GOVERNMENT OF SPAIN
MINISTRY OF ECOLOGICAL TRANSITION AND THE DEMOGRAPHIC CHALLENGE
Energy Saving and Diversification Institute (IDAE)

ANNEX II:

PART II, POINT 6: GENERAL OVERVIEW OF EXISTING POLICIES AND MEASURES.
PART IV, POINT 9: POTENTIAL NEW STRATEGIES AND POLICY MEASURES

In accordance with Commission Delegated Regulation (EU) 2019/826 of 4 March 2019 amending Annexes VIII and IX to Directive 2012/27/EU of the European Parliament and of the Council on the contents of comprehensive assessments of the potential for efficient heating and cooling

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INTRODUCTION

Following the amendment of Annex VIII to Directive 2012/27/EU by Commission Delegated Regulation 2019/826, the required format for **national comprehensive assessments of the potential for efficiency in heating and cooling** includes a 'Part II' the contents of which include:

- Point 6 – general overview of the existing policies and measures as described in the most recent report submitted in accordance with Articles 3, 20, 21 and 27(a) of Regulation (EU) 2018/1999.

Under the same Regulation (Part IV) we also need to include an overview of possible new strategies and policy measures. The information required by the Regulation is:

- Point 9 – overview of new legislative and non-legislative policy measures to realise the economic potential identified in accordance with the analysis of the economic potential for efficiency in heating and cooling.

Both of these points are covered here in Annex II, which gives an overview of policies and measures for different timescales.

1. POINT 6: GENERAL OVERVIEW OF EXISTING POLICIES AND MEASURES

1.1. Current energy and climate policies and measures relating to the five dimensions of the Energy Union

1.1.1. Decarbonising the economy

The decarbonisation policies and measures rolled out so far form part of the Spanish Climate Change and Clean Energy Strategy, which was adopted by the Spanish cabinet on 2 November 2007, with an implementation period up to 2020. This strategy later had to be expanded with the following new planning instruments when the new European framework setting the 2020 targets came into force:

- road map to 2020 for the sectors not covered by the emissions trading system[1,2];
- Information on land use, land-use change and forestry initiatives in Spain[3].
- Report on progress made in land use, land-use change and forestry initiatives in Spain[4].
- national climate change adaptation plan[5].
- third work programme under the national climate change adaptation plan[6].

For greenhouse gases in the **non-ETS sectors** (housing, transport, agriculture, waste, fluorinated gases and branches of industry not subject to emissions trading) this capacity was laid down in the corresponding roadmap to 2020, which was published in September 2014 and analyses future emission scenarios, comparing them with the targets set by the EU Effort-Sharing Decision (Decision 406/2009/EC) and more specifically the 10% reduction on 2005 emissions by 2020 targeted for the non-ETS sectors. The relevant analysis showed up the shortcomings preventing this commitment from being met, so the roadmap also contains proposals for additional policy options and measures that, if implemented with sufficient momentum, would allow Spain to meet its 2020 targets in a cost-efficient manner.

The policies and measures that have been adopted or implemented to date at national level with an impact on decarbonisation or reducing greenhouse gases encompass a range of sectors. Some Autonomous Community and local authorities have also established ambitious energy and climate plans and measures for

[1] https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/Hoja%20de%20Ruta%202020_tcm30-178253.pdf
[2] https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/HojaRuta2020_Fichas_tcm30-178314.pdf
[3] https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/acciones_lulucf_espana_def_tcm30-178767.pdf
[4] https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/informe_progreso_utucts_es_2017_tcm30-178397.pdf
[5] https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/pna_v3_tcm7-12445_tcm30-70393.pdf
[6] https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/3PT-PNACC-enero-2014_tcm30-70397.pdf

the areas within their remit.

One notable example is the implementation of **Climate Projects** within the non-ETS sectors. These projects are promoted through the **Carbon Fund for a Sustainable Economy** (FES-CO_2) and aim to map out the progressive transformation of Spain's production system to a low-carbon model. Other highlights include the **Environmental Stimulus Plans** ('PIMA' as per the Spanish acronym), which are measures to combat climate change at national level, and the introduction of a tax on fluorinated gases, which has enabled the rapid transformation of this sector, drastically reducing its emissions.

The **cooling equipment PIMA is a significant example of a PIMA Plan**, helping to reduce emissions while also making cooling more efficient. Its initiatives encourage commercial distribution businesses to adopt alternatives to the use of fluorinated gases with high greenhouse warming potential. Although the aim of this Plan is to comply with legislation on fluorinated gas emissions, replacing appliances run on fluorinated gases also brings improvements in equipment efficiency. The Plan has a total budget of EUR 1.5 million to fund the replacement of cooling systems in certain conditions in order to meet the requirements under EU legislation and targets relating to cost-efficiency in energy consumption[7].

Renewables

The **2011-2020 Renewable Energy Plan** sets targets in line with Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources. The Plan aims to ensure that **by 2020 renewable sources provide at least 20.8% of gross final energy consumption** (39% of total electricity consumption) and **11.3% of consumption in transport**, going beyond the mandatory minimum targets set for Spain in the Renewable Energy Directive.

Spanish legislation promoting renewable energy has undergone several changes over recent years. Urgent measures were adopted in 2013 to ensure the financial stability of the electricity system, seeking to curb the growing tariff deficit, and including a major reform of the electricity sector and a mandate to the government to adopt a new legal and financial framework for power plants that generate electricity using renewables, cogeneration or waste. This resulted in a reduction in the remuneration received by plants using those technologies, abruptly slowing down their development. However, the need to meet the aforementioned renewable energy target by 2020 led to their deployment being given a fresh impetus in the form of a specific remuneration scheme promoting generation using renewables, high-efficiency cogeneration and waste, based on a competitive bidding process (auctions).

Support for the use of renewables for heating, cooling and off-grid electricity generation mainly comes in the form of grants for installed capacity awarded by the Autonomous Community authorities. Financial support for renewable energy also comes through existing project financing programmes, mostly run by the **Energy Saving and Diversification Institute ('IDAE' as per its Spanish acronym), which is part of the Ministry of Ecological Transition and the Demographic Challenge**. These involve comprehensive measures aimed at promoting the use of renewable energy sources (solar, biomass and geothermal) in the housing and services sectors, as well as promoting energy savings and improving the energy efficiency of existing buildings.

The **financing facilities for energy service companies to install renewable thermal installations** in buildings

[7] Aid awards under this plan are regulated by Royal Decree 1114/2018 of 7 September 2018.

– specifically the SOLCASA, BIOMCASA, GEOTCASA and GIT (*Grandes Instalaciones Térmicas* or 'large-scale thermal installations') programmes – also played an important role while they were in force. These programmes ended in 2020, partly due to the implementation of building refurbishment programmes with measures including renovating thermal installations to run on renewables (the PAREER/PAREER CRECE/PAREER II programmes, which will be discussed later on), which offered better conditions, as did the market.

Cogeneration

Any discussion of heating and cooling must necessarily consider all the legislative measures to promote cogeneration and regulate its economic activity. The most notable examples are outlined below:

Firstly, for the sectors subject to emissions trading rules, the EU ETS scheme is governed in Spain by the **Greenhouse Gas Emissions Trading Scheme Act (Act 1/2005 of 9 March 2005)**[8] and various Royal Decrees implementing it. Plants with a rated thermal input of more than 20 MW fall within the scope of this legislation. This includes cogeneration plants linked to any type of activity, regardless of whether they generate electricity under the 'ordinary' or 'specific' remuneration scheme and no matter which sector their output serves.

The **Electricity Sector Act (Act 24/2013)** provides the possibility of establishing new specific remuneration schemes that promote generation from renewables, high-efficiency cogeneration and waste. This possibility can be exercised in exceptional circumstances in order to meet energy targets emanating from Directives or other EU legislation, or where introducing such schemes would reduce energy costs and reliance on imported energy. The specific remuneration scheme for cogeneration and renewables is detailed in Articles 13 (*Economic and financial sustainability of the electricity system*) and 14 (*Remuneration of activities*).

The implementation of this new framework began with the adoption of **Royal Decree 413/2014 of 6 June 2014 regulating the generation of electricity using renewable sources of energy, cogeneration and waste**. It lays down power plants' rights and obligations, how they participate in the electricity market, the relevant administrative, registration and other procedures, and the applicable remuneration schemes, which are also governed by Order IET/1045/2014 (Ministry of Industry, Energy and Tourism) of 16 June 2014 approving the parameters of the 'standard plant' used to calculate remuneration for certain plants that generate power using renewables, cogeneration and waste. Other 'standard plants' and their remuneration parameters have since been approved by way of various legislative texts.

Finally, **Royal Decree-Law 15/2018 on urgent energy transition and consumer protection measures** made an amendment to the Excise Duties Act (Act 38/1992 of 28 December 1992) whereby energy products to be used at power stations to generate electricity or at cogeneration plants for either power generation or combined heat and power generation are exempt from the Hydrocarbons Tax.

Another important feature of Royal Decree-Law 15/2018 is the **elimination of charges and tolls on the self-consumption of power generated using renewables or through cogeneration**. If power is transmitted to nearby facilities through the distribution system for self-consumption purposes, any amounts due for the use of the distribution system may be charged. Any surpluses of generation plants associated with self-

[8] Since amended by Act 9/2020 of 16 December 2020 amending the Greenhouse Gas Emissions Trading Scheme Act (Act 1/2005 of 9 March 2005) for a cost-efficient intensification of emissions reductions.

consumption are treated like the power produced by all other generation plants, and any energy deficits that self-consumers cover by purchasing power from the transmission or distribution system are treated in the same way as other consumers' purchases.

As an additional measure to support the recovery of this sector, Royal Decree-Law 15/2018 also temporarily eliminated the 7% tax on the value of power generation for the third quarter of 2018 and the first quarter of 2019 (Additional Provisions Six and Seven).

Finally, Royal Decree-Law 20/2018 of 7 December 2018 on urgent measures to boost economic competitiveness in Spanish industry and commerce added an additional two years onto the regulatory useful lives (the time for which 'specific remuneration' is applicable) of cogeneration plants running on renewables and natural gas that would otherwise have come to the end after 1 January 2018 (Transitional Provision Three).

1.1.2. Energy efficiency

Until 2020, energy efficiency policy was structured through the 2014-2020 National Energy Efficiency Action Plan and its successor, the **2017-2020 National Energy Efficiency Action Plan**, which was submitted to the EU authorities in April 2017. The 2017-2020 National Energy Efficiency Action Plan meets the requirement set out in Article 24(2) of the Energy Efficiency Directive (Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012), which requires all Member States to submit the first such plan by 30 April 2014 and then on a three-yearly basis.

The energy efficiency promotion measures currently in place comprise a range of initiatives in the form of legislation or financial support with the aim of a general or specific impact on each energy-consuming sector. The most important structural measure was the decision to set up the energy efficiency obligation scheme and the **National Energy Efficiency Fund** to finance national energy efficiency initiatives (as provided for by Royal Decree-Law 8/2014 of 4 July 2014 approving urgent measures for growth, competitiveness and efficiency, subsequently ratified by Act 18/2014).

The purpose of the National Energy Efficiency Fund, which is managed by the IDAE, is to finance measures – including economic, financial and technical measures, as well as assistance, training and information – to increase energy efficiency in the different energy-consuming sectors with a view to helping to reach the cumulative end-use energy savings target set by the national obligation scheme under Article 7 of the Energy Efficiency Directive.

As the amendment of the Energy Efficiency Directive (Directive 2012/27/EU) by Directive (EU) 2018/2002 meant that the validity of the energy efficiency obligation scheme was extended to a new obligation period running from 1 January 2021 to 31 December 2030, the validity of the national energy efficiency obligation scheme established in Article 69 of Act 18/2014 of 15 October 2014 also needed to be extended. This was achieved through Royal Decree-Law 23/2020 of 23 June 2020, adopting measures in the field of energy and other areas with a view to reactivating the economy.

Buildings and the urban environment

Legislation

The approach to energy efficiency in cities consists of two main focus areas: one is buildings and the other is mobility, comprising both passengers and goods transport. If we look specifically at the concept of efficient heating and cooling, initiatives to improve the energy efficiency of buildings are included in the **2020 revision of the Spanish Building Sector Long-Term Energy Renovation Strategy**[9], supported by several pieces of legislation:

- The first is Spain's **Technical Building Code**[10] and its 'Basic Energy Saving Document', which sets out the energy performance requirements that buildings have to meet and establishes the definition of a 'nearly zero-energy building'. On the subject of efficient heating and cooling, the Basic Energy Saving Document requires the use of efficient thermal installations that ensure comfort and sufficient air quality (which means that HVAC equipment must be highly efficient). This includes the use of renewables in new-builds and renovations of existing buildings (for domestic hot water production, for example), as well as in other circumstances.

- Another key text is the **Thermal Building Installations Regulation**[11], which sets the conditions to be met by equipment fitted for the purpose of meeting thermal comfort and hygiene requirements in the form of heating, air conditioning and domestic hot water, in order to ensure the rational use of energy. This Regulation obviously needs to be revised following the recent adoption of energy efficiency and renewable energy legislation at EU level and technological developments in various areas. This revision work is ongoing, and part of the process is the work performed by the Urban HVAC Systems subgroup, tasked with analysing issues of particular relevance to that sector that might be covered by the Regulation. This work presents a major opportunity for the transposition into national law of some of the rules on district heating and cooling laid down in Directive 2018/2001 of 11 December 2018 on the promotion of the use of energy from renewable sources and in Directive 2018/2002 of 11 December 2018 amending Directive 2012/27/EU on energy efficiency.

- Under the **Energy Certification Scheme for Buildings**[12], building purchasers or users must be provided with an energy performance certificate, which provides objective information on energy efficiency and renewable energy mainstreaming in a building and the best ways to renovate the building from an energy perspective. With these points of reference, a building's owners or tenants can then compare and assess the building's quality in terms of both energy efficiency and renewable energy. The use of a common logo throughout Spain – the 'energy performance label' – is laid down in the same legislation. A new Royal Decree approving the basic procedure for the energy

[9] Ensuring compliance with Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency (following on from the 2014 and 2017 versions of this Strategy).

[10] The Technical Building Code was originally published in its current format in 2006 (Royal Decree 314/2006). Its energy-related sections were revised in 2013 (Order FOM/1635/2013 of the Ministry of Transport and Infrastructure) and 2019 (Royal Decree 732/2019). It applies to the building envelope and to thermal, lighting and renewable (thermal for domestic hot water and photovoltaic) installations.

[11] Royal Decree 1027/2007 of 20 July 2007, revised by Royal Decree 238/2013 of 5 April 2013, amending certain articles and technical instructions from the Thermal Building Installations Regulation.

[12] Royal Decree 235/2013 of 5 April 2013, since amended by Royal Decree 564/2017 to exclude certain buildings, including those that are listed for reasons of architectural or historical value and places of worship.

performance certification of buildings is currently in the process of being adopted. Once approved, it will replace Royal Decree 235/2013 of 5 April 2013.

Energy products and labelling

Regulation (EU) 2017/1369 setting a **framework for energy labelling**, which has been directly applicable at national level since 1 August 2017, provides a more cohesive and simplified labelling framework aimed at improving products' energy-related and environmental features and promoting their use by consumers (including the use of more efficient heating and cooling appliances).

Support programmes

Notable on the subject of the building sector are the IDAE-run **support programmes for the energy renovation of existing buildings**. There have been three calls for applications for this support, known by the acronyms PAREER/PAREER-CRECE, PAREER-II and PREE.

The PREE programme was adopted on 4 August 2020 by the Spanish cabinet on a proposal from the Ministry of Ecological Transition and the Demographic Challenge, in the form of Royal Decree 737/2020 regulating **the support programme for energy renovation measures in existing buildings** and regulating the direct award of support under this programme to the Autonomous Community and Ceuta and Melilla city authorities. Unlike the two previous editions, this programme is managed by the Autonomous Community authorities and coordinated by the IDAE, with an initial budget of EUR 300 million. The programme's end beneficiaries can be individual property owners, private or public legal entities that own existing buildings used for any purpose, homeowners' associations or groups of homeowners' associations from residential buildings, groups of property owners without a formal commonhold property declaration that, as a group, meet the requirements laid down in Article 396 of the Civil Code, companies that operate, lease or hold concessions for buildings that can prove this status, energy service companies or providers, local authorities, entities from the institutional sector of the Spanish public authorities, renewable energy communities, local energy communities, and local or Autonomous Community authorities, which can act on behalf of homeowners' associations or other building owners. The eligible projects are improvements to the thermal envelope, the replacement of conventional energy sources with solar thermal power, the replacement of conventional energy sources with geothermal energy, the replacement of conventional energy sources with biomass in thermal installations, improvements to the energy efficiency of any generation subsystems not covered by the above categories (heat pumps for example), improvements to the energy efficiency of the distribution, regulation, control and output subsystems of thermal installations and improvements to lighting installations.

An additional contribution in this area comes from the **2018-2021 National Housing Plan**, which includes a sub-programme (No 5) promoting improvements in energy efficiency and sustainability in homes. Work on a building's thermal envelope, efficient heating and cooling installations, switching to renewable energy for domestic hot water, heating and air conditioning, installing heat recovery devices or linking homes up to existing district heating and cooling systems are among the activities eligible for funding under this programme for homes and residential buildings.

Another source of financing for urban energy efficiency and renewable energy projects is the **JESSICA-FIDAE Fund**, also managed by the IDAE. Its beneficiaries are energy service companies (ESCOs) as well as private companies and public bodies that commission projects carried out by ESCOs. Another way in which the

public authorities structure work on energy efficiency in cities is the implementation of integrated sustainable urban development strategies targeting functional urban areas and the support programme for local authorities to fund stand-out projects.

The **support programme for local authorities** to fund stand-out projects promoting the transition to a low-carbon economy has been set up to encourage projects carried out by municipal authorities (or groups of municipal authorities) from the same Autonomous Community or City. A support line financing unique projects promoting the transition to a low-carbon economy at local authority level was approved by Royal Decree 616/2017. The application period for this support, which is framed within the **2014-2020 ERDF Operational Programme for Sustainable Growth**, closed on 31 December 2020[13]. The eligible work includes energy efficiency improvements to buildings and infrastructure (including thermal installations in existing municipal buildings), switching to renewable energy for thermal uses or for heating and cooling applications, thermal fluid distribution networks, and cooling installations.

Similarly, **energy renovations to existing central authority buildings and infrastructure** are also covered by the extension of the validity period of Spain's 2014-2020 ERDF Multiregional Operational Programme. The comprehensive initiatives covered by this programme include the energy renovation of buildings, partial building renovations, and initiatives to improve the energy efficiency of non-building infrastructure.

Finally, measures to improve energy efficiency in cities also aim to promote high-efficiency cogeneration (in synergy with the decarbonisation dimension, mainly where renewable sources of energy are used) and district heating and cooling networks, as well as energy efficiency measures in transformation, transport, distribution and participation in demand, as part of this comprehensive energy efficiency strategy.

Industry

Energy efficiency measures targeting non-urban environments, i.e. sectors other than buildings or transport, also benefit from support measures tailored to the specific features of each sector. For example, priority has been given to providing financial support for investment within the framework of the public policy promoting industrial competitiveness.

- One specific example comes from the past and present **energy efficiency support programmes for SMEs and major companies in the industry sector**. With funding from the National Energy Efficiency Fund's budget, the aim of these programmes is to incentivise and promote action in the industrial sector to reduce carbon dioxide emissions by improving energy efficiency, with a view to reducing final energy consumption. Aid is granted for up to 30% of the eligible investment, and to be eligible for aid the measure must fall into at least one of the following categories:
    - Measure 1 – improving technological equipment and industrial processes;
    - Measure 2 – introducing management systems.

  The third call for applications for support under this programme, open until 30 June 2021, was allocated a budget of EUR 350 million. While the characteristics – i.e. the type of support, beneficiaries and initiatives – have remained the same throughout all three calls, for this third call the programme is directly administered by the Autonomous Community and City authorities, with the IDAE in a coordinating role.

[13] The latest extension to the budget, which also incorporated some amendments, was by Royal Decree 316/2019 amending Royal Decree 616/2017 of 16 June 2017, making a maximum of EUR 987 million available to local authorities to fund sustainable urban development measures in their municipalities.

These programmes therefore included initiatives targeting improvements in industrial heating and cooling processes, as well as management systems for these processes.

- The IDAE-managed **JESSICA-FIDAE Fund**, already mentioned earlier, has also funded energy efficiency and renewable energy projects in the industry sector. One example is the implementation of initiatives targeting more efficient heat recovery systems in industrial sub-sectors, among other work, within the 'priority thematic area' of *Energy efficiency, combined generation and energy management*.

- Another of the mechanisms that work together in synergy to promote efficiency in heating and cooling processes is the **energy audit**. Royal Decree 56/2016 of 12 February 2016[14] on energy audits sets up a regulatory framework that encourages organisations to take action to improve energy efficiency, save energy and reduce greenhouse gas emissions in order to help to meet EU targets. Major companies and other entities subject to this requirement have to undergo an energy audit covering at least 85% of their installations' final energy consumption at least every 4 years (having an independently certified energy or environmental management system in place is considered equivalent to this requirement provided that the established minimum criteria are met). These audits must be conducted by qualified energy auditors and verified by an independent inspection service reporting to the competent authority for energy efficiency. To this end, the Ministry of Ecological Transition and the Demographic Challenge has established an Energy Audit Administrative Register[15], which is publicly accessible free of charge.

- The support programme for **energy efficiency measures at desalination plants**[16], an IDAE-managed initiative under the National Energy Efficiency Fund, was established with the aim of cutting carbon dioxide emissions by introducing energy-saving and energy-efficiency projects at desalination plants, helping to meet final energy consumption reduction targets. This programme covered technological improvements in desalination equipment and processes and the introduction of energy management systems, and had an allocated budget of EUR 12 000 000, comprising two types of support: direct grants that do not have to be paid back and a financing facility.

- We should also mention the **Industry Financing Support Framework**, an 'umbrella' programme comprising many different financing facilities. While this Framework has many synergies with the fifth dimension of the Energy Union – *Research, innovation and competitiveness* – the features that are most closely aligned with the *Energy efficiency* dimension are outlined below:

  - The ***support programme for R&D&I projects in the manufacturing industry*** is aligned with the 'New Industrial Policy 2030' and the aims of transforming the industrial sector by making R&D&I a continuous process within businesses and innovating in order to progress towards the green

[14] Transposing Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency.
[15] https://sede.serviciosmin.gob.es/es-es/procedimientoselectronicos/Paginas/detalle-procedimientos.aspx?IdProcedimiento=146#clave
[16] Although this funding programme was open for applications from 2015 until 2018, we have included it here because some of the effects of the projects financed (including those carried out from 2018 onwards) have materialised since then.

transition. Regulated by Order ICT/859/2019 (Ministry of Industry, Trade and Tourism) of 1 August 2019, the programme supports industrial research, experimental development or organisational or process-related innovation, structured into a number of thematic priorities, including the circular economy and eco-innovation with a view to improving value chains and decarbonisation, energy efficiency and new sustainable sources of energy in industry. For energy efficiency and decarbonisation projects to benefit from funding, their aims must include introducing and using more efficient production technologies and processes, raw materials with a lower environmental impact, decarbonisation technologies such as the use of new sustainable or low-carbon energy sources or energy storage technologies, including hydrogen and fuel cells.

- The **reindustrialisation and industrial competitiveness programme** aims to encourage businesses to invest in new, more advanced, more efficient and environmentally friendly production models and in the manufacturing of products and provision of services with higher added value, as well as measures helping them to access – and improve their presence on – international markets. To this end, the programme has supported investments aimed at improving operational industrial plants by making changes and alterations with a major impact on their competitiveness.

- The 'project financing and services contract' is an arrangement in which the IDAE provides advice and coordination services at all stages of the implementation and operation of an investment project, as well as financing it. The IDAE is repaid on the basis of the energy savings achieved at the installation, allowing the project developer to modulate the project financing costs.

- A final point worth mentioning is the support provided in the industry sector over recent years via the **third-party financing mechanism**. Third-party financing is a technical and financial instrument whereby the IDAE is the 'third party', providing financial and technical assistance for the installation of energy efficiency equipment and recovering its expenditure over a period of time through the energy savings achieved. Under this scheme, the IDAE makes the investment directly and owns the equipment. Once it has recouped its investment the plant becomes the owner of the equipment. This mechanism has been used mainly for energy-saving and energy-switching projects in the manufacturing industry and for solar, small hydro and low-temperature energy projects in the services sector.

We can sum up by concluding that energy efficiency has improved thanks to the implementation of measures – many of them with a direct or indirect contribution to making heating and cooling more efficient – under the 2017-2020 National Energy Efficiency Action Plan and previous plans.

1.1.3. Synergies between efficient and/or renewable heating and cooling measures and the other dimensions of the Energy Union

The measures that promote efficient or renewables-based heating and cooling fall, for the most part, within the *Decarbonisation (reduction of emissions and renewables)* and *Energy efficiency* dimensions. However, there are also fundamental synergies between these measures and the other dimensions of the Energy Union, which are discussed below.

Energy security

As we have already pointed out, Spain's reliance on imported energy is very high, standing at 75% in 2019. This is because fossil fuels – which, with domestic production virtually non-existent, have to be imported in their entirety – dominate the national energy mix. Hydrocarbon imports are therefore a crucial element of energy security, understood in terms of security of supply.

Natural gas plays a smaller role in the Spanish energy mix than in other EU Member States for the following reasons:

- Spain has a milder climate, resulting in lower penetration of natural gas among domestic consumers and for central heating purposes;
- Natural gas is more important as a power generation source, so its share of final energy is considerably smaller than its share of primary energy.

The proportion of petroleum products in the national energy mix is well above the EU average, mainly because road, sea and air transport (in this last case due to the importance of the tourism industry) are highly developed in Spain.

Although domestic hydrocarbon production is virtually non-existent, Spain is one of Europe's leading countries in terms of its diversification of oil and gas suppliers.

The measures detailed above to promote efficient cogeneration, district heating and efficiency initiatives, particularly in thermal installations, go a long way towards helping to decrease fuel consumption, reducing reliance on imported energy.

The internal energy market: interconnectivity, infrastructure and market

The existing hydrocarbon transmission network, natural gas transmission infrastructure planning and the reinforcement of the electricity transmission network are yet more aspects with an impact on the heating and cooling sector.

On the subject of hydrocarbon transmission, as there was no specific regulation governing the planning of the core natural gas network, until 2018 it was subject to joint planning with the electricity grid. Since then, following the reasoning established by the National High Court in its judgments of 31 October 2012, the binding features of these two planning processes have been managed separately.

Any future natural gas transmission infrastructure planning will take place once implementing legislation, including the relevant planning procedure, has been adopted for the hydrocarbon sector. Until then, the basic rules can be found in the Hydrocarbons Act (Act 34/1998 of 7 October 1998) and in Articles 79 and 80 of the Sustainable Economy Act (Act 2/2011 of 4 March 2011). The reference document for this area is the 2008-2016 Electricity and Gas Sector Planning Paper, approved by the Spanish cabinet on 30 May 2008.

Based on a sector analysis and demand forecasts, this Planning Paper sets out the criteria for developing the core natural gas network, entry points and technical specifications for pipeline and storage capacity design. It assesses and identifies the need for new transmission capacity and storage and regasification infrastructure, providing a basic outline of a secure and flexible system that links up all the gas network

zones.

Similarly, the effective development and management of the electricity transmission network will play a key role in a future scenario where there is already a shift toward electricity to meet certain thermal demands (one example being the use of heat pumps in sectors such as housing). The first steps that have been taken towards reforming the energy markets, giving suitable price signals to end consumers, and removing the barriers to the development of self-consumption (Royal Decree 244/2019 of 5 April 2019) or consumers' access to data for more efficient management and decision-making, are an important part of this transition towards an increased role of electricity in meeting heating and cooling demand.

Research, innovation and competitiveness

In terms of an overall framework in which the initiatives promote and benefit – albeit tangentially and indirectly – technological processes bringing innovative and/or competitive heating and cooling systems, we have **Spain's 2013-2020 Science, Technology and Innovation Strategy and the National Scientific and Technical Research and Innovation Plans**.

Spain's 2013-2020 Science, Technology and Innovation Strategy is the instrument that establishes the general aims for the 2013-2020 period linked to the promotion and development of research, innovation and competitiveness activities in Spain. These aims are aligned with those set by the European Union in the '**Horizon 2020'** framework programme funding research, innovation and competitiveness activities for the 2014-2020 period. The Science, Technology and Innovation Strategy sets out the priorities covering the entire process of developing and implementing scientific and technological research, 'from idea to market'. Its objectives include environmental sustainability, climate change resilience and energy supply, as central themes to be tackled.

The 2013-2020 Science, Technology and Innovation Strategy is complemented by sector-specific policies, including coordination with the Spanish Climate Change and Clean Energy Strategy, which establishes the aim of meeting Spain's commitments relating to climate change and promoting clean energy, while at the same time improving social welfare, economic growth and environmental protection.

Spain is, moreover, undergoing an energy transformation that, while remaining affordable, makes it possible to meet EU targets for reducing greenhouse gas emissions and decarbonising the economy. The **Strategic Energy Technology (SET) Plan** plays a major role throughout this process. The Communication from the Commission ***Towards an Integrated Strategic Energy Technology (SET) Plan: Accelerating the European Energy System Transformation*** of September 2015 proposed ten key actions in line with the priorities of the Energy Union and its fifth pillar – research, innovation and competitiveness. The proposal aimed for a definitive shift in the concept of the European energy system, proposing an integrated system that would break down the silos that had until then existed in energy technology.

Finally we should mention the units responsible for financing the activities proposed by the Ministry of Science and Innovation, using the instruments set up in implementation of Spain's Science, Technology and Innovation Strategy and the national R&D&I Plans, namely the National Research Agency, the Centre for the Development of Industrial Technology, the Spanish National Research Council and the Energy and Technology Research Centre, as well as the various Technology Platforms, whose programmes and work plans contribute to a paradigm shift in technological and energy terms across our entire society, addressing

one of the biggest challenges facing us today.

2. POINT 9: OVERVIEW OF NEW LEGISLATIVE AND NON-LEGISLATIVE POLICY MEASURES

Work aimed at transforming the production model, boosting decarbonisation, promoting energy efficiency, renewable energy deployment and integration, electrifying the economy, and developing energy storage and the circular economy will be channelled through the Government's Energy and Climate Framework, which comprises the Climate Change and Energy Transition Act, the National Energy and Climate Plan, the Just Transition Strategy, the Fuel Poverty Strategy, the National Climate Change Adaptation Plan and the Long-Term Strategy for a Modern, Competitive and Climate-Neutral Economy by 2050.

The various sectors of the economy and the housing sector need to be 'decarbonised', and the keys to this process are the proactive involvement of members of the public, improving the diversity of actors by promoting participatory projects in both renewable energy generation and the energy system as a whole, stimulating energy storage and reviving the country's economic activity.

Thanks to this assessment of the technical and economic potential for renewable and/or efficient heating and cooling we have identified tangible and achievable potential offered by the various heating and cooling technologies studied, which could help transform the final energy supply, increase the use of renewables and improve efficiency in the provision of heating and cooling in the main energy-consuming sectors.

Capitalising on the potential we have identified and putting it into action is both likely and achievable thanks to a policy framework that facilitates this in the short-to-medium term, with a number of initiatives and measures, several of them focusing on promoting renewables and efficient heating and cooling.

All of this is, first and foremost, specifically included in the objectives of the ***2021-2030 Integrated National Energy and Climate Plan (NECP)*** (sent to the European Commission in March 2020). The NECP provides the overall framework steering the programme of investments and reforms for a just environmental transition that develops the strategic capabilities of the green economy. Turning to the share of renewables in gross final energy consumption targeted by the EU for 2030 (32% for the EU as a whole), the NECP plans out significant growth in the penetration of renewables in Spain, increasing to 74% in electricity generation and 42% in final energy consumption by 2030. Thermal uses accounted for around 33% of total final energy consumption in Spain in 2019. In that same year, the contribution of renewables to energy consumption for heating and cooling purposes stood at around 18.9%. To improve these figures, measure 1.6 of the NECP (*Renewable thermal energy development framework*) provides for the introduction of incentives and support programmes for this type of renewable energy. In order to achieve the 2030 targets, the renewables share will have to be doubled, so these and other support schemes to be offered in the area of renewable thermal energy are key to progress in this direction. Moreover, in the short term, promoting these systems will cut consumers' home energy costs, making a significant contribution to combating fuel poverty and improving people's personal finances.

In the current circumstances of economic recovery following the COVID pandemic, this framework has been reinforced by Spain's ***Recovery, Transformation and Resilience Plan***, implementing the 'Next Generation EU' recovery plan for Europe. It will allow Spain to draw up a roadmap towards a modernisation of its economy, requiring the involvement of all economic and social stakeholders. This plan will allow structural reforms to take place in the coming years through legislative changes and investments, and will therefore transform the production model so that the economy can recover from the COVID-19 pandemic.

The Recovery, Transformation and Resilience Plan is in line with the NECP's objectives and will help speed up the achievement of these objectives by making investments earlier than originally planned and bringing the initiatives with the highest leverage effect, originally planned for 2025, forward to 2023. Decarbonisation will primarily be achieved by improving energy efficiency and air quality in cities, promoting and using alternative sources of energy and energy storage, as well as by diversifying the sources used to generate energy.

One of the Plan's aims is for Spain to commit to decarbonisation, and the ecological transition is one of its four cross-cutting themes. The ten policy levers established in the Recovery, Transformation and Resilience Plan include a number of components that build on and bring forward the implementation of measures under the NECP, affecting, to varying degrees, the efficient and/or renewable heating and cooling sector. These components, which are detailed below, cover lines with a major direct impact, such as the **deployment and integration of renewables, and smart infrastructures and grids with the deployment of flexibility and storage**. Other components include objectives that affect heating and cooling in synergy, such as the housing and public authority building renovation plan. The **incentive programmes** to be approved in the near future provide for the implementation of initiatives structured around these components.

The measures and investments affecting efficient and/or renewable heating and cooling provided for in the Recovery Plan are fully in line with those set out in the NECP, one notable example being component No 2, the **Housing Renovation and Urban Regeneration Plan**. It seeks to achieve energy renovation rates that are significantly above current figures, which would allow the renovation targets set out in the NECP and Spanish Building Sector Long-Term Energy Renovation Strategy to be met ahead of schedule. The Housing Renovation and Urban Regeneration Plan includes two investment lines with an impact on investments in efficient and/or renewable heating and cooling installations, among other objectives:

- the *energy renovation programme for buildings* (PREE), which encourages the energy renovation of existing homes and buildings used for other purposes, through energy-saving and energy-efficiency measures and also with the introduction of renewables;
- the *regeneration and demographic challenge programme*, for public and private projects to improve the energy efficiency of buildings, the generation and consumption of renewables and the deployment of electric mobility in towns and villages with fewer than 5 000 inhabitants.

Another key component of the Recovery Plan is component No 7, with the **deployment and integration of renewable energies** aimed at developing an integrated energy system in sectors, territories and infrastructure, in terms of both the electricity sector and end use. In order to develop **innovative renewable technologies that are integrated into buildings and production processes**, we need to see renewable energies introduced in strategic sectors of industry and self-consumption equipment put in place, helping families, businesses and communities to generate their own renewable energy and cut their energy bills.

To this end, a number of legislative reforms are planned. These include establishing a regulatory framework that promotes renewable generation, creating certainty and encouraging investment, a National Self-Consumption Strategy to encourage self-consumption, the development of energy communities to increase public participation in the energy transition, and a Renewable Energy Innovation and Technological Development Framework, since some renewable sources require the establishment of a strategic framework to assist their deployment (some examples are offshore wind power, biogas and R&D testbeds).

Notable examples of **investment schemes** are the various lines of support for initiatives such as converting buildings, companies and industrial plants to integrated renewables, projects to integrate renewables into a local area, introducing renewables into industrial processes or developing innovative renewables technology, and direct public investment in pilot projects or innovative schemes. Last but not least, we should mention

the support for projects aimed at increasing the penetration and integration of renewables in Spain's island and non-mainland systems.

Another key measure involves the implementation of component No 8, which includes a set of key measures for **electricity infrastructure, the promotion of smart grids, and the deployment of flexibility and storage**. To support the integration of renewables through a modern network that is ready for the 21st century, Spain intends to invest more than a billion euro in digitalising its distribution, storage and flexibility networks to meet the requirements for an energy transition.

The planned reforms notably include a framework making it possible for renewables to be integrated into the energy system (grids, storage and infrastructure), an energy storage strategy, the development of a regulatory framework for aggregation, demand management and flexibility services, and the creation of sandboxes or regulatory testbeds so that these changes can be implemented in a controlled manner.

As part of the investments under component No 8 we have support for the deployment of large-scale energy storage, investment in the digitalisation of distribution networks to meet the requirements for energy transition, and investments in new business models including those relating to demand management, aggregators, flexibility services, data access and 'sandboxes'.

Although they are initially geared towards electricity, the development of new concepts and participants such as energy communities that boost self-consumption, storage and demand aggregators will pave the way for thermal schemes designed for a more efficient and integrated system.

One of the key instruments in realising the potential for heating and cooling, and one that falls under both components (7 and 8) is the upcoming support programme for incentive programmes linked to self-consumption and storage, using renewable energy sources, and the **introduction of renewable thermal systems in the housing sector** as part of the Recovery, Transformation and Resilience Plan. This last planned financing facility, which is key to achieving the penetration of renewables in the end use of energy, will encourage investments in thermal energy production facilities based on solar thermal, biomass, geothermal and aerothermal technologies, among others, for heating, air conditioning and domestic hot water in homes.

Other planned policies that we should mention in view of their sector-specific approaches, and which will contribute to achieving heating and cooling targets, are the public authority modernisation initiatives (component No 11) involving a renovation of public authority buildings and the use of renewables, and investments as part of the programme to boost industrial competitiveness and sustainability (component No 12) which include strategic projects linked to renewable energy.

To sum up, the Plan consists of a set of main policy lines that are expected to have a direct or indirect impact on the heating and cooling sector, increasing its efficiency and/or the use of renewables. We can therefore conclude that a structure is in place that enables measures and actions to be carried out in the short-to-medium term with a view to capitalising on and implementing the potential identified in this heating and cooling evaluation exercise. Finally, this policy framework is one of the essential elements for territorial development and social and territorial cohesion, as well as for increasing productivity, improving competitiveness, and increasing employment and the Spanish economy's export capacity.