
Share of RES (%) – with ambient energy	50.6 %	49.5 %	49.5 %	49.3 %	49.3 %	49.5 %	49.7 %	50.0 %	50.6 %	51.0 %
Greenhouse gas emissions (Mt CO2e)	0,295	0,317	0,329	0,353	0,366	0,371	0,378	0,397	0,404	0,408
Tertiary sector	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Heating oil/Kirrozine	22,6	24,4	23,0	23,3	23,0	22,3	21,6	21,4	21,5	21,3
Fuel oil	4,2	3,9	3,7	3,8	3,8	3,7	3,7	3,7	3,7	3,7
LPG	12,3	14,4	13,7	14,4	14,8	15,1	15,1	15,7	17,0	17,5
Electrics	179,8	200,7	197,8	204,3	207,1	208,7	209,4	212,3	216,5	220,0
Biofuel	0,9	1,0	0,9	0,9	0,8	0,7	0,7	0,6	0,5	0,4
Biomass/Biogas	7,1	8,5	8,2	8,8	9,4	9,8	10,1	10,9	12,5	13,2
Geothermal	0,0	0,0	0,0	0,0	0,1	0,1	0,1	0,2	0,3	0,5
Solar energy	11,3	11,5	13,4	14,1	14,8	15,5	16,2	18,0	22,1	24,6
Total	**238,1**	**264,3**	**260,7**	**269,6**	**273,8**	**276,0**	**276,9**	**282,8**	**294,1**	**301,1**
Environmental energy	65,4	66,1	73,9	81,8	89,6	97,4	105,3	113,1	120,9	128,7
RES rate (%)	33.1 %	33.0 %	35.8 %	36.6 %	37.6 %	38.9 %	40.2 %	42.2 %	45.6 %	47.6 %
Share of RES (%) – with ambient energy	68.4 %	67.1 %	70.5 %	71.8 %	73.4 %	75.0 %	76.6 %	77.8 %	78.7 %	79.8 %
Greenhouse gas emissions (Mt CO2e)	0,116	0,127	0,120	0,123	0,123	0,121	0,119	0,120	0,124	0,125

Table continues

Total Buildings	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Heating oil/Kirrozine	85,2	92,6	92,7	97,1	98,6	98,1	97,9	99,8	99,3	98,8
Fuel oil	4,2	3,9	3,7	3,8	3,8	3,7	3,7	3,7	3,7	3,7
LPG	50,1	54,1	56,0	60,7	64,3	66,4	68,3	73,6	78,1	80,6
Electrics	336,1	353,6	350,6	362,0	366,7	369,3	370,9	377,0	384,7	391,6
Biofuel	0,9	1,0	0,9	0,9	0,8	0,7	0,7	0,6	0,5	0,4
Biomass/Biogas	27,8	30,6	30,3	31,6	32,1	32,2	32,4	33,7	35,1	35,7
Geothermal	0,0	0,0	0,0	0,1	0,2	0,2	0,3	0,4	0,6	0,8
Solar energy	75,3	76,5	81,0	87,0	91,2	93,5	96,2	104,6	113,3	118,6
Total	**579,5**	**612,1**	**615,3**	**643,2**	**657,7**	**664,1**	**670,3**	**693,5**	**715,3**	**730,2**
Environmental energy	83,4	84,7	93,9	103,1	112,3	121,5	130,6	139,8	149,0	158,2
RES rate (%)	42.7 %	41.8 %	42.4 %	42.5 %	42.7 %	43.0 %	43.3 %	44.0 %	45.2 %	45.9 %
Share of RES (%) – with ambient energy	57.3 %	56.1 %	57.5 %	57.9 %	58.7 %	59.6 %	60.5 %	61.2 %	62.2 %	63.2 %
Greenhouse gas emissions (Mt CO2e)	0,411	0,444	0,449	0,475	0,489	0,493	0,497	0,517	0,528	0,533
Indirect greenhouse gas emissions (Mt CO2e)	2,626	2,703	2,507	2,421	2,176	1,690	1,481	1,479	1,484	1,180
Gaseous pollutant emissions (t)										
NOx	394	427	430	454	466	470	474	493	506	512
PM10	924	1014	1003	1043	1059	1061	1065	1104	1144	1163
PM2,5	900	987	977	1016	1032	1034	1037	1075	1114	1133
SO2	276	298	298	311	316	314	314	320	319	318
Indirect emissions of gaseous pollutants (t)										
NOx	1138	1194	1125	1120	1056	1040	1017	1035	1058	610
PM10	193	192	210	205	105	104	69	70	73	31
PM2,5	155	153	169	164	79	79	48	50	52	22
SO2	2514	2500	2488	2487	623	614	618	616	613	6

ΠΙΝΑΚΑ9.1: GREEKENERGY CONSUMPTION AND EMISSIONS OF GREENHOUSE GAS AND GASEOUS POLLUTANTS IN THE BUILDINGSECTOR INTHE SYSTEMOF energy sources

Final energy consumption in the building sector (ktoe)

ADDITIONAL MEASURES SCENARIO (AFM)

Housing	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Heating oil/Kirrozine	62,6	68,1	69,8	71,8	71,9	70,9	70,8	70,4	67,3	65,6
Fuel oil	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
LPG	37,8	39,7	42,3	44,9	46,9	48,1	49,7	52,3	53,7	54,8
Electrics	156,3	152,9	152,8	153,3	154,5	154,9	155,5	157,5	159,6	161,9
Biofuel	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Biomass/Biogas	20,7	22,0	22,1	22,4	22,1	21,7	21,5	21,6	21,1	20,8
Geothermal	0,0	0,0	0,0	0,1	0,1	0,1	0,1	0,2	0,2	0,3
Solar energy	64,0	65,0	67,7	70,7	72,8	73,9	75,8	80,0	82,9	84,8
Total	**341,4**	**347,8**	**354,6**	**363,2**	**368,3**	**369,5**	**373,5**	**382,0**	**385,0**	**388,2**
Environmental energy	18,0	18,6	19,9	21,3	22,7	24,0	25,4	26,7	28,1	29,5
RES rate (%)	45.7 %	44.6 %	44.5 %	44.4 %	44.4 %	44.6 %	44.7 %	45.3 %	46.3 %	46.8 %
Share of RES (%) – with ambient energy	50.6 %	49.5 %	49.5 %	49.5 %	49.8 %	50.1 %	50.5 %	51.1 %	52.2 %	52.9 %
Greenhouse gas emissions (Mt CO2e)	0,295	0,317	0,329	0,342	0,348	0,348	0,352	0,358	0,352	0,349

Tertiary sector	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Heating oil/Kirrozine	22,6	24,4	23,0	23,3	22,7	22,0	21,3	20,6	19,8	19,0
Fuel oil	4,2	3,9	3,7	3,8	3,7	3,7	3,6	3,6	3,5	3,4
LPG	12,3	14,4	13,7	14,4	14,5	14,7	14,9	15,0	15,3	15,2
Electrics	179,8	200,7	197,8	199,3	201,4	202,6	203,3	204,7	206,3	207,8
Biofuel	0,9	1,0	0,9	0,9	0,8	0,7	0,7	0,6	0,5	0,4
Biomass/Biogas	7,1	8,5	8,2	8,8	9,2	9,7	10,1	10,6	11,5	11,9
Geothermal	0,0	0,0	0,0	0,0	0,1	0,1	0,1	0,2	0,3	0,4
Solar energy	11,3	11,5	13,4	14,1	14,6	15,3	16,2	17,5	20,1	21,8
Total	**238,1**	**264,3**	**260,7**	**264,6**	**267,1**	**268,7**	**270,3**	**272,7**	**277,2**	**280,0**
Environmental energy	65,4	66,1	73,9	81,8	89,6	97,4	105,3	113,1	120,9	128,7
RES rate (%)	33.1 %	33.0 %	35.8 %	36.6 %	37.5 %	39.0 %	40.5 %	42.4 %	45.7 %	47.8 %
Share of RES (%) – with ambient energy	68.4 %	67.1 %	70.5 %	71.8 %	73.6 %	75.3 %	76.9 %	78.4 %	79.9 %	81.3 %
Greenhouse gas emissions (Mt CO2e)	0,116	0,127	0,120	0,123	0,121	0,119	0,118	0,115	0,113	0,111

Table continues

Total Buildings	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Heating oil/Kirrozine	85,2	92,6	92,7	95,1	94,6	92,9	92,2	91,1	87,1	84,6
Fuel oil	4,2	3,9	3,7	3,8	3,7	3,7	3,6	3,6	3,5	3,4
LPG	50,1	54,1	56,0	59,3	61,5	62,8	64,6	67,3	69,0	70,0
Electrics	336,1	353,6	350,6	352,6	355,9	357,5	358,8	362,2	365,9	369,8
Biofuel	0,9	1,0	0,9	0,9	0,8	0,7	0,7	0,6	0,5	0,4
Biomass/Biogas	27,8	30,6	30,3	31,2	31,3	31,3	31,6	32,2	32,6	32,7
Geothermal	0,0	0,0	0,0	0,1	0,1	0,2	0,3	0,4	0,5	0,6
Solar energy	75,3	76,5	81,0	84,9	87,4	89,2	92,0	97,5	103,0	106,7
Total	**579,5**	**612,1**	**615,3**	**627,8**	**635,4**	**638,2**	**643,8**	**654,7**	**662,2**	**668,2**
Environmental energy	83,4	84,7	93,9	103,1	112,3	121,5	130,6	139,8	149,0	158,2
RES rate (%)	42.7 %	41.8 %	42.4 %	42.5 %	42.8 %	43.2 %	43.7 %	44.6 %	46.1 %	47.1 %
Share of RES (%) – with ambient energy	57.3 %	56.1 %	57.5 %	58.2 %	59.2 %	60.4 %	61.4 %	62.5 %	64.2 %	65.4 %
Greenhouse gas emissions (Mt CO2e)	0,411	0,444	0,449	0,465	0,469	0,467	0,469	0,473	0,465	0,459
Indirect greenhouse gas emissions (Mt CO2e)	2,626	2,703	2,507	2,358	2,112	1,636	1,433	1,420	1,412	1,114
Gaseous pollutant emissions (t)										
NOx	394	427	430	445	449	448	451	456	452	448
PM10	924	1014	1003	1032	1033	1031	1039	1054	1063	1065
PM2,5	900	987	977	1005	1006	1004	1012	1027	1035	1037
SO2	276	298	298	305	304	299	296	293	282	274
Indirect emissions of gaseous pollutants (t)										
NOx	1138	1194	1126	1090	1022	987	937	937	937	553
PM10	193	192	211	199	98	95	62	61	61	28
PM2,5	155	153	170	160	74	72	43	43	43	20
SO2	2514	2500	2503	2491	639	634	640	641	641	6

ΠΙΝΑΚΑ9.2: GREEKENERGY CONSUMPTION AND EMISSIONS OF GREENHOUSE GAS AND GASEOUS POLLUTANTS OF THE BUILDING SECTOR IN THEINTEGRATED PROTATIONS OFMETERS (AFM)

EFFECT OF AFM AGAINST SYM (IN TOTAL QUANTITIES)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
CHM energy savings (ktoe)										
Housing	0,0	0,0	0,0	—	—	—	—	—	—	—
Tertiary	0,0	0,0	0,0	—	— 6,7	— 7,3	—	—	—	—
Total building sector	0,0	0,0	0,0	—	—	—	—	—	—	—
CHM electricity savings (ktoe)										
Housing	0,0	0,0	0,0	—	— 5,1	—	—	— 7,2	— 8,6	—
Tertiary	0,0	0,0	0,0	—	— 5,7	—	—	— 7,6	—	—
Total building sector	0,0	0,0	0,0	—	—	—	—	—	—	—
Reduction of AFM direct GHG emissions (kt CO2e)										
Housing	0,0	0,0	0,0	—	—	—	—	—	—	—
Tertiary	0,0	0,0	0,0	0,0	— 1,7	—	—	— 4,6	—	—
Total building sector	0,0	0,0	0,0	—	—	—	—	—	—	—
Reduction of indirect GHG emissions of the AFM in relation to SML (kt CO2e)										
Total building sector	0,0	0,0	0,0	—	—	—	—	—	—	—
Reduction of direct gaseous pollutant emissions of the AFM in relation to the SML – Total					**max (t)**					
NOx	0,0	0,0	0,0	—	—	—	—	—	—	—
PM10	0,0	0,0	0,0	—	—	—	—	—	—	—
PM2,5	0,0	0,0	0,0	—	—	—	—	—	—	—
SO2	0,0	0,0	0,0	—	—	—	—	—	—	—
Reduction of indirect gaseous pollutant emissions of the AFM in relation to the GFL – Total building sector (t)										
NOx	0,0	0,0	1,0	—	—	—	—	—	— 121,0	—
PM10	0,0	0,0	0,4	—	— 6,7	—	—	— 8,9	—	—
PM2,5	0,0	0,0	0,3	—	— 5,5	—	—	— 6,9	— 9,5	—
SO2	0,0	0,0	15,2	4,6	15,6	19,9	22,1	24,9	27,1	—

PINAKA9.3: INCREASEIN ENERGY AND EMISSIONS OF THE BUILDING SECTOR IN THE AFM IN COMPARISON WITH THE SRM.

EFFECT OF AFM AGAINST SYMM (IN QUOTA SIZE)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Energy savings of the AFM in relation to the SRM										
Housing	0.0 %	0.0 %	0.0 %	—	—	—	—	—	—	—
Tertiary	0.0 %	0.0 %	0.0 %	—	—	—	—	—	—	—
Total building sector	**0.0 %**	**0.0 %**	**0.0 %**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
CHM electricity savings										
Housing	0.0 %	0.0 %	0.0 %	—	—	—	—	—	—	—
Tertiary	0.0 %	0.0 %	0.0 %	—	—	—	—	—	—	—
Total building sector	**0.0 %**	**0.0 %**	**0.0 %**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Reduction of direct GHG emissions of the AFM in relation to the SML										
Housing	0.0 %	0.0 %	0.0 %	—	—	—	—	— 10.0 %	—	—
Tertiary	0.0 %	0.0 %	0.0 %	0.0 %	—	—	—	—	—	—
Total building sector	**0.0 %**	**0.0 %**	**0.0 %**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Reduction of indirect GHG emissions of the AFM in relation to the SML										
Total building sector	**0.0 %**	**0.0 %**	**0.0 %**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Reduction of direct gaseous pollutant emissions of the AFM in relation to the SML – Total					**MEA**					
NOx	0.0 %	0.0 %	0.0 %	—	—	—	—	—	—	—
PM10	0.0 %	0.0 %	0.0 %	—	—	—	—	—	—	—
PM2,5	0.0 %	0.0 %	0.0 %	—	—	—	—	—	—	—
SO2	0.0 %	0.0 %	0.0 %	—	—	—	—	—	—	—
Reduction of indirect gaseous pollutant emissions of the AFM in relation to the GFL – Total building sector										
NOx	0.0 %	0.0 %	0.1 %	—	—	—	—	—	—	—
PM10	0.0 %	0.0 %	0.2 %	—	—	—	—	— 12.7 %	—	—
PM2,5	0.0 %	0.0 %	0.2 %	—	—	—	— 10.7 %	— 13.9 %	—	—
SO2	0.0 %	0.0 %	0.6 %	0.2 %	2.5 %	3.2 %	3.6 %	4.0 %	4.4 %	—

PINAKA 9.4: THERMALENERGY AND EMISSION SAVINGS OF THE BUILDING SECTOR IN THE AFM IN COMPARISON WITH THE SRM.

Thanks to the combination of (a) energy savings, (b) a reduction in oil consumption and (c) greater use of RES, the direct GHG emissions of the building sector decrease in 2030 by 73 kt CO_2e or 13.7 % in the AFM compared to the corresponding emissions in the SRM. The decrease is projected to reach 14.5 % in dwellings and 11.3 % in the tertiary sector. The buildings sector thus contributes to the overall objective of reducing emissions in all sectors subject to the Effort Sharing Regulation.

In addition to the benefit in terms of direct emissions, the AFM also reduces indirect emissions from the building sector, i.e. the electricity system emissions caused by the electricity consumption of buildings. In particular, despite the general trend towards electrification of the economy, the energy saving measures of the AFM help to mitigate the increase in electricity consumption. Thus, the AFM is expected to have a 2030 5.6 % lower electricity demand compared to the MMF. This also leads to 5.6 % lower emissions of Cyprus' electricity system to 2030, corresponding to 66 kt CO_2e, thus also contributing to reducing the cost of purchasing allowances under the Emissions Trading System.

Lower consumption of oil products (heating oil, kerosene, LPG and fuel oil) also leads to lower emissions of air pollutants causing human health problems. The AFM measures and policies achieve a 12.5 % reduction in nitrogen oxides (NOx) emissions, 8.4 % in particulate matter emissions ($PM_{2,5}$ -PM 10) and a 13.8 % reduction in sulphur dioxide (SO_2) emissions. The building sector also reduces its contribution to air pollution from electricity generation. Thanks to the reduced demand for electricity in the AFM compared to the MMF, the pollutant emissions of the power generation are reduced by 9-10 % for each of the pollutants NOx, PM and SO_2.

Renovating the existing building stock will lead to energy and money savings for tenants if done in an economically and technically optimal way. However, it is also important to assess the benefits that renovations may have in society at large, such as the competitiveness of the Cypriot economy, employment, social cohesion and the environment.

Some of these quantifiable benefits are summarised below, based on the environmental benefits mentioned above.
In particular, energy savings in the building sector:

- It reduces direct greenhouse gas emissions subject to the ESR. Since, as stated in the NECP, Cyprus plans not to meet its emission reduction target under this Regulation, it should purchase allowances from other Member States equal to the excess over the whole period up to 2030. The cumulative ESR reduction of the building sector in the AFM is 264 kt CO_2e. With a assumed allowance price of EUR 85, there is a saving of 22.5 million. EUR' 2023 until 2030, due to the purchase of fewer ESR allowances.

- It reduces the allowances to be purchased by fuel suppliers under ETS2 as of 2027, the costs of which will be passed on to the retail prices of fuels. If the AFM is implemented, fewer allowances corresponding to 208 kt CO_2e would be needed at that time. With an average allowance price of EUR 55 '2023 (based on the ETS2 allowance prices provided for by the European Commission), there is a saving of 11.4 million. EUR' 2023.
- By indirectly reducing electricity emissions due to lower electricity demand in buildings, it limits the allowances to be purchased on ETS1 (and passed on to the retail price of electricity). With a cumulative emission reduction of 425 kt CO_2e in 2024-2030 and a assumed allowance price of EUR 85 million, this results in savings of 36.2 million. EUR' 2023 until 2030.
- It improves quality of life by reducing emissions of air pollutants – both those directly emitted by the combustion of fossil fuels in buildings, and those emitted in the production of electricity to meet the electricity demand of buildings. Based on the external costs of each pollutant (i.e. the cost of all damage caused by this pollutant), which is explained in detail in the NECP impact analysis (Chapter 5.2), there is an economic benefit for society of 74 million. EUR' 2023 for the period 2024-2030.

Overall, the positive environmental impact of AFM measures on the building sector shows a benefit of 144 million. Euro for society for the period 2024-2030. The above benefits are also described in Table 14.

In addition to the above, the energy upgrading works of buildings provided for in the NECP include a significant number of interventions in vulnerable households (over 8.000 to 2030). Therefore, the AFM measures for buildings are expected to address energy poverty to a satisfactory extent.

There is also a significant benefit for employment. A recent scientific study with Cypriot data, carried out by the Cyprus Institute in cooperation with the World Bank and in consultation with domestic stakeholders24, found that integrated energy upgrading investments in buildings (as provided for in the 'Savour-Upgrade' programmes) have the highest positive impact on both employment and economic growth per million euro invested in such projects. The methodology of that study was also used for the economic assessment of the green investments of the Cypriot Recovery and Resilience Plan in 2021. 25

ESR emission reduction, 2024-2030 (kt CO2e):	264,3
ESR Entitlement Price (EUR/t):	85
Reduced purchase cost of ESR allowances (MEUR):	22,5

24 Zachariadis T., Giannakis E., Taliotis C., Karmellos M., Fylaktos N., Howells M., Blyth W. and Hallegatte S. (2021). Science-Policy Frameworks for a Post-Pandemic Green Economic Recovery. *Energy Strategy Reviews* 45 (2023) 101035. doi: 10.1016/j.esr.2022.101035.

25 Andreou A., Empora N., Giannakis E., Mamuneas T., Syrichas G. and Zachariadis T. (2021). Report on the Impact Assessment of the Recovery and Resilience Plan of Cyprus.

Reduction of ETS2 allowances, 2027-2030 (kt CO2e):	208,0
ETS2 entitlement price (EUR/t):	55
Reduced purchase cost of ETS2 (MEUR):	11,4

Emissions reduction ETS1 due to electricity savings, 2024-2030 (kt CO2e):	425,4
ETS1 entitlement price (EUR/t):	85
Reduced purchase cost of ETS1 (MEUR):	36,2

Reduction of direct -indirect NOx emissions, 2024-2030 (t):	699,5
Cost of NOx damage (EUR/t):	11708
Reduction of NOx pollution costs (MEUR):	8,2

Reduction of direct -indirect emissions of PM2.5, 2024-2030 (t):	355,7
Cost of losses from PM2.5 (EUR/t):	182000
Reduction of pollution costs from PM2.5 (MEUR):	64,7

Reduction of direct -indirect SO2 emissions, 2024-2030 (t):	46,4
Cost of losses from SO2 (EUR/t):	22259
Reduction of SO2 pollution costs (MEUR):	1,0

Total economic benefit (MEUR):	**144**

PINAKA 9.5: INCOMEFOR KDUE TO THE POSITIVE ENVIRONMENTAL IMPACT OF THE AFM MEASURES IN THE BUILDING SECTOR.

9.2 Outlook to 2050

The path of the Cypriot economy towards almost full decarbonisation, i.e. net zero GHG emissions by 2050, also concerns the building sector. In order to achieve this objective, it will be necessary to combine continued investments in energy savings with a change in the energy mix to consist only of electricity and RES. The contribution of each of the two priorities (saving and changing fuel mix) will also depend on technological developments, of course taking into account the requirements of the Energy Efficiency of Buildings Directive and applying the Energy Efficiency First Principle.

Table 15 shows this path, as reflected in the NRCP AFM. The strong path towards nearly zero emissions is expected after 2040, when most of the existing energy equipment in the building stock will have been replaced. The building sector as a whole is expected to use around 60 % electricity and 38 % RES (solar, biomass and geothermal) in final energy demand, while considering both heat pumps and renewable cooling, the share of RES-C is close to 96 %.

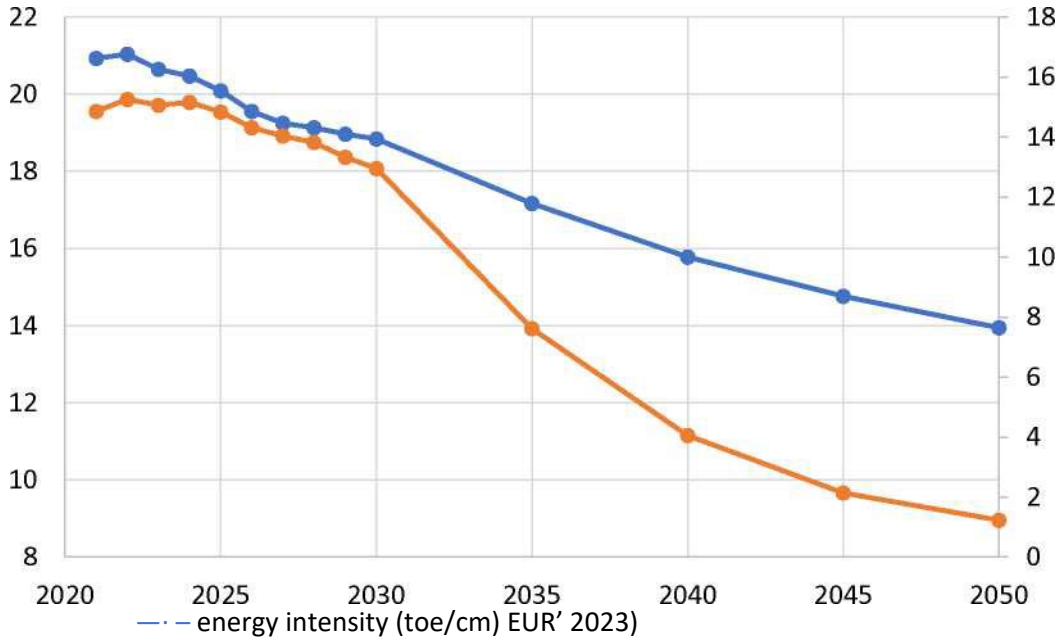
A very low share (2 %) of fossil fuel use remains in the final energy demand, as a result of equipment that has not yet been replaced. The remaining minimum greenhouse gas emissions could be compensated either by changes in land use that absorb carbon dioxide, or by other methods.

Itis evident that these trends accelerate the rate of energy savings compared to the past, and this acceleration is more pronounced since 2030. Relative to the expected evolution of Gross Domestic Product up to 2050, as used in the NECP based on forecasts by the Cypriot Ministry of Finance, energy intensity (final energy consumption per unit of GDP) is projected to decrease by 1 % per year in the decade 2021-2030 and by 1.4 % per year in the twenty years 2031-2050 – while in the decade 2010-2020 it decreased by less than 0.7 % per year.

Total Buildings	2021	2025	2030	2035	2040	2045	2050	2021	2030	2040	2050
Heating oil/Kirrozine	85,2	94,6	84,6	53,8	31,3	18,1	11,3	15 %	13 %	5 %	2 %
Fuel oil	4,2	3,7	3,4	1,9	1,0	0,6	0,3	1 %	1 %	0 %	0 %
LPG	50,1	61,5	70,0	44,5	26,0	15,0	9,4	9 %	10 %	4 %	1 %
Electrics	336,1	355,9	369,8	416,7	424,7	421,3	410,8	58 %	55 %	64 %	59 %
Biofuel	0,9	0,8	0,4	0,2	0,1	0,1	0,0	0 %	0 %	0 %	0 %
Biomass/Biogas	27,8	31,3	32,7	38,9	55,0	50,1	44,1	5 %	5 %	8 %	6 %
Geothermal	0,0	0,1	0,6	0,7	0,8	1,9	2,6	0 %	0 %	0 %	0 %
Solar energy	75,3	87,4	106,7	100,4	121,5	170,0	215,4	13 %	16 %	18 %	31 %
Total	**579,5**	**635,4**	**668,2**	**657,2**	**660,5**	**677,2**	**694,0**				
Environmental energy	83,4	112,3	158,2	166,6	175,0	183,3	191,7				
RES rate (%)	43 %	43 %	47 %	58 %	75 %	87 %	93 %				
Share of RES (%) – with ambient energy	57 %	59 %	65 %	75 %	86 %	92 %	96 %				
Greenhouse gas emissions (Mt CO2e)	0,411	0,469	0,459	0,291	0,170	0,098	0,061				

PINAKA 9.6: FINALENERGY CONSUMPTION AND GREENHOUSE GAS EMISSIONS OF THE BUILDING SECTOR IN THE AFM UNTIL 2050.

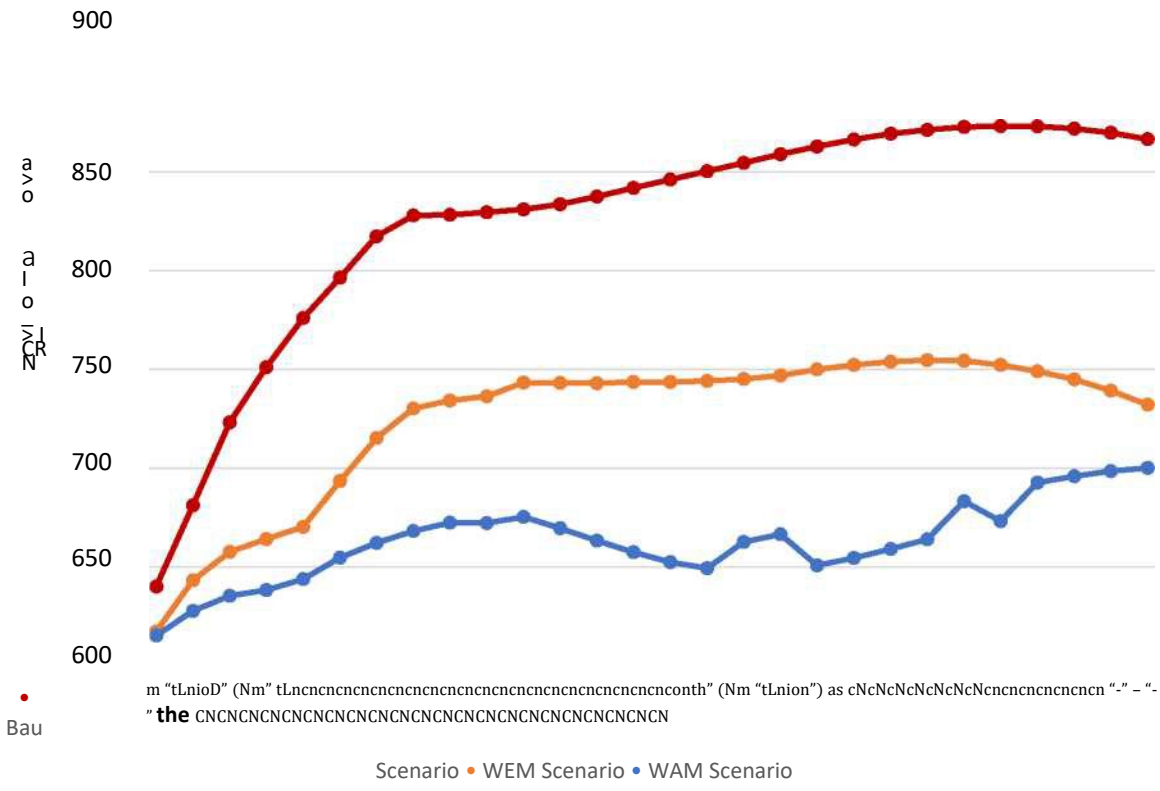
The GHG intensity (direct emissions per unit of GDP) is falling at an even faster pace, as a result of RES penetration and electrification of buildings on the path to climate neutrality in 2050. Chart 10 shows these two key figures, as is expected to evolve for the building sector in the NRCP AFM.



DFYKE 9.1: INCREASINGTHE ENERGY AND GAS EMISSIONS OF THE BUILDING SECTOR, inline with the NECP AFM.

9.3 Comparison of milestones with the latest Long-term Building Renovation Strategy

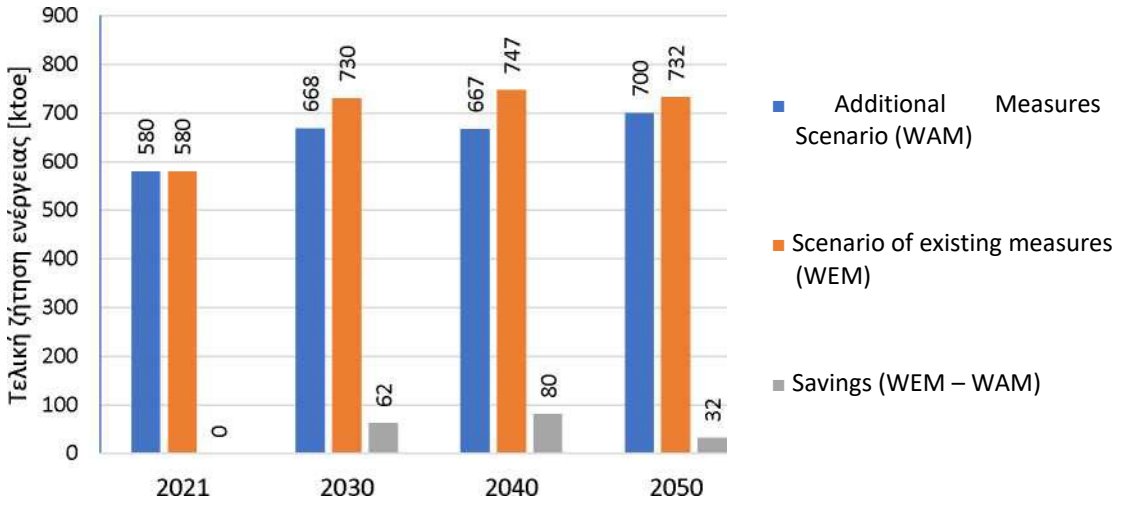
The new roadmap with the expected energy savings up to 2050 presented in Chart 11 is based on the Scenarios of Existing and Additional Measures of the revised NECP. The calculations were made in the context of improving primary consumption in the residential building stock by 16 % in 2030 compared to 2020, and at the same time lead to the achievement of the final energy consumption target – in the residential sector – laid down in Article 4 of the Energy Efficiency Directive (EU) 2023/955.



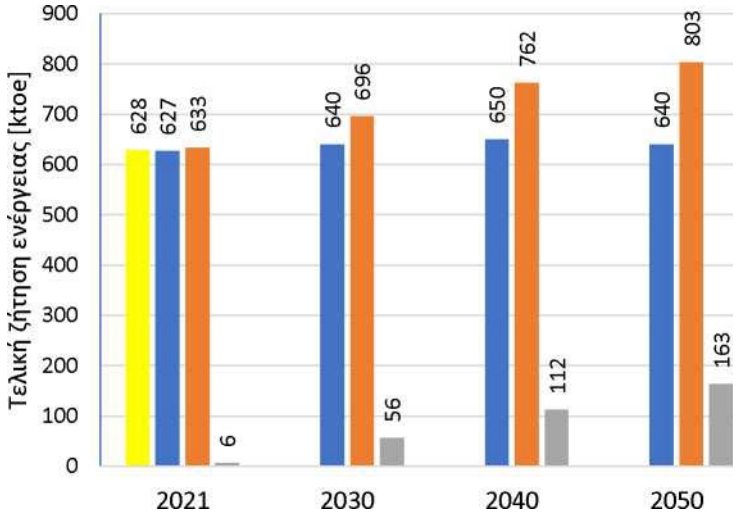
DFYKE 9.2: APPROVALOF THE NECP SCENARIOS FOR FINAL ENERGY CONSUMPTION IN THE BUILDING SECTOR.

The scenariosshow the need for 6200 deep building renovations per year from 2024 to 2030 assuming that the same costs for renovations will continue for the period 2030 – 2050. This objective is considered difficult to achieve because it requires a six-fold increase in the current renovation rate as shown by the ‘Save – Upgrading’ project data, which is the most important measure for implementing renovations. However, the target for deep renovations per year is reduced to 3000 taking into account the existing implementation rates of individual energy upgrading measures for buildings such as roof thermal insulation and installation of PV and solar heaters.

NECP



DFYKE 9.3: GREEKENERGY CONSUMPTION IN BUILDINGS (NECP 2024).



NECP 2020 Auxiliary Energy Consumption 2021 (Eurostat)

The projected energy savings between the two revised scenarios (Chart 12) have decreased

Final consumption 2021 (Eurostat)

Additional Measures Scenario (WAM)

Scenario of existing measures (WEM)

Savings (WEM – WAM)

compared to the corresponding 2020 scenarios (Chart 13), mainly due to the decision to remain at a "realistic" rate of renovations. A further difference between the revised

DFYKE 9.4: GREEKENERGY CONSUMPTION IN BUILDINGS (NECP 2020).

indicative milestones compared to 2020 is that heat pumps are no longer included in final

energy consumption. This difference can be seen by comparing the 2021 primary energy consumption, where in the new scenarios it is reduced by almost 50 ktoe.

Finally, although the actual primary consumption in 2021 is almost the same as the forecast for the AFM, no firm conclusions can be drawn on the validity of the scenarios because the duration of the calculations is very short.

10. Conclusions

The long-term renovation of buildings was drafted on the basis of available statistical data, technical studies and feedback from stakeholders through the prior public consultation and other meetings and consultations carried out in the context of European programmes. The most important conclusions that can be drawn are:

1. The building stock remains energy-intensive. The changes made in the buildings sector by minimum energy performance requirements and sponsorship are significant, but they have only affected a small proportion of buildings currently in place, so that the overall picture in terms of energy consumption does not vary significantly.
2. Renovating buildings into energy class A when carried out as part of a planned renovation is the economically optimal solution in the lifecycle of the building on the investor's side.
3. Points in the lifecycle of the building such as sale, change of use, aesthetic or seismic upgrading can also trigger its energy upgrading. In order to increase the chances of building owners carrying out energy upgrading of buildings at these locations, appropriate synergies should be developed between them.
4. The renovation of a significant part of the existing building stock will not only lead to energy savings but also contribute to adaptation to climate change, reducing human health problems, increasing the competitiveness of the Cypriot economy and reducing the energy costs of households that will help alleviate energy poverty. The above has been quantified and increases the value for money for investment in building renovations, as well as benefits for employment, social cohesion and the environment.

The Long-term Building Renovation Strategy is evolving into a continuous process that helps bring together all stakeholders and make the exchange of knowledge and views more effective. It is a springboard for improving the legal, economic and social framework governing the energy upgrading of buildings, and will continue to contribute to the design and implementation of policies and incentives to align with the Directives on energy efficiency, on the energy performance of buildings and on the promotion of the use of energy from renewable sources and to achieve the objective of climate neutrality by 2050.

Annex I.A: Implementation details of the latest Long-term Building Renovation Strategy.

N/A	Title of Policy Measure	Status of Measure	Category of Measure	Implementing Body	Comment	Budget for a measure (where applicable) [million. EUR [EUR]	Estimated Total investment costs (together with the private contribution) [million. EUR [EUR]	Source of Finance
1.	Minimum energy performance requirements for existing buildings.	In force	Regulatory	Energy Service	See pageA 29.	Not applicable		
2.	Energy Performance Certificates.	In force	Regulatory	Energy Service	See pageA 31.	Not applicable		
3.	Inspection of heating and air-conditioning systems.	In force	Regulatory	Energy Service	See pageA 33.	Not applicable		
4.	Energy saving officers (EPs) in public buildings.	In force	Regulatory	Energy Service	See pageA 80.	Not applicable		
5.	Requirements for technical systems in existing buildings.	In force	Regulatory	Energy Service	See pageA 35.	Not applicable		
6.	Energy audits and energy efficiency contracts.	In force	Regulatory	Energy Service	See pageA 36.	Not applicable		
7.	Seismic upgrading of buildings.	In force	Regulatory	Energy Service	See pageA 39.	Not applicable		
8.	Special buildings.	In force	Regulatory	Energy Service	See pageA 40.	Not applicable		
9.	Reduced VAT rate for residential renovations.	In force	Regulatory, Financial	Tax Department	See pageA 56.	Not applicable		
10.	Smart readiness indicator for buildings.	Ongoing	Digitisation	Energy Service	See pageA 90.	Not applicable		
11.	Regulatory framework for the establishment of 'energy communities' and 'renewable energy communities'	Ongoing	Regulatory	Energy Service	The first communities are expected to be established in 2025. For more details see pagea 92.	Not applicable		
12.	Energy Efficiency Obligation Scheme (EEOS).	In force	Regulatory, Financial	Energy Service	The measure is expected to start in 2023. For more details see pagea 38.	Not applicable	150	Private Finance.
13.	Additional building coefficient for new and renovated buildings (Mandate 1 of 2020).	In force	Regulatory, Financial	Energy Department, Department of Town Planning and Housing	A renewal of the measure is expected in 2024. For more details see pagea 56.	Not applicable	No estimate can be made at that time.	Private Finance.
14.	Action plan for energy upgrading of buildings owned and used by central government.	In force	Building upgrades	Department of Public Works	See pageA 77.	50	50	From the European Recovery and Resilience Facility and national resources.

N/A	Title of Policy Measure	Status of Measure	Category of Measure	Implementing Body	Comment	Budget for a measure (where applicable) [million. EUR [EUR]	Estimated Total investment costs (together with the private contribution) [million. EUR [EUR]	Source of Finance
15.	Implementation of information measures (information campaigns, trainings, workshops, etc.).	In force	For information	Energy Service	See pageA 58.	1,67	1,67	National resources (EUR 0.167 million per year for energy efficiency campaigns)
16.	Project " Save – Upgrading in Housing"	In force	Grants plan, building upgrades	Industry and Technology Service	They are revised and expanded according to their effectiveness. For more details see pagea 50.	115	200	From the Structural and Investment Funds ('TALEIA' programme) and the Recovery and Resilience Facility.
17.	Project " Save – Upgrade to Business and Other Bodies"					50	105	From the European Union's Recovery and Resilience Facility (NextGenerationEU) and national resources.
18.	Grant plans of the RES and Energy Fund to promote energy efficiency investments in the residential, tertiary and public sectors.	In force	Grants plan, building upgrades	Energy Service	It is revised and expanded according to its effectiveness. For more details seepage 45 and 86.	38 + 178 (for PV and solar systems) + 4 (for A.I.)	> 238	
19.	Project " Encouraging the reduction of greenhouse gas emissions in enterprises"	In force	Grants plan, building upgrades	Department of Environment	The measure was announced in February 2024 and will be completed in December 2024. For more details see pagea 56.	30	55	
20.	Individual energy efficiency interventions and energy upgrades in buildings in the wider public sector.	In force	Building upgrades	Organisations in the wider public sector (Schools, Nurses, Local Authorities)	Investments in the public sector will be different from those implemented under Measure 15 'Action Plan for the energy upgrading of buildings owned and used by central government'. For more details see pagea 83.	30 + 50 (CSS)	80	From the Recovery and Resilience Facility, the European Regional Development Fund and national resources.
21.	Plan for RES electricity generation for own consumption	In force	Regulatory	Energy Service.	See pageA 53	Not applicable		
22.	Financial tool (Fund of Funds)	Terminated	Regulatory, Financial	Directorate-General Development	While initially two banks expressed interest in the financial instrument, one withdrew from the process in the early stages citing the difficult economic situation due to the Covid-19 pandemic. The second one did not show the required progress in line with the requirements of the Operational Agreement. Due to the tight deadlines of the Cohesion Policy Funds, the Managing Authority decided to formally terminate the financial instrument in April 2023.	Not applicable		

N/A	Title of Policy Measure	Status of Measure	Category of Measure	Implementing Body	Comment	Budget for a measure (where applicable) [million. EUR [EUR]	Estimated Total investment costs (together with the private contribution) [million. EUR [EUR]	Source of Finance
23.	INTERREG V-A Regional Cooperation Programme Greece – Cyprus 2014-2020.			Directorate-General Development				
	(A) Energy upgrading of the Presidential Palace.	In force		Department of Public Works	It was finished in 2023.	1,4	1,4	
	Project “STRATENERGY”	In force	Building upgrades	Energy Service	For details see pagea 82. In the tendering procedure for finding contractors for the 7 buildings of the project, the Ministry of Commerce and Industry signed a contract only for the building of the Municipality of Geroskipou. The Municipality of Limassol carried out a tendering procedure twice to find a contractor. No bid was received in the 1th tender and one tender was submitted in the 2th tender and was rejected during the evaluation as it did not meet the tender conditions. The Municipality of Limassol, having obtained approval for a reopening of the tender procedure, informed the Ministry of Commerce and Industry on 10/5/2023 that it would not proceed due to short time limits. The Municipality of Athinou informed the Ministry of Industry on 9/2/2023 that it did not wish to proceed with the energy upgrading of its building from the project. The Monitoring Committee for the Programme decided on 16/9/2022 to cut off the physical and financial scope of the building of the Central Offices of the Limassol Amaoutsos Sewerage Board due to the limited budget resulting from the revision of the estimated value of the building upgrades.	1,62	1,62	It is co-financed 85 % by the European Regional Development Fund and 15 % by national resources from Greece and Cyprus.
	Project “COOPERATION”	Terminated		Energy Service	The Programme Monitoring Committee decided in March 2022 not to relaunch the tender and not to implement the pilot/demonstration energy saving projects in the buildings concerning Cyprus, as the two tender notices carried out in the previous period did not submit tenders from contractors for the energy upgrading of the buildings.	Not applicable		
24.	Energy saving tool	In force	Information, Digitalisation	Energy Service.	Upgrades are being made to the tool.	Not applicable		

Annex I.B: Implementation details of new measures listed in the existing Strategy

N/A	Title of Policy Measure	Status of Measure	Category of Measure	Implementing Body	Comment	Budget for a measure (where applicable) [million. EUR [EUR]	Estimated Total investment costs (together with the private contribution) [million. EUR [EUR]	Source of Finance
1.	Recharging stations for electric vehicles in buildings.	In force	Regulatory, Allowance Plan	Energy Service, Department of Electrical and Mechanical Services	See pageA 41.	Not applicable		
2.	Amendment to the Roads and Buildings Regulation Act on the installation of photovoltaic systems	In force	Regulatory	Energy Service	See pageA 40.	Not applicable		
3.	Creation of new software simulating the new (NPRAC).	Ongoing	Digitisation	Energy Service	The software is expected to be completed in 2025. The new NPRAC also includes the evaluation of the smart readiness indicator of buildings. For more details see pagea 31.	0.172	0.172	National resources
4.	Important new measures from the recast Energy Efficiency (2023/1791/EU) and Energy Performance of Buildings Directives (2024/1275/EU)	Under examination	Regulatory, building upgrades	Energy Service	For more details see pagea 63.	No estimate can be made at that time.		
5.	Development of a new digital one stop shop(Doss) online platform for RES projects and building renovation	Ongoing	Digitisation	Energy Service	The measure is expected to be completed in 2024. For more details see pagea 65.	0.331	0.331	Next Generation EU
6.	Advanced smart metering system infrastructure project.	Ongoing	Digitalisation.	Cyprus Energy Regulatory Authority – Distribution System Operator	The measure is expected to be completed in 2026. For more details see pagea 66.	60	60	From the Recovery and Resilience Facility and the EAC budget.
7.	Tax bill on increased capital reductions for energy upgrading of enterprises.	In force	Regulatory, Financial	Tax Department	See pageA 67.	Not applicable		
8.	Creation of a National Development Agency.	Under examination	Regulatory, Financial	Energy Service	It is expected to be operational in 2027. For more details see pagea 67.	No estimate can be made at that time.		
9.	Project "Building" – reconstruction and maintenance of refugee multi-apartment buildings	Under examination	Grants plan, building upgrades	Directorate for Policy, European Affairs, Housing Policy and Human Resources of the Ministry of Finance.	See pageA 68.	130	No estimate can be made at that time.	National resources
10.	Project 'Renaissance – Rent'				See pageA 68.	25		
11.	Emissions trading system in buildings	Under examination	Regulatory	Department of Environment	It is expected to be operational in 2027. For more details see pagea 69.	Not applicable		
12.	Green tax reform	Under examination	Regulatory, Financial	Tax Department	See pageA 70.	Not applicable		

Annex II: Public Consultation —

In order to best shape the Long-term Building Renovation Strategy (NDRC), a public consultation was carried out in the following ways:

1. Presentation to the Advisory Committee on Promotion of Energy Savings in Buildings and Promotion of Zero Energy Buildings of the preliminary report of the technical assistance received by the Ministry for the revision of the DRCD from the Trinomics consultative house in cooperation with the Cyprus Institute and the consultancy firm ideopsis. The topic was presented and discussed at a meeting of the Advisory Committee on 17 May 2023.
2. Public presentation of the draft NECP and the DRCD open to the public. The presentation and discussion took place in the multi-purpose room of the Ministry of Finance on 28 July 2023. During the period of preparation of the draft DRCD, there was communication with bodies other than the Advisory Committee, such as the EAC, the Ministry of Education, Sport and Youth, the Directorate-General for Development, the Statistical Service, the OKPY and the research service of the DEK, which contributed to the formulation of the Strategy.
3. Post the preliminary draft of the DRCD on 28 July 2023, as an annex to the NECP, on the online public consultation platform of the Directorate-General for Development e-consultation.gov.cy/diavouleuseis, where the public can leave their comments by 1July 2024.
4. Presentation and discussion of the draft of the NDCC at the Advisory Committee on Promotion of Energy Saving in Buildings and Promotion of Zero Energy Buildings, which took place at a Commission meeting on 22 September 2023.
5. Participation in the Sustainable Energy Investment Forum on 31 October 2023 at the Hilton Hotel in Nicosia. It was organised by the European Commission in cooperation with the Ministry of Energy, Commerce and Industry and the Ministry of Finance, with the support of the Cyprus Association of Energy Saving Enterprises (PASEEXE), a member of the Federation of Employers and Industrialists (OEB). It aimed to foster dialogue between key stakeholders in the area of financing energy efficiency and energy saving projects. The summary of the conclusions of the conference can be found in Annex II.A.
6. Meeting with the Ministry of the Interior on the New Single Housing Policy and how it relates to the improvement of the energy performance of existing buildings. The first meeting took place on 7 November 2023.
7. Bilateral meetings with stakeholders and services to consult NECP policy measures to improve the energy performance of existing buildings. The first series of meetings involving the Energy Service took place on 9 November 2023, with the participation of the Ministry of Industry and Technology, the Directorate-General for Development, the Ministry of Finance, the Department of Public Works and the Ministry. Transport of

Communications and Works, on Section Electromechanical services, the Fire Brigade, on Section Urban planning and housing, the Environment Department, the Human Resources Development Authority and representatives of the Union of Communities. The second series of meetings took place on 21 December 2023, with the participation of OKPY, the Association of Municipalities, the Municipality of Nicosia and the Municipality of Strovolos.

8. Participation in a discussion of the Focus Group on "The needs of the Cypriot economy in green occupations and skills" on 20 December 2 023 in the AnAD event room. It aimed to capture the status quo and the actions needed for the transition of the economy to a sustainable growth model as well as the emerging needs in green occupations and skills. The draft conclusions of the discussion are set out in Annex II.B.
9. Meeting with the Ministry of the Interior on 25 January 2024 where they were informed of the articles of the recast Directive concerning them. The Energy Service (OP) was informed about the 'Hippedos' information system for the management of building permits and the possibility of its interoperability with the Energy Certification System for Buildings of the OP. The meeting took place on 25 January 2024.
10. Meeting with the Cyprus Federation of Building Contractors (OEK), where the preliminary draft of the NDCC was presented and issues relating to building renovations and the revision of the Directive were discussed. The meeting took place on 20 February 2024 and its minutes are set out in Annex II.C.
11. Meeting with the Federation of Employers and Industrialists of Cyprus (OEB), where the preliminary draft of the DRCD was presented and issues were discussed concerning the renovations of buildings owned or used by SMEs, the perceived lack of human resources and ensuring the implementation of the EPC measures. The meeting took place on 7 March 2024 and its minutes are set out in Annex II.D.
12. Meeting with the Scientific Technical Chamber of Cyprus (ETEK), where the preliminary draft of the NDCC was presented and issues related to building renovations, ensuring the implementation of the EPC measures and revision of the Directive were discussed. The meeting took place on 3 April 2024 and its minutes are set out in Annex III.
13. Participation in the meeting of the Technical Committee 2 (Energy Efficiency) of the National Governance System for the Development Strategy in relation to the Green Deal. The meeting took place on 17 May 2024 and its minutes are set out in Annex II.F.
14. Conduct a targeted questionnaire on issues related to energy renovations of buildings. The results of the questionnaire are presented in Annex II.G.
15. National and international fora and roundtables in which the Energy Service participated are listed in Annex II.h.

Annex II.A: Sustainable Energy Investment Forum conference organised by the European Commission in cooperation with the Ministry of Mercantile Marine

The main conclusions reached during the parallel workshops are:

Workshop 1: Improvement of banking products for residential renovation.

1. Tax disincentives for the construction of new buildings/dwellings may need to be implemented alongside tax incentives for building renovations. It is important for sponsorship not to subsidise fossil fuel technologies.
2. There is a need to educate end-users and banking institutions' employees to understand the energy savings from energy renovations as well as the other resulting benefits (renovation with increased building/house value, climate proofing, thermal comfort, increased productivity, health benefits, etc.).
3. Banking products for such investments could offer lower interest rates and banks could set up info hubs to inform and guide their customers on available financial tools/plans for building renovations.
4. There is liquidity and will on the part of banking institutions, but a framework should be found to promote more energy upgrades.
5. An incentive framework for energy renovations combining sponsorship with favourable lending and tax relief could be considered.
6. It is imperative to promote ESCOs, information campaigns, frequent stakeholder meetings and possible grouping of projects.
7. Incentives are needed to help reduce the time taken to implement energy upgrades.

Workshop 2: Financing for energy efficiency in Industry and Small and Medium-sized Enterprises (SMEs)/Promotion of Energy Services.

1. The citizen, whether as an individual or as an entrepreneur, needs solutions that offer energy savings without hindrance. The RIS model concerns large projects and consumers as it requires the involvement of legal, financial, insurance and technical issues – making the process complex for individuals or SMEs. Nevertheless, it is a model that could be used as an integrated solution in cases where the client has other investment priorities to invest equity and does not have the necessary time or know-how to deal with the technical issues.
2. With regard to RZs, problems were identified such as bank financing models, lack of state guarantees, failure to fully inform banks of what the RSP is, and how to ensure that litigation can be avoided in cases where the customer does not pay.
3. Perhaps in the future, with the liberalisation of the electricity market, energy providers could also act as RUs by providing ES measures, so that the amount of savings due to the measures provided by the customer is deducted from the customer's energy tariff.

4. For the on-bill scheme launched by the Ministry of Finance, the discussion showed that there are some legal issues regarding the role of the Distribution System Operator (DSO) and the fact that charges may not be applied to the tariff that are not directly related to electricity consumption, which requires separate meetings with the bodies directly involved in order to paralyse the correct actions.

Annex II.B: Debate of the Focus Group on "The needs of the Cypriot economy in green occupations and skills" organised by the NDA

The main conclusions that emerged during the debate were:

Targets:

1. Achieving climate neutrality by 2050.
2. Making the EU a leader in green growth, innovation and the economy.
3. Enhancing the EU's energy efficiency.
4. Increasing the share of energy from renewable sources.
5. Ensuring the EU's energy security and independence.

Challenges:

1. Significant investment in people and upskilling.
2. There are shortages of adequately trained human resources in many areas such as Construction, Tourism, Informatics and Industry.
3. There is a close link between the green and digital economies. One example is the use of BIM (Building Information Modeling) systems in the construction sector as well as in building licensing and control procedures.
4. The absence of a formal system of classification and distinction of green professions makes it difficult to identify and promote green professions.
5. There is a need to retrain and upgrade the knowledge of existing workers.
6. Participation in education and training activities remains low over time.
7. A redirection of the professional activity of certain economic activities is required due to the gradual shift away from fossil fuels.

Proposed Actions:

1. Implementation of green skills training programmes.
2. Promoting a culture of lifelong learning.
3. Upgrading of Technical Schools and Apprenticeship Schools.
4. Recognition of micro-credentials and informal and non-formal learning from the labour market.
5. Forecasts of human resources needs should take into account the long-term strategies of the State.

Opportunities:

1. Creating new jobs in green activities.
2. Strengthening the competitiveness of enterprises.
3. Improving the quality of life and protecting the environment.

Major economic activities with growth prospects:

1. Photovoltaic systems and energy storage technologies.
2. Energy efficiency technologies and systems.
3. Energy transmission system management.
4. Implementation of environmental legislation and inspections.
5. Maintenance of vehicles with electric and hybrid engines.
6. Energy and building renovations.
7. Waste management.

Annex II.C: Minutes of meeting with the Federation of Associations of Contractors Cyprus Building (OEEC) on 20 February 2024

PRESENT

Nikos Chatzinikolaou	Energy Service
Panagiotis Konstantinou	Energy Service
Yiannos Poupouris	Director of OEEC
Despo Artemiou	OSE Official

The meeting took place in the context of the public consultation of the Long-term Building Renovation Strategy (NDRC), which will be submitted as an annex to the National Energy and Climate Plan (NECP) to the European Commission in June 2024.

Topics of the meeting were:
1. Presentation of the Preliminary Draft of the NDCC.
2. Information on the revision of the Energy Efficiency of Buildings Directive.

After welcoming those present, Mr Chatzinikolou briefly mentioned the topics of the meeting and the role of OSE in shaping the CDCC as a party directly involved in building renovations. The OEEC representatives confirmed their availability to contribute to the formulation of the Strategy.

Mr Konstantinou then presented the draft of the revised NDCC, including the following:
1. The role of buildings in achieving the national energy consumption and greenhouse gas emission reduction targets, as well as in the penetration of RES into final consumption as set out in the NECP.
2. The objective of the NDCC, which is to facilitate the cost-effective transformation of existing buildings into Zero Energy Buildings (NZEB), and the important points it contains. The aim is to renovate 3000 buildings per year per year of the period 2024 – 2030, in private dwellings, businesses, the public sector and vulnerable households. This objective, although considered difficult to achieve, does not seem sufficient to achieve a decarbonised building stock by 2050.
3. The Energy Efficiency Directive has been reformulated and the obligation to renovate public buildings will concern the entire public sector and will not be limited to central government as is currently the case. In addition, public buildings should be renovated to NZEBs or zero-emission buildings.
4. Minimum energy performance requirements, issuing EPCs and sponsorship plans for energy upgrading of buildings are considered the most important measures to improve the energy performance of the building sector.
5. The problems, obstacles and dilemmas recorded in the LCC, such as lack of funding, conflicting interests in rented and multi-apartment buildings, lack of human resources, on which we want to focus through public consultation.

During the presentation:
1. The complexity of the new Grant Plans of the New Housing Policy of the Ministry of the Interior, notably as regards new buildings. The initial assessment of the OEEC is that there will be a reduced interest by contractors in participating due to the reduced budget included in the project. The 'Renaissance – Rental' project is addressed to owners of existing buildings and not directly to OEEC members.
2. The lack of human resources for building renovations can be addressed once it is regulated by

market conditions.

3. Quality assurance in the renovation of existing buildings can be achieved through specialised certification of contractors and/or companies for renovations. This certification may be necessary for a contractor as a provider of renovation services to enter the Digital One Stop Shop, implemented by the Ministry of Mercantile Marine.
4. The green tax reform seems mainly to be implemented through the introduction of a carbon tax on motor and heating fuels. It may also include tax relief for investments in energy upgrades or measures to reduce greenhouse gas emissions.
   In some cases the effect of competition on the market is negative in terms of the application of minimum energy performance requirements. In cases where minimum requirements such as the maximum energy demand for heating or the maximum primary energy consumption is 100 kWh/(m²· year) are not met, the owners are difficult to see the need to apply thermal insulation of the envelope beyond the individual thermal insulation requirements.
5. The positive view of OEEC on ensuring the EPC measures and recommendations when their audit/inspection is a prerequisite for the electrification or water supply of a new building. In addition, the assurance can be achieved through the issuance of an EPC “as built” of the building.

The main conclusions of the meeting were:

1. The sectors of construction of new buildings and renovation of existing buildings are interdependent and it is not realistic to develop both at the same pace, neither at the level of the economy nor at the level of the labour force, without at the same time depriving other sectors of the economy of resources.
   To increase the rate of building renovations, funds need to be transferred, through incentives and disincentives, from the new building sector to the renovation sector of existing buildings. This transfer of funds will also lead to an increase in jobs for human resources specialised in energy renovations.

2. As regards conflicting interests in multi-ownership buildings, changes are needed in the legislation on rent control and on co-ownership in buildings and management committees.

Please find attached the presentation of the Energy Service.

Panagiotis Konstantinou
Energy Service
Ministry of Energy, Commerce and Industry
21 February 2024
Ref. No.: 05.21.006.011

Annex II.D: Minutes of the meeting with the Cyprus Federation of Employers and Industrialists (OEB) on 7 March 2024

PRESENT

Nikos Chatzinikolaou	Energy Service
Panagiotis Konstantinou	Energy Service

Panagiotis Kastania	Senior OEB Officer
Yannis Canaris	OEB Officer
Nikolas Nikolaou	OEB Officer

The meeting took place in the context of the public consultation of the Long-term Building Renovation Strategy (NDRC), which will be submitted as an annex to the National Energy and Climate Plan (NECP) to the European Commission in June 2024.

Topics of the meeting were:
3. Presentation of the Preliminary Draft of the NDCC.
4. Information on the revision of the Energy Efficiency of Buildings Directive.

After welcoming those present, Mr Chatzinikolou briefly mentioned the topics of the meeting and the role of the EBA in accelerating the pace of renovations and transforming the building stock into zero emissions. EBA representatives confirmed their availability to contribute to the formulation of the Strategy and the success of the objectives.

Mr Konstantinou then presented the draft revision of the NDCC, including the following:
6. The role of buildings in achieving the national energy consumption and greenhouse gas emission reduction targets, as well as in the penetration of RES into final consumption as set out in the NECP.
7. The objective of the NDCC, which is to facilitate the cost-effective transformation of existing buildings into Zero Energy Buildings (NZEB), and the important points it contains. The aim is to renovate 3000 buildings per year per year of the period 2024 – 2030, in private dwellings, businesses, the public sector and vulnerable households. This objective, although considered difficult to achieve, does not seem sufficient to achieve a decarbonised building stock by 2050.
8. The Energy Efficiency Directive has been reformulated and the obligation to renovate public buildings will concern the entire public sector and will not be limited to central government as is currently the case. In addition, public buildings should be renovated to NZEBs or zero-emission buildings.
9. Minimum energy performance requirements, issuing EPCs and sponsorship plans for energy upgrading of buildings are considered the most important measures to improve the energy performance of the building sector. Measures under implementation of the online platform for building renovations and the installation of smart metering systems for electricity consumption in buildings are equally important.
10. The problems, obstacles and dilemmas recorded in the LCC, such as lack of funding, conflicting interests in rented and multi-apartment buildings, lack of human resources, on which we want to focus through public consultation.

The presentation discussed the issues of lack of sufficient human resources for renovations, problems in building renovations with a focus on those owned or used by SMEs and ensuring the implementation of the EPC measures and recommendations.

As part of the discussion, the following contributions were submitted by the OEB, which were subsequently sent in writing:

As regards the perceived shortage of human resources:

3. To hold a joint meeting with the Ministry of Labour, Ministry of Labour and other associations of OEB members facing the same problem. The aim will be to record the needs for occupations/specialisations that result in a shortage of human resources.
4. Implement more flexible, digitalised and efficient procedures for the employment of foreigners from third countries to enable them to work and meet part of the needs of businesses/industries, which cannot be met by Cypriot or European citizens.
5. Extend the list of professions for political asylum applicants and foreigners to include sectors directly related to the green transition and the transformation of the building stock into zero emissions.
6. Link the Certificates of Professional Qualifications (PEP) of the ADA for enrolment in registers of installers as defined in the legislation.
7. Carry out programmes for training, upskilling and reskilling of buildings mainly for engineers.
8. Ensure the provision of specialised training programmes to ensure that all sectors have access to a skilled workforce, which is needed to effectively improve energy efficiency. In the event that private training organisations do not include relevant programmes, the Ministry of Mercantile Marine is responsible for organising them in cooperation with private organisations.

As regards problems with renovations of buildings owned or occupied by SMEs: 1. To plan targeted information campaigns to promote energy saving sponsorship, technology and investment projects by the Ministry of Mercantile Marine, in cooperation with the OEB. Campaigns can be targeted at Associated OEB members and/or affected bodies with a focus on the rewarding benefits of implementing energy saving measures in SMEs and examples from investments that have already been successfully implemented.

2. Review the way bank finance is assessed in order to provide more favourable lending conditions for investments in energy-saving measures.
3. Simplify the procedures for applying for sponsorship. Have a single body and/or a common framework for providing funding for energy saving and building renovation measures.
4. It may be that the granting of capital reductions (tax relief) to investments in energy saving and RES use in buildings, both in the residential and non-residential sectors, is preferable and more efficient than the grant plans.
5. To be able to participate in sponsorship projects also for SMEs not housed in owned buildings.
6. To be able to grant public subsidies to grouped energy upgrading projects such as on commercial roads or from a set of SMEs.
7. Focus on sponsorship plans for individual energy upgrading measures whose implementation does not disrupt the operation of the company.

With regard to ensuring the implementation of the measures and recommendations of the SMO:

1. A stricter and more frequent enforcement check is carried out on platforms for buying, selling and renting buildings with regard to the demonstration of the EPC.
2. Redesign the EPC to make it more user-friendly and easier to understand for citizens.
3. Link the issuance of EPCs to the provision of public utilities (water, electricity), the rental contract and the provision of bank loans.
4. Audit of the implementation of EPC measures by external engineers.

Please find attached the presentation of the Energy Service.

Panagiotis Konstantinou
Energy Service
Ministry of Energy, Commerce and Industry

20 March 2024
Ref. No.: 05.21.006.011

Annex II.E: Minutes of the meeting with ETEK on 10 April 2024

PRESENT

Charalambos Rousos Nikos	Director of the Energy Service
Chatzinikolaou Panagiotis	Energy Service
Konstantinou	Energy Service
	B Vice-President ETEK
	Treasurer ETEK
	Member of ETEK Steering Committee
Elisabet Vassiliou Eleni	Member of ETEK General Council
Christodoulou Thoma Sokratis	Member of ETEK General Council
Zavros Georgiou Chrysanthos	Member of ETEK General Council
Maroussos Christos Maxoulis	Senior Scientific Official ETEK
Haris Stavrianou Eleni	ETEK Official
Maimaris Nikolaidis	ETEK Official
	Member of ETEK

The meeting took place in the context of the public consultation of the Long-term Building Renovation Strategy (NDRC), which will be submitted as an annex to the National Energy and Climate Plan (NECP) to the European Commission in June 2024.

Topics of the meeting were:
5. Information on the revision of the Energy Efficiency of Buildings Directive.
6. Presentation of the Preliminary Draft of the NDCC.

After welcoming us to their premises, the representatives of ETEK confirmed their availability to contribute to the formulation of the Strategy and to informing their members about the topics of the meeting. After thanking the acceptance of the meeting, Mr Roussos referred to the role of ETEK – as technical advisor to the State – in shaping and revising policies and institutions for saving energy in buildings and accelerating the pace of renovations.

Initially, Mr Hatzinikolaou presented the Directive under revision, including the following:
1. The aim of the European Commission's proposal to contribute to reducing emissions in the building sector by 60 % by 2030 and climate neutrality by 2050.
2. The use of a harmonised scale of energy efficiency classes in EPCs across the European Union.
3. The transformation of the building stock into zero-emission.
4. The calculation of the life-cycle carbon emissions of all new buildings according to a common methodological framework.
5. The removal of incentives for the installation of fossil fuel boilers from 2025.
6. The application of minimum energy performance standards for non-residential existing buildings with a view to driving energy renovations to the worst performing buildings.
7. The progressive renovation of part of the residential building stock into Zero Emission Buildings, in accordance with a national roadmap of the 'National Renovation Plan'.
8. The operation of technical assistance facilities, including through inclusive one-stop-shops for the energy performance of buildings.

9. The mandatory application of the Smart Readiness Indicator (SRI) for buildings with an air-conditioning system of more than 290 kW
10. New increased obligations to install electro-mobility infrastructure depending on the type and parking spaces of the building.
11. The requirements for the review and modernisation of the EPC.

12. Improving and introducing new sources of financing to increase the pace of renovations.

This was followed by a presentation by Mr Konstantinou on the draft Building Renovation Strategy, including the following:

1. The role of buildings in achieving the national energy consumption and greenhouse gas emission reduction targets, as well as the penetration of RES into final consumption as set out in the NECP.
2. The objective of the NDCC, which is to facilitate the cost-effective transformation of existing buildings into Zero Energy Buildings (NZEB), and the important points it contains. The aim is to renovate 3000 buildings per year per year of the period 2024 – 2030, in private dwellings, businesses, the public sector and vulnerable households. This objective, although considered difficult to achieve, does not seem sufficient to achieve a decarbonised building stock by 2050.
3. The Energy Efficiency Directive has been reformulated and the obligation to renovate public buildings will concern the entire public sector and will not be limited to central government as is currently the case. In addition, public buildings should be renovated to NZEB or KME.
4. Minimum energy performance requirements, issuing EPCs and sponsorship plans for energy upgrading of buildings are considered the most important measures to improve the energy performance of the building sector. Measures under implementation of the online platform for building renovations and the installation of smart electricity metering systems in buildings are equally important.
5. The problems, obstacles and dilemmas recorded in the DRR, such as the need to strengthen the EPC in the real estate market, conflicting interests in rented buildings and multi-apartment buildings and the lack of human resources, on which we want to focus through the public consultation.

In the context of the discussion that followed, the following were mentioned with regard to strengthening the EPC in the real estate market and ensuring its implementation:

1. The EPC must be verified, otherwise it should only be considered as a study energy efficiency.
2. The verification of the EPC must be carried out by the same expert Expert (EE) who issued it.
3. Make it mandatory to oversee the implementation of the SMO and the recommendations by the EU in order to assume responsibility for its implementation.
4. Link the EPC to the certificate of final approval of the building.

Please find attached the presentations by the Energy Service.

Panagiotis Konstantinou
Energy Service
Ministry of Energy, Commerce and Industry
3 May 2024
Ref. No.: 05.21.006.011

Annex II.F: Minutes of meeting with Technical Committee 2 (Energy Efficiency) of the National Governance System for the Development Strategy in relation to the Green Deal on 17 May 2024

Attended	
Katerina Piripitsis	Energy Service
Christodoulos Ellinnopoulos	Energy Service
Evangelos Stougiannis	Energy Service
Panagiotis Konstantinou	Energy Service
Markos Danglas	Energy Service
Andreas Lizidis	Industry and Technology Service
Elisa Petrides	Ministry of Finance
Aliki Sergi	Ministry of Finance
Soula Karra	Cyprus Energy Office
Savvas Vlachos	Cyprus Energy Office
Christiana Georgalidou	Interior
Stefanos Georgiadis	Department of Urban Planning and Housing
Antoniou Antoniou	Department of Water Development
Epitrou Petrou	Municipality of Latsia
Christiana Kouzaris Athanasatu	Municipality of Larnaca
Valantos Haritou	Municipality of Larnaca
Maria Loizou	Department of Environment
Marios Papanikolaou	Department of Environment
Morotos Patos	State Health Services Organisation
Maria Chine	Department of Urban Planning and Housing
Peace Giannakou	Department of Urban Planning and Housing
Maria Kamenu	Department of Public Works
Elena Anastasiadou	Department of Public Works

Initially, after welcoming and thanking all participants for their response, the representative of the Energy Service (HR) Ms Piripizsis said that this meeting is the second meeting of the Technical Committee 2 (TE2) set up within the framework of the national governance system for development strategy in relation to the European Green Deal. Noted that the main objective of the meeting was to update and confirm existing measures and collect additional information on new measures that might be added to the final National Energy and Climate Action Plan (NECP) which should be submitted to the European Commission in June 2024. Mr Ellinopoulos then briefed on the main new national energy efficiency targets and obligations, based on the new Energy Efficiency Directive.

Mr Konstantinou then informed about the revision of the Energy Performance of Buildings Directive and the long-term building renovation strategy. Mr Stougiannis also presented the tables for the calculation of the mandatory cumulative end-use energy savings target for 2021 – 2030 and highlighted the obligation to achieve 15.1 % of that target among people affected by energy poverty, vulnerable customers, people in low-income households and, where applicable, people living in social housing. It also presented the existing energy saving measures (**Annex 1**) included in the draft NECP and the new measures (**Annex 2**) identified as being being implemented and which could possibly be included in the final NECP, provided that the required data are collected (**Annex 3**). This was followed by a discussion with those present on the existing measures concerning them and on all new measures with the exception of the 2 measures concerning the Municipality of Western Limassol, which was not represented at the meeting.

Ms Aliki Sergi from the Ministry of Finance informed about the establishment of the National Development Agency in which she stated that, as part of its operation, among other financial tools, the financing tool “On bill Scheme” will be launched as a financing mechanism for energy service providers and can offer the energy savings targets. However, as this tool is not expected to be in place before 2027 and for the time there is no specific information, it cannot be included in the measures to achieve the mandatory cumulative target at this stage. Its inclusion in the framework of the 2-year progress reports to be submitted to the European Commission in 2025 or 2027 will be reviewed.

Ms Loizou from the Department of Environment informed those present of the project ‘Encouraging the reduction of greenhouse gas emissions in businesses’. It stated that the measure is divided into 2 phases and for the time being in 1^{the} ongoing phase concerning the submission of applications for approval to carry out an action plan study, there is less interest for businesses to participate. To date, around 70 applications have been submitted out of a total of around 300 applications that may be submitted. ^{The} 2 phase related to the implementation of the action plans is expected to start in 2025. The HR will be contacted by telephone to make reasonable estimates of the energy savings

that the Plan can bring about.

From the Department of Town Planning and Housing (TPO), Mr Georgiadis mentioned the 'renovate – rent' plans of the Ministry of the Interior, incentives for affordable housing to grant an additional building rate of between 25 % and 45 % and Order 1 of 2020 granting an additional building rate of 5 %. As these plans seem, apart from the measure on the additional building factor already included, they cannot currently be included in the NECP either because reasonable estimates of their energy savings cannot be made or because they are at an early stage of implementation. The implementation of Order 1 of 2020 has been extended until the end of 2024. Please note that the HR's intention is to renew the measure of Mandate 1 of 2020 to apply only to existing buildings in cases of additions/conversions combined with energy upgrading.

On behalf of the TPO, Ms Giannakou informed those present of the 'building Zo' project. The project involves carrying out a static study of 358 multi-apartment homes of displaced persons, of whom 43 have so far been declared demolished and new ones will be built. This plan appears to be included in the NECP as some multi-apartment buildings to be built will be more energy efficient than the minimum set by the legislation. In addition, it appears that this measure can also contribute to the achievement of the 15.1 % share of the mandatory cumulative energy poverty target, as many of the project beneficiaries are expected to fall into this category. To this end, a meeting between the CCS and the HR will be held for further information and data collection.
Ms from the Department of Public Works (TDE) stated that there are measures implemented in transport that offer energy savings. A meeting between the SIP and the HR will be re-arranged to collect the data required for the NECP and calculate the resulting energy savings.

Ms Anastasiadou from the TDE stated that there is no progress on the energy upgrading of public buildings, as there are obstacles related to the impossibility of finding suitable spaces for rehousing of sections and services during the execution of the energy upgrading works. A meeting between the QC and the HR will be rearranged to further discuss the issue. The HR noted the need to find solutions, as it is an obligation under the Energy Efficiency Directive to renovate 3 % of buildings that are heated and cooled every year.

Ms Karra, from the Cyprus Energy Office (GEA), presented the 'PEDIA' project, which aims at the energy upgrading of 25 schools. The NVO, as coordinator of the project, acted as the Contracting Authority in undertaking the development of the project concept, the claim for funding, the study,

evaluation and selection of schools, the design of interventions, but also the tendering, award, implementation, monitoring and supervision of public contracts. “Through the Cohesion Policy Programme, “Thalia 2021-2027”, the construction part of the project is co-financed, while the technical support part is funded through the European Union’s PDA (Project Development Assistance) programme of Horizon 2020, and the PEDIA project.” The project is a good practice of a public-private partnership for public building renovation procurement. It may be included in the NECP and for this purpose, if necessary, a meeting will be held between the HVO and the HR in order to collect additional information from what has already been sent by the HVO to the HR. In addition, it was reported that there are other relevant measures about which they may inform the HR.

Mr Pasos from the Organisation for State Health Services (OYY) stated that hospital upgrades are being carried out, but because of the specificity of the upgrades, it is necessary to cooperate with the HR so that it can be seen which upgrades will be taken into account and how energy savings will be quantified. To this end, an additional meeting between the CSO and the HR will be arranged. Mr Antoniou from the Water Development Department (WDD) spoke about energy-saving measures in the water sector. He stated that there are some actions implemented and related to energy savings, and to this end a meeting will be arranged between the DYY and the HR to collect additional information and data.

Ms Athanasatos from the Municipality of Larnaca stated that there are currently no projects implemented by the Municipality that could contribute to the achievement of the national energy saving targets.

Ms Petrou on behalf of the Municipality of Lazio stated that energy-saving actions are being implemented in buildings in the municipality. There are measures that could be included in the NECP and for this purpose a meeting will be arranged between the Municipality of Lazio and the HR to collect additional data.

Mr Lizidis, from the Department of Industry and Technology (HTI), indicated that he would send the HR additional information on the Savour-Upgrade grant plans for homes and businesses, so that the energy savings units resulting from these projects could be estimated. In addition, preliminary data/estimates will be sent for the new sponsorship plan for energy upgrading and strengthening the competitiveness of large enterprises recently announced by the HBT.

28 May 2024

Ref. No 4.2.15.20.50.2.2

Annex 1.

Existing measures to achieve the mandatory cumulative end-use energy saving target for the period 2021-2030 included in the draft NECP (savings per measure will be revised as part of the preparation of the final NECP – June 2024).

N/A	Title of Measure	Implementing Body	Implementation period	Expected cumulative energy savings by double metering	Expected cumulative energy savings without exhaust double-counting	Contribution to the objective (349,04 ktoe) by double-counting energy savings	Contribution to the target (349,04 ktoe) without double-counting energy savings
				2021 – 2030 (ktoe)	2021 – 2030 (ktoe)		
1	Energy Efficiency Obligation Scheme (EEOS).	Ministry of Energy, Commerce and Industry	2023 – 2030	100,01	100,01	28.65 %	28.65 %
2	Additional building factor for new and renovated buildings.	Ministry of the Interior (Department of Urban Planning and Housing)	2014 – 2024	6,26	6,26	1.79 %	1.79 %
3	Individual energy efficiency interventions and energy upgrades in selected state buildings	Department of Public Works and Department of Electrical and Mechanical Services	2021 – 2030	14,95	14,95	4.28 %	4.28 %
4	Implementation of soft measures (information campaigns, trainings, workshops, etc.).	Ministry of Energy, Commerce and Industry	2021 – 2030	2,78	0,00	0.80 %	0.00 %
5	European Regional Cooperation Programme INTERREG V-A Greece – Cyprus 2014-2020.	Ministry of Energy, Commerce and Industry	2018 – 2023	0,75	0,75	0.22 %	0.22 %

N/A	Title of Measure	Implementing Body	Implementation period	Expected cumulative energy savings by double metering	Expected cumulative energy savings without exhaust double-counting	Contribution to the objective (349,04 ktoe) by double-counting energy savings	Contribution to the target (349,04 ktoe) without double-counting energy savings
				2021 – 2030 (ktoe)	2021 – 2030 (ktoe)		
6	'Save – Upgrade in Housing' grant plan	Ministry of Energy, Commerce and Industry	2021 – 2027	75,52	75,52	21.64 %	21.64 %
7	Grant Plan "Save – Upgrade to Business and Other Bodies"	Ministry of Energy, Commerce and Industry	2023 – 2026	40,00	40,00	11.46 %	11.46 %
8	Energy upgrading of hospitals and/or hospital units and construction of new energy-efficient hospitals and/or hospital units	State Health Services Organisation	2021 – 2026	1,12	1,12	0.32 %	0.32 %
9	Grant Plan "Encouraging the reduction of greenhouse gas emissions in enterprises"	Department of Environment	2023 – 2030	31,33	31,33	8.98 %	8.98 %
10	Individual energy efficiency interventions and energy upgrades in buildings in the wider public sector.	Bodies of the wider public sector (municipalities, communities, etc.)	2021 – 2026	1,30	1,30	0.37 %	0.37 %
11	RES and Energy Fund allocation plans to promote energy efficiency investments in	Management Committee of the DPE and EXE Fund	2021 – 2026	23,95	23,95	6.86 %	6.86 %

N/A	Title of Measure	Implementing Body	Implementation period	Expected cumulative energy savings by double metering	Expected cumulative energy savings without exhaust double-counting	Contribution to the objective (349,04 ktoe) by double-counting energy savings	Contribution to the target (349,04 ktoe) without double-counting energy savings
				2021 – 2030 (ktoe)	2021 – 2030 (ktoe)		
	residential, tertiary and public sectors.						
12	Energy-efficient street lighting.	Ministry of the Interior, EAC Municipalities/Communities, Electromechanical Services	2018 – 2024	9,91	9,91	2.84 %	2.84 %
13	Advanced measurement infrastructure project	Cyprus Energy Regulatory Authority – Distribution System Operator	2021 – 2030	10,32	0,00	2.96 %	0.00 %
14	Energy saving measures in the road transport sector.	Ministry of Transport, Communications and Works.	2021 – 2030	29,75	0,00	8.52 %	0.00 %
15	Energy efficiency in the water sector.	Department of Water Development	2021 – 2030	0,80	0,80	0.23 %	0.23 %
16	Energy consumption fee applied to electricity	Management Committee of the DPE and EXE Fund	2021 – 2030	19,17	7,01	5.49 %	2.01 %
17	Excise duty on road transport fuels exceeding the minimum levels required by Directive 2003/96/EC.	Ministry of Finance	2014 – 2030	82,37	82,37	23.60 %	23.60 %

N/A	Title of Measure	Implementing Body	Implementation period	Expected cumulative energy savings by double metering	Expected cumulative energy savings without exhaust double-counting	Contribution to the objective (349,04 ktoe) by double-counting energy savings	Contribution to the target (349,04 ktoe) without double-counting energy savings
	Cumulative savings in every year (ktoe)			2021 – 2030 (ktoe)	2021 – 2030 (ktoe)		
				450,28	395,28	129.01 %	113.25 %

Annex 2

New measures and measures under investigation to achieve the mandatory cumulative end-use energy saving target for the period 2021 – 2030

1. Achieving the share of the mandatory cumulative energy saving target among people affected by energy poverty, vulnerable customers, etc. – **YEEB, RES and Energy Fund.**
2. Grant Plan 'Renaissance – Rent'. — **Ministry of the Interior.**
3. Reconstruction and maintenance of refugee multi-apartment buildings ('Building' project) – **Ministry of the Interior.**
4. Sponsorship plan to upgrade energy and strengthen the competitiveness of large enterprises – **MEEB.**
5. Green Tax Reform. — **Ministry of Finance**.
6. Establishment of the National Development Agency. — **Ministry of Finance.**
7. Draft law deposited with the BtoA on tax exemptions for companies carrying out energy upgrades. — **Ministry of Finance.**
8. PEDIA project. — Ministry of Education.
9. Energy upgrade sponsorship of 500 dwellings to low-income residents. — **Municipality of Western Limassol.**
10. Energy upgrade of 15 municipal buildings. Local government – **Municipality of West Limassol.**
11. Energy upgrade of 4 municipal buildings/facilities – **Municipality of Lazio.**
12. Energy upgrading works of existing public buildings. — **New Metropolitan Municipality of Larnaca.**

Annex 3

Data required for the inclusion of the new measures to be included in the NECP and for the preparation of the 2-year progress report.

1. Description of the measure.
2. The budget for the implementation of the project.
3. The list of energy upgrades of buildings and/or other HE measures included in the project and where applicable.
4. The timetable for implementation and completion of upgrades and/or other measures.
5. The source of financing. In the case of EU co-financing, indicate the amount and the fund from which it comes.
6. The individual actions/interventions eligible for funding (e.g. roof thermal insulation, replacement of frames, installation of PV systems, etc.) and where applicable.
7. The estimated energy savings per building per year in final and primary use where data are available.
8. Responsible authority implementing the project and any other bodies involved.
9. The methodology to be used to confirm energy savings (e.g. version for each EPC building before and after renovation/upgrade).
10. The verification mechanism that will be in place to confirm that each building has been completed, indicating also the organisation that will carry out the verification.
11. Any evidence that there is a commitment that the project will be implemented (e.g. political decision or funds have been secured).
12. Any other information available for the project (e.g. project information webpage).

Annex II.G: Questionnaire

As part of the public consultation of the Strategy, a questionnaire was carried out, which was answered by 14 members of the Advisory Committee on Promotion of Energy Saving in Buildings and Promotion of Zero Energy Buildings.

The Commission shall be composed of the following representatives of organisations and bodies directly involved in the buildings sector:

1. Energy Service of the Ministry of Energy, Commerce and Industry, as chairman.
2. Ministry of Interior.
3. Department of Town Planning and Housing of the Ministry of the Interior.
4. Department of Public Works of the Ministry of Transport, Communications and Works.
5. Department of Electrical and Mechanical Services of the Ministry of Transport, Communications and Works.
6. Department of Environment of the Ministry of Agriculture, Rural Development and Environment.
7. Department of Labour Inspection of the Ministry of Labour, Welfare and Social Insurance.
8. Union of Municipalities of Cyprus.
9. Scientific and Technical Chamber of Cyprus (ETEK).
10. Cyprus Standardisation Organisation.
11. Cyprus Energy Office.
12. Cyprus Consumer Association.
13. Pancyprian Union of Consumers and Quality of Life.
14. Federation of Employers and Industrialists (OEB).
15. Cyprus Chamber of Commerce and Industry (CCCCI).
16. Meeting of Rectors of Cypriot Universities.

The results of the questionnaire are presented below, in order of preference.

Question 4

Please rank the reasons for energy upgrading of existing buildings in descending order, placing first what you consider most important for owners and last one that you consider less or not important.

1	Cost efficiency/reduction of energy bills.
2	Improving the thermal comfort that we welcome with the thermal conditions of a space (air temperature, relative humidity, radiated heat).
3	Climate change.
4	The increase in the value of the building.
5	Legislative compliance.

Question 5

Rank the financial tools to increase energy renovations in descending order, putting first what you consider most effective and last what you consider less or not effective.

1	State sponsorship for energy renovations such as 'Save and Upgrade' and the Renewable Energy and Energy Fund Plans.
2	State sponsorship for the general upgrading of the building, such as improving its static adequacy or the living conditions of users, including energy upgrading.
3	Capital income tax deductions for investments in energy renovations/building upgrades.
4	Reduced loan rate for energy/building renovation investments.
5	Funded by specialised investment funds that understand the financial gain from energy savings.
6	Energy Performance Contracts – an agreement to improve energy efficiency (verified and monitored) and achieve energy savings and related economic benefits.
7	Allocation of an additional building rate to buildings renovated.

Question 6

Rank the measures to increase energy renovations in descending order, putting first what you consider most effective and last what you consider to be the least or not at all effective.

1	Financial tools such as those referred to in question 5.
2	An online platform for building renovations to make it easier for owners to access guidance, planning, financing and renovation implementation services.
3	Building Renovation Passport – a tool to plan staged energy renovations, based on the benefit of each renovation step while adapted to the priorities of the owner.
4	Monetary benefit for owners of buildings, from the sale on the open market of electricity from renewable energy sources produced in their buildings.
5	An obligation for existing buildings to comply with a minimum level of energy performance such as, for example, an obligation to be a minimum energy class in the Energy Performance Certificate.
6	Allocation of an additional building rate to buildings renovated.
7	Imposing a mandatory annual energy savings target on energy distributors.
8	Fiscal disincentives to build new buildings to focus on renovations.
9	Extension of the application of the greenhouse gas emissions trading system to buildings (ETS II).
10	Confining urban planning areas to focus on renovations.

Question 7

Please rank the barriers to energy upgrades of buildings in descending order, placing first what you consider most dissuasive and last what you consider the least or not dissuasive.

1	The inability to obtain funding.
2	It requires high upfront costs leading to increased repayment time.
3	Homeowners give priority over renovation to sectors they consider most important to improve their quality of life. Similarly, businesses seek to invest in sectors that they consider to be more profitable.
4	Lack of information on the benefits of the energy upgrading of the building.
5	It is a complex process.
6	The assessment of the value of the building is not positively affected by any energy upgrades made to it.
7	The lack of trained human resources in the construction sector.

Question 8

Please rank the building types in descending order, placing first what you consider that the energy upgrading of this type of building is more likely to be implemented if appropriate policies and measures are in place, and ultimately what is less likely to be implemented.

1	Public buildings.
2	Owner-occupied single-family dwellings.
3	Schools.
4	Hotels.
5	Privately-owned apartments.
6	Offices.
7	Rented single-family houses.
8	Sale shops.
9	Rented apartments.

Question 9

Please rank the measures to improve the energy performance of buildings rented in descending order, putting first what you consider most effective and last what you consider to be the least or not at all effective.

1	Financial or other incentives for renting highly energy efficient buildings.	
2	Setting a minimum energy class requirement in the Energy Performance Certificate for buildings rented.	
3	Voluntary agreements between owner and tenant to share the costs and benefits of an energy upgrade.	
4	Incentives for pooling renovations in rented buildings. By increasing the amount of products needed through a clustering of projects, we will result in lower costs of purchasing materials, systems and labour.	

Question 10

Classify the points in the lifecycle of a building that will trigger more energy upgrades in descending order, placing first what you consider most effective and last what you consider the least or not effective.

1	When a static upgrade is made.	
2	When there is an aesthetic upgrade or another type of renovation (e.g. kitchen, bathrooms, etc.).	
3	When a change of use and/or additions are made.	
4	When a “dangerous building” is repaired.	
5	When rented to a new tenant or when a rental contract is renewed.	
6	When transferred to a new owner.	

Question 11

Please rank the following ways to strengthen the Energy Performance Certificate of a building in the real estate market in descending order, placing first what you consider most effective and last what you consider to be the least or not at all effective.

1	Link to the purchase and sale document.
2	Its connection with the rental contract.
3	Mandatory supervision by the Specialised Expert during the construction or renovation of a building.
4	EPC issued after construction of the building.
5	Its connection with the provision of other services such as electricity or water supply to the building (for new buildings).
6	It is linked to debt obligations.
7	Reconfigure it to make it easier for building owners, potential buyers and tenants to understand.

Question 12

Please rank the following individual energy upgrading measures in descending order, placing first what you consider most important and last what you consider to be not important at all, taking into account the energy savings it will bring, cost-efficiency, ease of implementation and improved living conditions.

1	Roof thermal insulation.
2	Replace air-conditioning systems with new more efficient ones.
3	Thermal insulation of walls.
4	Thermal insulation of exposed floors.
5	Photovoltaic installation.
6	Replacement of lamps with new LED lamps.
7	Replace frames with new more efficient ones.
8	Replacement of a conventional boiler with a heat pump.
9	Replacement of electrical appliances (excluding air-conditioning and lamp systems) with new more efficient ones.
10	Installing a smart meter providing a clear picture of the building’s energy consumption to enable occupants to activate and reduce energy costs and waste.

Annex II.H: National and international conferences and roundtables attended by the Energy Agency

1. Participation in the Sustainable Energy Investment Forum on 31 October 2023 at the Hilton Hotel in Nicosia. It was organised by the European Commission in cooperation with the Ministry of Energy, Commerce and Industry and the Ministry of Finance, with the support of the Cyprus Association of Energy Saving Enterprises (PASEEXE), a member of the Federation of Employers and Industrialists (OEB). It aimed to foster dialogue between key stakeholders in the area of financing energy efficiency and energy saving projects.
2. Participation in the international conference on RenewableEnergy Sources -Energy Efficiency 2023. The conference took place on 12 and 13 October 2023 at the Hilton Hotel in Nicosia. It was co-organised by the Ministry of Commerce and Industry, the Cyprus Chamber of Commerce and Industry and the International Renewable Energy Agency (IRENA) and was under the auspices of the President of the Republic of Cyprus. It aimed to bring together key stakeholders on renewables and energy efficiency to discuss and share best practices, lessons learned and opportunities to accelerate the uptake of RES and energy efficiency in Cyprus and similar economies.
3. Workshop on "Promoting research and innovation in the fields of Green Buildings and Circular Economy in the Construction Sector". The workshop was carried out on 23 May 2023 under the Mediterranean Island Cleantech Innovation Ecosystem (MICIE) project, which aims to strengthen the contribution of research and innovation to the climate and energy targets of Cyprus and Malta.