advancing with ESIF financial instruments

The potential for investment in energy efficiency through financial instruments in the European Union

Spain in-depth analysis

May 2020

European Commission

European Investment Bank The EU bank

Disclaimer

Objective of the document

The objective of this report is to give an overview of the state and progress of energy efficiency developments in Spain, and a preliminary assessment of investment needs and potential use of ESIF financial instruments to cover them. This report would serve as an input to the negotiations of operational programmes for the period 2021-2027.

This document is based on data and information released prior to the outbreak of the Coronavirus (COVID-19-19) pandemic. Although it is still not possible to properly estimate the impact of COVID-19, a severe economic recession is currently (May 2020) forecasted for year 2020 in the European Union (EU).

The recession may have deep repercussions in the years to come in the economic and financial systems of EU Member States (MS), therefore economic and financial context reported in the document may sharply deteriorate in the near future. Cohesion Policy resources, and public resources in general, are expected to play a crucial role to support the economic recovery in the next programming period.

Energy efficiency (EE) investments can play an important role to support the economic recovery, as (i) they have a considerable job creation effect; (ii) they contribute to reduce energy costs and greenhouse gas emissions; and (iii) they increase MS energy security.

There is a risk that, at least in the short run, the crisis will lead to lower energy costs due to a lower demand, thus can create lower incentives for EE investments. An appropriate use of financial instruments to support EE investments enables the use of Cohesion Policy resources in a revolving way and to generate leverage by crowding-in private co-financing in order to meet significant investment needs.

Information reported in the following sections is based on publicly available sources, in particular:

- Eurostat national statistics
- Odyssee database
- Draft version of the National Energy and Climate Plan (NECP) of Spain
- Final version of the National Energy and Climate Plan (NECP) of Spain
- EC assessment of the draft National Energy and Climate Plan of Spain
- Long-term strategy for energy renovation in the building sector in Spain pursuant to article 4 of directive 2012/27/UE (2014)
- Update of the long-term strategy for energy renovation in the building sector in Spain (2017)
- Assessing the potential use of financial instruments in Low carbon economy in Spain. A study in support of the ex-ante assessment. European Investment Bank. PwC. Final Report (October 2017)
- EU Energy Poverty Observatory Member State Report Hungary;
- JRC Science for Policy Report, Accelerating energy renovation investments in buildings 2019;
- JRC Science for Policy Report, Synthesis report on the assessment of member states' building renovation strategies, 2016;
- JRC Science for Policy Report, Energy Service Companies in the EU 2017;
- Allocation of Cohesion policy funding to Member States for 2021-2027. European Court of Auditors. March 2019;

Interviews were conducted with: the Spanish Institute for Diversification and Energy Efficiency (Instituto para la Diversificación y Ahorro de la Energía), the national Association of Facility Managers and Energy Service Companies (Asociacion de Empresas de Mantenimiento Integral y Servicios Energeticos); and the Spanish Ministry of Finance, Directorate General of EU Funds (Dirección General de Fondos Europeos, Secretaría de Estado de Presupuestos y Gastos, Ministerio de Hacienda).

1. Context overview

Spain has about **46.9mln inhabitants** as of January 2019 (10.5% of the EU27) slightly increasing over time (2.17% over the 2008 – 2018 period)[1] and over the next decade, the Spanish population is expected to experience 1% growth[2]. **Gross domestic product** (GDP) **per capita** in 2018 was about **EUR 24 880** (10% lower than the EU27 average) and has increased by 2.88% in the last 10 years[3].

Impact of the COVID-19 crisis

Based on the European Commission 'Spring 2020 Economic Forecast', released in May 2020, due to the COVID-19 outbreak, Spain will suffer a sharp recession in 2020 with the gross domestic product **(GDP) expected to contract by about 9.4% in 2020, before partially recovering by 7% in 2021.**

The **unemployment rate** is expected to increase from 14.1% (2019) to 18.9% (2020) and it is expected to remain at a high level also in 2021 (17.0%).

To support the national economy, a strong public fiscal stimulus will be deployed, with the **Government deficit** expected to reach 10.1% of GDP in 2020 and to remain high also in 2021 (6.7%).

Due to the combined impact of the decrease of the GDP and the increase in the government deficit, the **debt/GDP ratio is expected to reach 115.6% in 2020** (it was 95.5% in 2019) and it is expected to remain high also in 2021 (113.7%).

Based on the EC Spring 2020 economic forecast: '*the strict confinement measures put in place in Spain in response to the outbreak of the COVID-19 pandemic are expected to result in an unprecedented contraction in economic activity. Output should rebound strongly once restrictions are lifted, but the recovery will be uneven across sectors, and the lost output will not be fully recovered within the forecast horizon'.*

The crisis could have a dual negative impact on EE investments, by both **reducing the demand** (e.g. households and enterprises may decide/be forced to postpone investments) **and the financial supply** (e.g. financial intermediaries may become more selective in their lending activity) **therefore increasing the importance of EE related supporting schemes.**

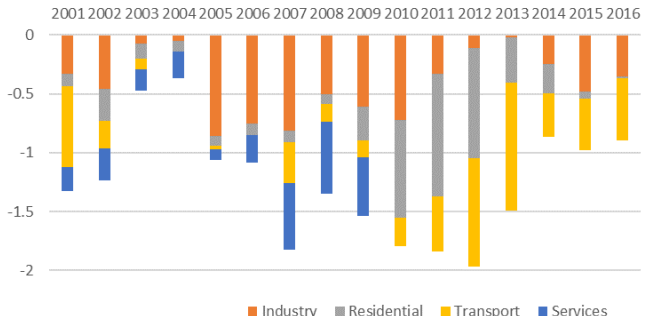
Final energy consumption (FEC) in 2018 was 86.8Mtoe (8.8% of the EU27) and it has **decreased by 11.5% since 2005,** while at the EU27 level it decreased by 4.9%[4].

Consumption per capita (1.86toe/person) in 2018 was 16% lower than the EU27 average (2.2 toe/person) and it has decreased by 10% in the last 10 years (while at the EU27 level it decreased by 6%)[5].

Energy productivity (GDP over the gross available energy) in 2018 was 8.4 Euro per Kg of oil equivalent (4% higher to the EU27 average), showing a moderate reliance on energy to generate GDP (this index increased by 7% in the last 5 years)[6].

Sectors contributing to FEC are: transport (38% of the total), industry (22.5%), households (18%) and services (12%)[7].

Annual technical energy savings by sector (Mtoe)



Regarding energy efficiency (EE): **during the** 2001 - 2016 **period, Spain reported about** 20.1Mtoe of cumulative (technical) final energy savings[8] **mainly related to industry (33%); transport (29%) and the residential sector (24%).**

Overview of the residential sector

The **stock of dwellings**[9] in Spain is estimated (as of 2018) in circa **25.7m**, of which 19m are main dwellings.

During the 2001 – 2018 period the stock of dwellings increased by 22% however the increase was mainly recorder in the beginning of 2000s, while the increase in the last 10 years (2009 – 2018) was just 3%.

More than 50% of dwellings are concentrated in four regions: Andalusia, Catalonia, Valencia and Madrid

Stock of dwellings per region over time[10]

Number of dwellings	2001		2009		2018		Δ 2001-2018	Δ 2009-2018
National stock	**21 033 759**	**100%**	**24 908 126**	**100%**	**25 712 744**	**100%**	22%	3%
Andalucía	3 554 198	17%	4 299 768	17%	4 432 048	17%	25%	3%
Cataluña	3 328 120	16%	3 835 854	15%	3 924 907	15%	18%	2%
Valencia	2 558 691	12%	3 125 409	13%	3 188 841	12%	25%	2%
Madrid	2 482 885	12%	2 867 105	12%	2 989 422	12%	20%	4%
Castilla y León	1 455 050	7%	1 696 219	7%	1 749 430	7%	20%	3%
Galicia	1 312 496	6%	1 575 449	6%	1 626 000	6%	24%	3%
Castilla-La Mancha	988 555	5%	1 219 348	5%	1 272 514	5%	29%	4%
País Vasco	892 009	4%	994 459	4%	1 056 514	4%	18%	6%
Canarias	855 022	4%	1 030 507	4%	1 053 241	4%	23%	2%
Aragón	657 555	3%	765 180	3%	798 945	3%	22%	4%
Murcia	595 319	3%	769 138	3%	787 604	3%	32%	2%
Extremadura	575 284	3%	640 603	3%	663 844	3%	15%	4%
Other Regions	1 778 575	8%	2 089 087	8%	2 169 434	8%	22%	4%

Based on data of the 2014 Spanish long-term strategy for energy renovation in the building sector, circa **69% of dwellings are in multi-family buildings** and 31% are single-family.

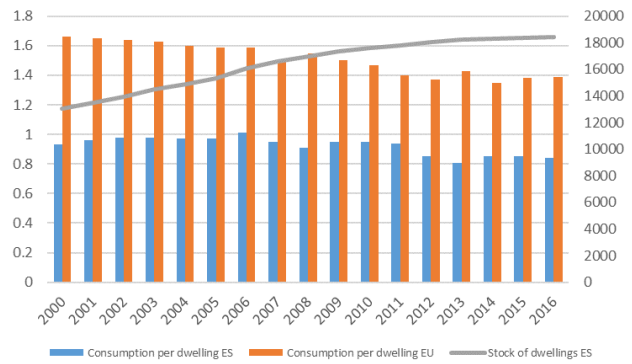
With respect to the **ownership**, according to the data from the 2011 census, among main dwellings, **over three-quarters (79%) are owned**, while just 13% are rented and 8% are made available free of charge or in another way.

Energy **consumption in the residential (households) sector**:

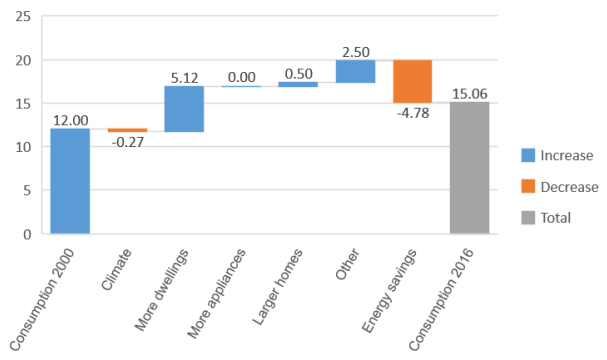
- In 2018, households' energy consumption was 15.0Mtoe (6.1% of EU27)
- **Consumption per dwelling is 0.84toe** (**40% lower than EU average**)[11] and decreasing by 12% over the last 10 years;
- Consumption is driven by space heating (44% of total) and electrical appliances and lighting (30%)[12].

During 2000 – 2016, despite the increase of the stock of (permanently occupied) dwellings (about 5,4m more dwellings or +11%) consumption in the residential sector increased by only 3.6Mtoe. This small increase was due to saving initiatives worth 4.8Mtoe.

Dwellings (thousand) and consumption (toe/dw)[13]



Households consumption between 2000 and 2016 (Mtoe)[14]



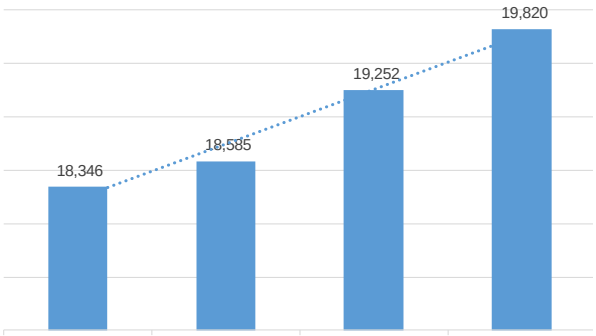
In terms of EE, during the **2014 – 2016** period, it is estimated that almost **120,000 residential buildings were renovated**, for an overall investment estimated at circa EUR 4.8bn.

Expected dynamics in residential buildings

In the **coming years**, the activity in the construction sector is expected to be heavily influenced by the obligation (starting from 2021) that **all newly constructed buildings will be nearly-zero energy** (nZEB).

Based on the NECP, during the **2020 – 2030** period dwellings are expected to have a relevant increase (**+6% or +1.2m units**), as reported in the figure, passing from 18,585 (2020) to 19,820 in 2030.

Projections of the number of dwellings



More information about the expected trends of the building sector will be reported in the 'Long term strategy for energy renovation in the building sector' to be produced in 2020.

The COVID-19 related economic crisis could have significant negative impacts on the building sector, thus slowing down the building construction/renovation activity, at least in year 2020. Detailed information in this respect are currently not available.

ENERGY POVERTY[15]

Circa 8% of households in Spain are reported not be able to keep their homes adequately warm (slightly more than the EU average).

Almost all indicators typically used to study the energy poverty phenomenon are in line with (or lower than) the EU average, with the exception of arrears on utility bills and the inability to keep home adequately warm.

Energy poverty in Spain seems to be a **larger problem for households that rent as opposed to own their housing**. This is true both on the private market and in social housing. In addition, households living in apartments seems to be more vulnerable to energy poverty.

There are several measures, at the national and local level to address the energy poverty issue. Among these it can be reported the **national social tariff for electricity**, which implements a discount on the electricity bill for vulnerable households and protects severely vulnerable households from disconnection.

In 2019, the **Spanish strategy for energy poverty** was approved, foreseeing several measures, including support to the most vulnerable households related to EE measures and the installation of energy production systems (RES) for self-consumption. In the following table the targets are reported[16].

Indicator	2017 data	2025 minimum target	2025 target
High share of energy expenditure in income	17.3	12.9	8.6
Low share of energy expenditure in income	11.5	8.6	5.7
Inability to keep home adequately warm	8%	6	4
Arrears on utility bills	7.4	5.5	3.7

The current COVID-19 related economic crisis can have a severe impact on Spanish households, potentially leading (at least in the short run) to an increase of households living in in energy poverty conditions.

1.1 Overview of the public sector

EE potential investments in the public sector (based on the ex-ante assessment)

Based on the ex-ante assessment performed during 2017, an analysis of several type of infrastructures related to the public sector and/or providing public services was performed.

Spain has a very high number of public sector buildings and infrastructure (e.g. 5,482 elderly houses and 1,129 halls of residences; 47,582 cultural buildings; 787 hospitals [321 public and 466 private]; 8.8m public lights; etc.).

The ex-ante assessment estimated that there could be a potential need for EE investments in public sector buildings and infrastructure worth circa EUR 2bn per year: EUR 760m for public lighting; EUR 433m for public infrastructure; EUR 391m for elderly houses and halls of residences; EUR 442m for social buildings and EUR 47m for hospitals.

The EC Energy Efficiency Directive (Art.5) prescribes Member States to perform (every year) EE renovations of 3% of the total building floor area of the buildings with a total useful floor area over 250sqm owned and occupied by the central government.

These type of buildings in Spain, as of 2019, have a total surface of circa **11,2m sqm.**

As of January 2018, **buildings of the central government** that did not meet the energy performance requirements – and therefore are **in need of EE renovations** - accounted for **9,3m sqm**.

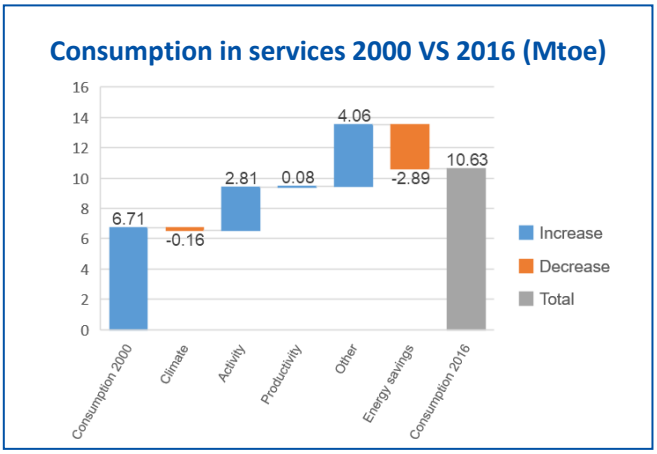
During the **2014 – 2018 period 1.45m sqm of building floor area** (of central buildings with a floor are larger than 250sqm) were **renovated** thus fulfilling the target for Spain.

1.2 Overview of services and industry sectors

The **services sector** accounts for 74% of the national GDP (in 2017)[17] while its energy consumption in 2017 was 10.4Mtoe, increasing over time (9% last 5 years VS +2.3% in EU28).

In the 2000 – 2016 period consumption in the sector increased sharply (60%) but it should also be highlighted that important energy savings where achieved, worth circa 2.9Mtoe (or circa 43% of 2000s consumption)[1] as presented in the figure.

In the ex-ante assessment performed during 2017, an analysis of several type of infrastructure/ buildings related to the **services sector** was performed.



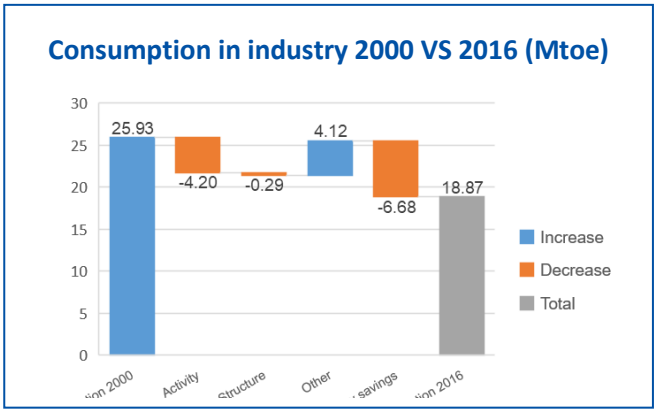
The analysis found a very high number of service sector buildings/infrastructure (e.g. 12,449 hotel establishments; 283,252 office buildings (111.3m sqm); 544 shopping centres (12.8m sqm); etc.) and it estimated a potential for EE investments in the sector of circa EUR 1.9bn.

The **industrial sector** accounts for 23% of the national GDP (in 2017) [18] and in 2017, industry consumed 18.9Mtoe (7.3% of EU28) with a decrease by 24% in the last 10 years[19].

During 2000-2016, energy savings achieved in industry were worth 6.7Mtoe or 40% of 2000 consumption[20].

Savings seem to be distributed evenly over the observed period (i.e. 50% of 2000 - 2016 energy savings were made before 2008 and the rest during 2008 - 2016).

In the ex-ante assessment performed during 2017, an analysis of the industry sector was undertaken. A very brief summary of the key findings is here reported:



- 198 000 enterprises in the sector (as of 2015) 55% of them in Catalonia, Andalusia, Valencia and Madrid;
- 99.4% of enterprises in industry are SMEs;
- Potential EE demand of EUR 128m per year.

2. EE targets, measures in place and proposed

Spain has a number of policy measures for residential and services as well as industry sectors. EE measures include a range of legislative and/or economic support actions, aimed at producing a general or specific impact on each consumer sector.

One of the most important structural decisions - following the obligation connected with the EE directive - was the establishment of the system of **energy efficiency obligations**, together with the creation of the **National Energy Efficiency Fund** (*Fondo Nacional de Eficiencia Energética* - FNEE), managed by the national Institute for Diversification and Energy Efficiency (IDAE), in order to finance national EE initiatives. ESIF also play a key role to support EE policies, in particular via the Spanish Multiregional Operational Programme (POPE).

NEW PLANNED POLICIES (2020-2030)

Spain's **2050 objective is to achieve climate neutrality**, with the reduction of GHG emissions by at least 90%, as well as achieving a **100% renewable electricity system**. To that end, the objective of the National Energy and Climate Plan (NECP) is to achieve a reduction in emissions of at least 20% in 2030 compared to 1990.

Sectors subject to Emissions Trading Scheme **(ETS) will contribute with a decrease of emissions in 2030 of 61%** compared to 2005, while **non-ETS sectors** (residential, transport, agriculture, waste, fluorinated gases and industry not subject to emissions trading) **will contribute with a mitigation of 39% in 2030** compared to the levels in 2005.

	EE targets (Mtoe)	2017 data	Target 2020	Target 2030
NECP overall targets[21]	Primary energy consumption	125.6	122.6	98.2
	Final energy consumption	84.2	87.2	73.6

The sectors of the economy that, in absolute numbers, will reduce their emissions the most in this period (2020 – 2030) are those of **electricity generation** (36 MtCO2-eq) and **mobility and transport** (27 MtCO2-eq).

Renewables (RES) are expected to play an important role in the Spanish strategy (additional 59GW of electricity from RES are expected in the planning period), in fact by 2030 the share of RES in the electricity system will reach 74% (in 2017 it was 46%) with a major contribution of **wind energy and solar photovoltaic (PV)**.

	Context/targets	Existing and planned actions/priority objectives
Residential Sector	• the sector will contribute to **18% of 2021 – 2030 Spanish Final Energy (6.73Mtep)** • **Consumption savings** In 2021 – 2030 the **EE improvement of 1,2mln dwellings** is expected	Existing measures (list of): • One of the most important measure for EE in residential buildings is the **Programme of aid for the energy upgrade of existing buildings** as a reference point. It was launched in Spain in October 2013 under the title of the PAREER programme, extended in May 2015 as PAREER-CRECE, and in force until 2018 under the title PAREER II. The programme is supported with resources of the POPE and the National EE Fund. The programme combines grant and repayable assistance and it is managed by the national energy agency (IDAE) • Another important programme is the **2013 – 2016 *national plan to promote rental housing, building renovation and urban regeneration and renewal***, that allocated circa EUR 280mln over the 2014 – 2016 period for renovations[22]

		• With respect to **revolving resources**, the national promotional bank (**ICO**) has a dedicated credit line for EE interventions (*ICO Financing Facility for renovation)* that provided circa EUR 128mln in the 2014-2016 period[23] New planned measures/priority objectives (NECP): • Spain has the target to **renovate 1.2mln dwellings** during the 2021 - 2030 period (with annual renovation targets starting with 30.000 dwellings in 2021 and ending with 300.000 in 2030). **Public resources** to support EE in residential buildings are expected to be circa **EUR 5.5bn** (ESIF is expected to play an important role) to support an **overall investment of EUR 22.4bn**. Several measures are expected to be used to reach that objectives, including fiscal incentives, legislative reforms to simplify financing to home owners associations, direct public incentives, etc. (details of the supporting measures will be provided in the long term renovation strategy, to be produced in 2020). The **PARER** programme (described above), is expected to be continued and to be **complemented** with local offices providing **awareness raising** and **technical support** for the project preparation and deployment. • Measures to **renovate residential equipment** are also envisaged (circa 6.6mln new home appliances are sold each year) with the aim of increasing their energy efficiency). Public support to support the purchase of appliances is not envisaged
Public Sector	• **Every year** (during the 2021 – 2030 period) **300,000 sqm** of floor area of public buildings of the General State Administration are expected to be **renovated** (this target is higher than what required by the EE directive) • **Regions and Local Authorities** will also be obliged to renovate part of their buildings (**3% of their buildings surface per year)**	Existing measures: • OP backed **grants** for EE in public buildings have been implemented and are in place. These are channelled at national level through the POPE, and at regional level through the Autonomous Communities' operational programmes New planned measures/priorities (NECP): • Support to **EE investments to renovate buildings used for services (private and public**) is envisaged. For public buildings, this will be done combining (i) an obligation for Autonomous Communities and local administration to renovate 3% of the floor area of public buildings every year; and (ii) and incentive scheme that could be similar to the afore-described PARER programme. Public support schemes (e.g. grants and dedicated financing) are envisaged, with a dedicated public budget of 2.2bn (mainly from ESIF) to support investment of EUR 3.7bn • EE measures are envisaged for **cooling equipment and large air-conditioning facilities** in the **services sector** (e.g. airports, hospitals, shopping centres, offices, grocery stores, shops and

		retail areas, etc.) and **public infrastructure** (e.g. street lighting systems, water treatment facilities, etc.). Public support schemes (e.g. grants and dedicated financing) are envisaged, with a dedicated public budget of 3.9bn (source not defined) to support investment of EUR 6.3bn
Industry	• During **2021 – 2030** industry is expected to generate **10.3Mtoe** of **energy savings** (28% of cumulative savings of the overall program)	<u>Existing measures:</u> • Several measures supporting EE in industry have been developed and/or are in place in Spain, also with the support of **ESIF resources**, channelled through POPE at national level and through regional OPs at Autonomous Community level. • Among the various measures, the **National Energy Efficiency Fund** (NEEF) managed by IDAE plays a crucial role <u>New planned measures/priorities (NECP):</u> • Measures are envisaged to facilitate the use of **final energy saving technologies**, mainly in SMEs and large companies in the **industrial sector** (especially non-ETS). These will include public support programmes (grants and soft loans) and will be funded wither though the NEEF or from other sources (including ESIF). **Overall investment**s have been quantified in circa **EUR 7.4bn** with a **public support of EUR 1.6bn**

3. Market failures, main issues and barriers to investment

A number of specific issues hindering EE activities in Spain are briefly reported in the following table. To the extent possible, the main potential implications of the COVID-19 crisis on barriers to EE investments have been considered.

	Financial issues and gaps	Non-financial issues
Residential Sector	• Barriers preventing EE investments are typically related to: – **limited financial resources** to devote to EE initiatives (in particular for poor households). The COVID-19 crisis could have a further negative impact as it could reduce further households' disposable income/ financial resources. – **limited financial returns of EE interventions** (especially for deep renovations). This could be particularly relevant in Spain, considering (i) that a relevant part of the country benefits from mild weather conditions with implications on the return of EE investments; and (ii) that the average consumption per dwelling in Spain is one of the lowest in Europe. • Due to the uncertainty about future economic conditions, generated by the COVID-19 crisis, households may decide to postpone long-term investments, such as EE renovations. • Based on (pre-crisis) discussions with local banks, it is reported that **credit institutions are liquid and lending activities are well developed** (including to households). This context may change due to the COVID-19 crisis, and banks may become more selective in their lending activities to households. • There are areas where financing gaps have been reported, in particular **banks report not to lend to Home Owner Associations** (*comunidad de vecinos*) due to the undefined juridical status of that entities (this is a major issue as the large majority of dwellings in Spain are located in multi-apartment buildings).	• Typical non-financial barriers preventing EE investments are related to: - limited awareness about benefits of EE interventions; - Difficulties, especially in **multi apartment buildings** (that are the large majority of residential buildings in Spain) to **agree on renovation activities.** These barriers have been confirmed during meetings with national stakeholders and the NECP seems to try to address these issues (e.g. in the 2021 – 2030 local offices should be implemented to increase awareness of the EE benefits and to support the EE projects preparation and deployment, with particular respect to multi-apartment buildings).

Industry	Typical barriers preventing EE investments in the industry sector include: • long pay-back period of several EE interventions; • difficulties to obtain financing based on cash flows generated by EE activities. The COVID-19 triggered economic recession will have a severe impact on enterprises that may have more difficulties to access the credit sector (due to the less performing economic and financial ratios). Due to future uncertainty, enterprises may moreover reduce further their investment plans and they could postponing non-core investments.	Typical non-financial barriers preventing EE investments in the industry sector include: • limited awareness about EE benefits and difficulties in structuring EE interventions; • reluctance of enterprises to use their borrowing capacity for non-core activities.
Public Sector	EE investments in the public sector can be performed either via 'traditional public procurement' or with 'alternative solutions' including for instance Public Private Partnerships (PPP) or Energy Performance Contracting (EPC) • Traditional public procurement is the most common solution and banks are reported to be keen to finance public entities at competitive conditions. Barriers to this model are represented by **budget constraints** of national and local entities[24]. • Debt capacity could become an even more relevant issue, as the Spanish debt to GDP ratio may sharply increase to support the economy during the COVID-19 triggered recession. • **PPP or EPC type transaction** are alternative ways to develop EE on public buildings and infrastructures, however **banks are reported to be** (in general) **reluctant** to co-finance these type of transactions (typically with limited or no recourse) in particular when implemented by small ESCOs.	Typical non-financial barriers preventing EE investments in the public sector are related to: • **Limited awareness** of benefits connected to EE interventions. This could be a limited issue in Spain, considering the several awareness raising campaigns and the strong push of the central government in this respect. • Difficulties in **structuring sound EE projects** (e.g. identification of the baseline, definition of EE interventions, etc.). This could be an issues in particular for small municipalities with limited technical capacities. • Difficulties with the **procurement** regulation, with the **contractual** requirements and with the **monitoring** of EE intervention. These issues are higher with 'innovative' implementation solutions (e.g. EPC).

4. Investment needs, gaps and implications for financial instruments

The total investments to achieve the NECP targets will amount to **EUR 241.4bn between 2021 and 2030,** distributed as follows:

- Renewables: 38% (EUR 91.76bn);
- **Saving and efficiency: 35% (EUR 86.5bn)**;
- Networks and electrification: 24% (EUR 58.57bn);
- Other measures: 3% (EUR 7.53bn).

Of the total investment (EUR 241.4bn):

- **EUR 196bn can be considered as additional** to the baseline (scenario with actual measures only);
- 80% will come from the **private sector**, mainly linked to the deployment of renewables, distribution and transmission networks, and a large part of the saving and efficiency measures;
- 20% will come from the **public sector**, mainly linked to energy saving and EE measures, electrification of the economy and in actions associated with promoting sustainable mobility and modal shift;

Focusing on EE, the NECP reports that additional EE investments will be equal to circa EUR 83.5bn and circa **EUR 30 billion of public funds** (national and European) will be needed to support this target.

With respect to **specific EE investment per sector**:

- Investment needed to support **EE in industry** (e.g. more efficient production processes, energy management, etc.) over the 2021 – 2030 will be **EUR 7.4bn** out of which **EUR 1.6bn would be provided with public suppor**t (funded by the National Energy Efficiency Fund, State budget and/or EU Funds) in the form of grants and soft loans;
- Investment needed to renovated **residential buildings** over the 2021 – 2030 will be **EUR 22.4bn out of which EUR 5.5bn would be provided with public support**, mainly funded with ESIF, in the form of grants and soft loans
- Investment needed to renovate **services buildings (both public and private)** over the 2021 – 2030 will be **EUR 3.7bn, with a public support of EUR 2.2bn**, mainly funded with ESIF.

The ex-ante assessment performed in 2017 includes a quantification of the potential **financing gaps**, estimated in circa EUR 10.2bn per year and mainly related to the as reported in the following table.

Autonomous Community	Financial demand (A)	Financial supply (B)	Financing gap (A-B)
Andalucía	934.19	591.27	342.92
Aragón	894.40	109.42	784.98
Baleares	131.95	93.12	38.82
Canarias	237.47	159.95	77.51
Cantabria	124.12	40.68	83.44
Castilla La Mancha	1 280.61	138.84	1 141.77
Castilla y León	1 849.07	186.77	1 662.30
Cataluña	1 042.67	653.09	389.58

Ceuta	70.37	5.58	64.79
Comunidad Valenciana	601.52	352.31	249.20
Extremadura	758.30	82.09	676.21
Galicia	724.34	224.93	499.42
Comunidad de Madrid	3 799.62	661.04	3 138.57
Región de Murcia	191.21	100.10	91.12
Melilla	34.51	6.17	28.34
Navarra	326.91	58.11	268.80
País Vasco	476.92	208.67	268.25
Principado de Asturias	263.58	72.65	190.93
La Rioja	235.21	29.43	205.77
Total Spain	**13 976.95**	**3 774.23**	**10 202.73**

The largest part of needs are reported to be in the residential sector (where 65% of the overall investment need was reported), followed by the public sector (10% of total potential demand) and industry (8%). In terms of regions, needs appear to be concentrated in: *Comunidad de Madrid; Castilla y León; Castilla La Mancha* and *Cataluña* (accounting for 57% of total potential demand/investment needs).

Based on barriers and financing gaps reported in the previous section, the possible **implications for financial instruments** have been summarise in the following table.

Horizontal implications for financial instruments

- FIs need to include (or to be supported by) a **technical assistance component** (to promote EE benefits, to facilitate the decision making process, and to prepare/monitor EE projects);
- **Combination of grant and financial instrument** has been reported as key to incentivise EE investments, in particular in the residential sector
- An important obstacle to develop large scale financial instruments to support EE is related to the **regional allocation of ESIF resources**, that does not always reflect the allocation of EE investment needs. The SME Initiative developed in Spain in the current programming period had **mechanisms allowing for a mutualisation** - among regions - of losses occurred on invested **ESIF resources**. Similar models could be explored in the next programming period, to allow EE financial instruments to be effectively rolled out at the national level

Residential sector	Public sector	Industry
• Banks are reluctant to lend to **Home-Owner-Associations**, financial instruments can play a very important role to	• Financial instruments could support the **development of the EPC** model in the public sector, providing **technical**	• EE is perceived as a non-core investment for industry enterprises that prefer to save their debt capacity for core

support these recipients (thus unlocking EE investments in multi-apartment buildings • Large facility management companies reported to already perform EE renovations in residential buildings (mainly multi-apartment buildings) with innovative financing solutions (e.g. **ESCO model, third party financing**), financial instruments could support developing these solutions, involving also smaller enterprises	**support and financial support** both directly to Public Sector Entities (e.g. municipal lending) and to private or public-private entities (loans and/or equity financing) • Discussions are in place to develop solutions to develop and finance **local energy communities**, although a well-defined model has not yet been developed, financial instruments are expected to play a role in that context	investments. In this context financial instruments could play a very important role by – Supporting enterprises in **understanding the financial benefits of EE**; and – Developing solutions to **increase the debt capacity** of enterprises for EE investments (e.g. **equity** investments, **forfaiting**, etc.)

5. ESIF resource, existing financial instruments and main grant programmes

Spain, through 64 national programmes, benefits from ESIF funding of **EUR 39.8bn** (circa EUR 856 per person) of which, **EE related support** is estimated in **EUR 495.4m**[25].

In the 2014 – 2020 period, Spain contributed **EUR 1.1bn**[26] **of its ESIF** (EUR 953.5mln from ERDF and EUR 127mln from EAFRD) **to financial instruments**, however **a very limited number of FIs operating in the EE sector** have been developed.

ESIF financial instruments

There are in particular two financial instruments that could be of interest: (i) a financial instrument operating in the EE sector in the Canary Islands; and (ii) the financial instrument operating in the urban development and EE in Andalusia. Both cases are presented in the following boxes.

Financial instrument for EE in SMEs in the Canary Islands

The regional **ERDF OP** of the Canary Islands foresees the use of FI in the following thematic objectives:

- TO 1 (1.b - RDI and SMEs) with an endowment of EUR 21m for loans of equivalent instruments;
- TO 3 (3.a - support to enterprises) with an endowment of EUR 7.8m (for loans) and EUR 5m (for guarantees); and
- TO 4 (4.b – RE/EE in SMEs) with an endowment of EUR 7.5m to loan of equivalent instruments.

The ex-ante assessment performed for the Canary islands[27] identifies the potential structure of each financial instrument. With respect to the financial instrument to support EE/RES in SMEs, these are the main recommendations: (i) the instrument should support EE in the buildings sector and target recipients are households and homeowners associations. Based on available information:

- the financial instrument has started its activity in the beginning of 2019 and it is managed by the regional agency SODECAN;
- The amount allocated to the financial instrument is EUR 6.2m of which ERDF covered EUR 5.3m;
- The financial instrument provides unsecured loans with up to 15 years tenor to cover up to 85% of the investment costs;
- As of the end of the second quarter 2019 transactions supported by the financial instrument were EUR 2.4m (EUR 2.1m ERDF).

Andalusia urban development fund

During the 2007 – 2013 programming period, the Andalusia region developed a **JESSICA financial instrument** with an EUR 79,4m initial endowment (funded with OP resources) targeting urban development projects and providing different type of financing: **loans, with equity and quasi equity**.

The fund was set-up and deployed with the support of the EIB, that acted as Holding Fund and selected financial intermediaries responsible for the management of the urban development fund.

The Urban Development Fund was managed by a **professional private equity fund manager** (GED Capital) that developed a strategy based on a combination of financial products (e.g. equity, quasi equity, loans, etc.).

Several investments were made in **PPP vehicles** (e.g. concessionaires) created to build, operate and finance the **regeneration of urban areas/buildings**. Transactions included (i) the construction and maintenance of Cordoba's Courthouse; (ii) the concession for the refurbishment/management of the old station of San Bernardo, in Seville; etc.

Considering the results of the urban development fund, in the second half of 2018 the Andalusia Region entrusted the EIB as manager of a **EUR 250 million** Fund of Funds (2014 – 2020 OP) to invest in Sustainable Urban Development and in EE projects (circa EUR 100m are expected to be invested in this sector) and in the second half of 2019 the fund manager was selected and started operating.

During the **current programming period** it should be reported the implementation of the centralised instrument PF4EE, that in Spain is focused on the hotel sector, as briefly presented below.

PF4EE Spain

Private Finance for Energy Efficiency (PF4EE) instrument is a joint agreement between the EIB and the EC which aims to address the limited access to adequate and affordable commercial financing for EE investments. The instrument is managed by the EIB and funded by the Programme for the Environment and Climate Action (LIFE programme). The PF4EE instrument provides:

- a portfolio-based credit risk protection provided by means of cash-collateral;
- long-term financing from the EIB (EIB Loan for Energy Efficiency); and
- expert support services for the Financial Intermediaries (Expert Support Facility).

PF4EE operates through financial intermediaries across the EU: currently, eight national banks provide PF4EE credit lines. In Spain PF4EE was launched in 2016 and it is managed by banco Santander, that created the loan product '*Préstamo BEI Eficiencia Energética*' which is backed by PF4EE. Through this loan product, clients can access financing for EE projects at preferential interest rates and by means of simple processes.

In view of the relatively small investment amounts that go along with energy efficiency projects conducted by self-employed individuals and SMEs, simplification and standardization play a key role in Banco Santander's approach. One important factor in this approach is the '*simulador*', a customised version of the PF4EE Web-Check Tool which can be accessed on Banco Santander's website. The tool enables the online validation of projects and illustrates to customers how they can reduce their energy consumption even through small actions

In the 2007 - 2013 programming period an EE financial instrument was developed at the national level: **JESSICA FIDAE**. JESSICA FIDAE received an endowment of circa EUR 127,6m and it was managed by the EIB (Holding Fund) and deployed via a number of Urban Development Fund (UDFs). The instrument targeted different type of recipients and financial conditions applicable to each project were determined by the UDF managers. In general, up to 70% of the eligible expenditure was financed, with the limit of the budget available in each Autonomous Community. The amortization arrived until 15 years, with up to 3 of grace period. The instrument encountered some difficulties, including the lack of mature projects, the limited experience of involved banks to finance EE investments and the complex reporting requirements. The programme, that was initially thought to finance private investments, was then allowed to support EE in the public sector and that allowed to increase the investment results of the instrument.

During 2017 – 2018, following the delivery of the **ex-ante assessment** (recommending the setup of national financial instrument for EE), discussions occurred with IDAE regarding the setup of a Smart Finance for Smart Buildings (SFSB) type financial instrument, however a decision not to implement the financial instrument was finally taken. This was due, among others, to:

- the regionalised allocation of the smart growth OP, that would have imposed to concentrate financial instrument investments in southern Spanish regions, where absorption could have been critical;
- the perception of difficulties connected with the combination of grant and financial instrument resources (that was found to be needed in order to properly support EE investments).

Main ESIF grant programmes

ESIF backed programmes are related to both regional Operational Programmes (OP) and to the national multi-regional programme (POPE).

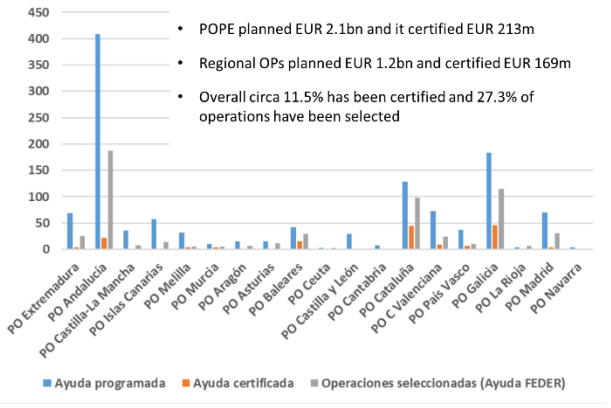
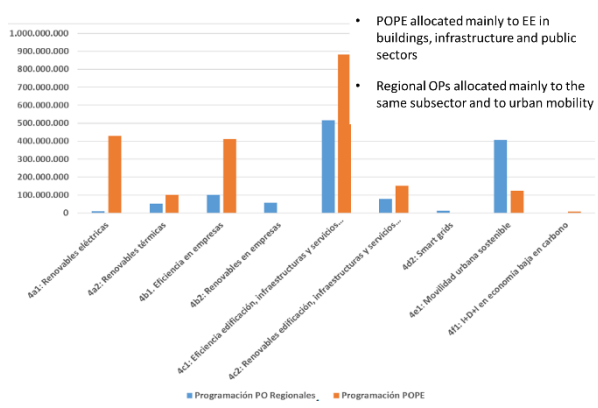
The most important programme is the **POPE** (latest version approved on 12/12/2018) that envisages a contribution to the TO4 of circa **EUR 2.1bn ESIF** a national co-financing of circa EUR 975m with an overall OP amount closer to **EUR 3.1bn**.

In terms of geographical allocation: (i) transition regions receive 55% of all ESIF support and circa 47% of the overall OP allocation or EUR 1.4bn; (ii) more developed regions receive 41% of all ESIF support and circa 51% of the overall OP allocation or EUR 1.5bn; and (iii) less developed regions receive 3% of all ESIF support and circa 3% of the overall OP allocation (EUR 81m).

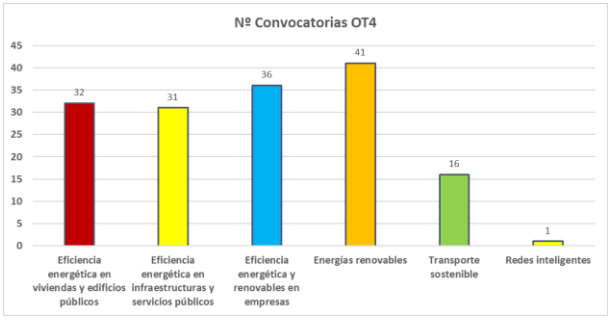
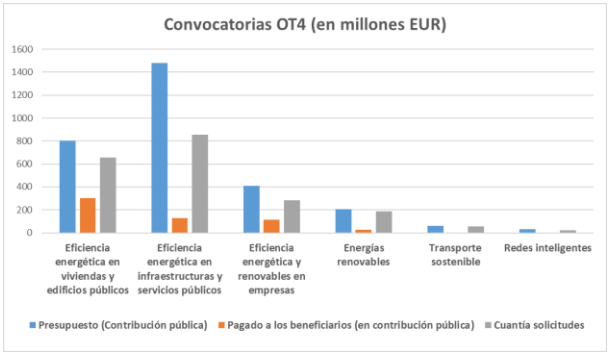
Regional OPs play also a big role, with an ESIF allocation of circa **EUR 1.2bn** related to the TO4.

Based on information reported in a document presented in September 2019 by the Directorate General of EU Funds, during the national meeting of the so-called REBECA network:

- resources (both POPE and regional OPs) are mainly allocated to **support EE in buildings, infrastructure and public services** (almost EUR 900m POPE and more than EUR 500m regional OPs);
- the **level of certified expenditures is low** and equal to circa 11.5% of the allocated ESIF.

Planned allocation and certified expenditures (TO4)	POPE and regional OPs TO4 allocation to sub-sectors
	

Another interesting information, reported in the aforementioned document refers to resources already committed via calls for tenders. Based on a survey performed by the DG of EU Funds (prior to September 2019), there were 157 calls for tenders with an underlying potential allocation of more than EUR 2.9bn.

Open calls for tenders per sub-sector	Open calls TO4 per sub-sector (EUR m)
	

The **low absorption of TO4 ESIF** resources has been addressed to **difficulties** related to both the **administrative process** (e.g. the novelty of the TO4 compared with previous programming period; the complexity of regulation; the many small scale initiatives; the complex procurement process; etc.) and to the sectorial issues (e.g. lack of interest for EE investments; overlaps between national and regional programmes; difficulties in understanding the eligibility of some operations, etc.)

PARER programme

Among the various grant programmes developed in Spain in the current programming period, the most relevant (in particular for EE in buildings) is the so called 'Supporting programme for the energy renovation of existing buildings' (PARER). The measure is managed centrally by the national (IDAE) and it combines resources of the POPE and the National Energy Efficiency Fund.

The programme started in 2013 (PARER) and it was continued over time with PARER-CRECE and PARER II (that was closed on December 2018) and based on the presentation given by IDAE on September 2019 in the context of the REBECA network, it will be continued with the PARER III.

The programme supports both EE renovations in buildings (e.g. thermal envelope, lighting installations, etc.) and renewable energies (e.g. solar thermal energy and geothermal energy) with the minimum requirement of increasing of a least one letter the energy classification of the building.

Beneficiaries of the programme include, among others: (i) owners of existing buildings; (ii) home owner associations (*comunidad de vecinos*); (iii) ESCO companies. Support is provided as the combination of soft loans (funded with resources of the national EE fund) and grants (funded with OP resources) to finance investments included between EUR 30,000 and EUR 4m.

Conditions of soft loans include an interest rate equal to Euribor and a tenor of up to 12 years (including 1 year of grace period). The following table summarises the intensity of the grant/loan combination.

Type of intervention	Max grant	Max loan
Type 1. Improvement of the EE of the thermal envelope	30%	60%
Type 2. Improvement of the EE of thermal and lighting installations	20%	70%
Type 3. Replacing conventional energy with solar thermal energy.	30%	60%
Type 4. Replacing conventional energy with geothermal energy	30%	60%

Additional grant support can be provided depending on social conditions of the recipients and EE targets, as reported in the following table[28].

TYPE OF ACTION	BUILDING USE	MONEY ALLOWANCE WITHOUT CONSIDERATION					
		BASE AID	% ADDITIONAL AID				
			Social Criteria	Compreh. Action	Energy Efficiency		
					"A" Final Rating	"B" Final Rating	Two-letter Upgrade or Higher
Upgrade of the energy efficiency in the thermal envelope.	Household	30% (limit 6 000 €/ household)	15%	20%	15%	10%	5%
	All other uses		0%	20%	15%	10%	5%
Upgrade of energy efficiency in thermal & lighting installations.	Household	20%	0%	0%	10%	5%	0%
	All other uses		0%	0%	10%	5%	0%
Replacement of conventional energy by thermal biomass in building thermal installations	Household	25%	5%	10%	0%	0%	0%
	All other uses		0%	10%	10%	5%	0%
Replacement of conventional energy by geothermal energy in building thermal installations	Household	30%	10%	15%	0%	0%	0%
	All other uses		0%	15%	10%	5%	0%

As reported in the following table (based on the presentation given by IDAE on September 2019), the PARER CRECE and PARER II programs received 2,578 applications for an overall request of grant and soft loans of **EUR 355m.** Applications were concentrated in the Basque Country, Asturias and Comunidad de Madrid.

Based on available information this programme is achieving interesting performances and it has characteristics that makes of it a candidate to be transformed into a financial instrument/grant scheme in the next programming period, in particular considering the new flexibility that will be given by the capital rebates.

As anticipated in previous sections, one of the barriers to support EE renovations in buildings is given by the unavailability of banks to lend to home-owner-associations as these are perceived to be too risky.

The PARER programme is *de facto* the only lending solution for these entities to receive credit and it has a relevant potential to be scaled up in the next programming period.

NOTES

[1] EUROSTAT; Population on 1 January by age and sex [demo_pjan]; extracted on 13/02/2020
[2] National Energy and Climate Plan
[3] EUROSTAT; Real GDP per capita [SDG_08_10]; extracted on 13/02/2020
[4] EUROSTAT; Final energy consumption (Europe 2020-2030); Energy efficiency [nrg_ind_eff]; extracted on 13/02/2020
[5] Ratio between: EUROSTAT; Final energy consumption (Europe 2020-2030); Energy efficiency [nrg_ind_eff] and EUROSTAT; Population on 1 January by age and sex [demo_pjan]; extracted on 13/02/2020
[6] EUROSTAT; Energy productivity [T2020_RD310]; data in Euro per kilogram of oil equivalent (KGOE); extracted on 13/02/2020
[7] EUROSTAT
[8] This data refers to technical final energy savings, which excludes savings achieved thanks to economic factors (e.g: a recession that reduces industry's production and therefore it lowers the energy consumption) or behavioural factors (e.g: higher temperature during that year).
[9] Spanish Ministry for Transport and Urban Agenda
[10] Ministry of infrastructure (total dwellings per region)
[11] Odyssee database, Consumption per dwelling with climatic corrections, year 2016
[12] Odyssee database, Consumption per dwelling with climatic corrections, year 2016
[13] *Odyssee, 2019*
[14] *Odyssee, 2019*
[15] EU Energy Poverty Observatory; Member State Report; Spain. June 2020
[16] National Energy and Climate Plan
[17] Central Intelligence Agency, the world fact book
[18] Central Intelligence Agency, the world fact book
[19] EUROSTAT
[20] This data refers to technical final energy savings, which excludes savings achieved thanks to economic factors (e.g: a recession that reduces industry's production and therefore it lowers the energy consumption) or behavioural factors (e.g: higher temperature during that year).
[21] as reported in National Energy and Climate Plan
[22] 2017 Update of the long-term strategy for energy renovation in the building sector in Spain (page 23)
[23] 2017 Update of the long-term strategy for energy renovation in the building sector in Spain (page 27)
[24] based on the EIB analysis of municipal investments, the main obstacles for the implementation of the infrastructure investment activities for Spanish municipalities are a narrow 'budget'
[25] Data provided by DG Regio based on an analysis of fields of intervention
[26] www.fi-compass.eu/financial-instruments/Spain
[27] Gobierno de Canarias, Arenal Grupo Consultor S.L., Evaluación ex-ante de los instrumentos financieros del Programa Operativo de Canarias FEDER 2014-2020, 2016
[28] JRC, Accelerating energy renovation investments in buildings; 2019

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