European Energy Network

A voluntary network of European energy agencies

Smart finance for the water&energy nexus

Benchmark and recommendations on innovative financial mechanisms for cities and buildings

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About the Study

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EXECUTIVE SUMMARY

Water efficiency and WEN are key contributors to reach EU decarbonization targets and financing mechanisms are cornerstone to achieve much needed water and energy savings through water and energy nexus (WEN) improvement measures in buildings and cities.

The implementation and deployment of water and energy efficiency solutions, such as new decentralized solutions for water and energy production, in cities and buildings, require significant investments. Funding and financing instruments can have a critical role to enabling and increasing the magnitude of these investments. However not many studies focus on adapting these mechanisms towards combined water and energy savings.

This study delves into funding and financing options for water and combined water and energy efficiency in the built environment, under a WEN approach, identifying existing mechanisms, challenges to implementation, and solutions to overcome them. It also reflects on the role that EnR Agencies can play in facilitating improvement and application of these mechanisms.

Through a designed survey for EnR Agencies, this study gathers different perspectives about finance and investment funds adopted by some countries. Additionally, through a literature and technical review, aims to bring new light on a set of existing mechanisms allowing a benchmark between the different type options available.

As a conclusion, a set of examples are analysed, barriers identified, and actions recommended to be adopted by European Energy Agencies. EnR Agencies can be critical in confirming investment eligibility, aligning with the EU Taxonomy, and tracking efficiency gains.

There is also opportunity for water utilities to innovate on their business models, to a greater focus on water efficiency and WEN services provided to their customers.

Finally, there are several smart and innovative funding solutions already implemented in different countries at a European and international level, worth to be investigated and replicated by other European countries.

1. FRAMEWORK AND OBJECTIVES

Interdependencies between energy and other resources, particularly water, jeopardizes mitigation and adaptation goals, driving the energy sector to look beyond energy. Growing competition for water between energy, consumers and other economic activities requires water efficiency and conservation practices in all sectors, paving the way to new water&energy nexus (WEN) opportunities, with higher impact of WEN approaches versus isolated ones.

Implementation and deployment of water and energy efficiency solutions, such as new decentralized solutions for water and energy production, in cities and buildings, require significant investments from local authorities, building industry and homeowners, as well as water and energy supply services' adaptation and response to new requirements and opportunities. Maintaining and scaling-up these investments towards a systematic transformation and integrated approach seizing the WEN opportunities, calls for smarter market-based financing solutions focused on energy, water and WEN combined savings.

Recognising the role that water plays in the overall energy transition, there is an increasing emphasis on initiatives exploring the connection between water and energy. However, water and energy policies remain largely disconnected at EU and Member State levels[1]. The same happens with financing instruments, particularly smart finance and innovative solutions for cities and buildings, with very few progresses made on new financing options for WEN.

EnR Agencies have a longstanding experience of involvement in research and implementation of new solutions, particularly on energy transition and climate adaptation in buildings and cities, for which investment and smart financing are keystones. Opportunities arising from the current shift in European policy and supporting mechanisms towards sustainable finance are to good do be missed as leverage to achieve combined water and energy efficiency.

This study on smart financing options focuses on the interdependencies between water and energy consumption, specifically WEN demand-side management, on the built environment. The built environment**,** considering both new construction and retrofit, encompasses different targets such as housing, public administration, services buildings, public and green spaces, all targeted by European targets and funding, for which main policies are examined.

It explores financing mechanisms solutions, providing examples of smart and innovative financing and incentives, implemented both in Europe and internationally, to foster combined energy and water efficiency in buildings and cities, as well as separate approaches that may be transferable into integrated ones. The study also aims to provide an initial benchmark on existing solutions, identify a set of barriers for their implementation and propose potential solutions to overcome them. Furthermore, it reflects on the EnR Agencies' role in the implementation of these mechanisms towards WEN.

[1] JRC, 2019, Water & Energy Nexus In Europe https://publications.jrc.ec.europa.eu/repository/handle/JRC115853

2. METHODOLOGY

The Steering Committee of the present study, composed by six EnR agencies (ADENE, Portugal; ADEME, France; CRES, Greece; dena, Germany; EWA, Malta; RVO, Netherlands), developed the Terms of Reference for this study, identifying its scope and objectives.

A literature and technical information review was carried out to design a survey for EnR Energy Agencies, addressing smart finance on WEN. The main goal of the survey was to provide information on existing financing solutions with a focus on increasing water and/or energy efficiency in the built environment. Examples of measures for improved efficiency considered within the WEN in buildings and cities include water efficiency of the DHW (domestic hot water) distribution systems; insulation of hot water distribution networks; water and energy efficient fixtures and appliances; efficient irrigation systems; renewable water-energy solutions, including alternative water sources powered by green energy (e.g. rainwater harvesting/storm water management, grey and wastewater reuse, desalination); water and energy audits and certification schemes.

Information collected through this survey (and additional information provided by agencies not responding the survey due to lack of information or because the topic is outside their scope of action), enabled the identification of existing mechanisms as well as barriers and solutions to their application. From this analysis, a set of strategic objectives and suggested actions are drawn, which can be adopted by different stakeholders, from Energy Agencies to other national or European actors.

3. EUROPEAN POLICY AND THE SHIFT TO SUSTAINABLE FINANCING

The EU aims to be climate-neutral by 2050 – an economy with net-zero greenhouse gas emissions (GEE). In line with the EU's commitment to global climate action under the Paris Agreement there are several European policies to pursue this goal. The need to fund or finance the energy transition and climate action is cornerstone for most of them. A summary of European policies both relying on and paving the way to sustainable finance is presented in the next pages.

3.1. European Green Deal

The European Green Deal[2] is the EU's growth and recovery strategy that aims to transform Europe into the first climate-neutral bloc by 2050. Energy efficiency is a key area of action, for which investments need to be increased in all economic sectors. EU funding programmes will ensure direct co-financing of these investments and leverage private and public investments through tailored financial instruments and project development assistance.

The EU Green Deal also creates the framework for sustainable finance, paving the way to a range of related legislation: inter alia EU Taxonomy, Sustainable Finance Disclosure Regulation and Non-Financial Reporting Directives.

3.2. REPowerEU

In response to global energy market disruption caused by Russia's invasion to Ukraine, the European Commission (EC) presented the 'REPowerEU'[3] plan to accelerate the energy transition, joining forces towards a more resilient energy system. REPowerEU measures create opportunities for energy efficiency, water efficiency and WEN projects.

The **Recovery and Resilience Facility** (RRF) is at the heart of the 'REPowerEU' Plan, by supporting and financing cross-border and national infrastructures as well as energy projects and reforms, going beyond the 'Fit for 55' package goals (Figure 1). RRF plans include a minimum of 30% of climate-relevant expenditure and a building renovation flagship priority.

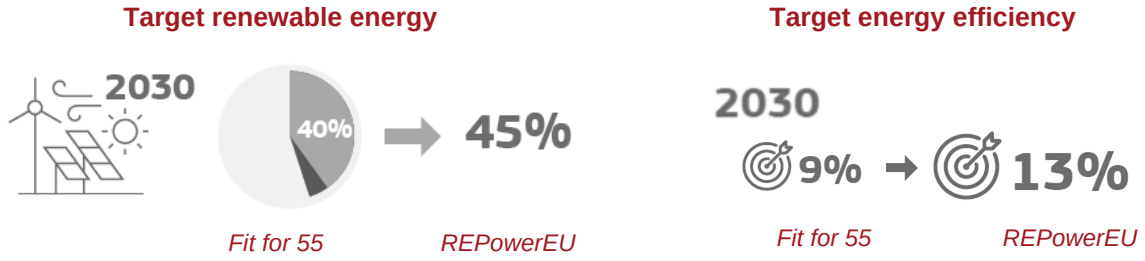


Figure 1 - Comparison of Fit for 55 and REPowerEU targets scheme

[2] https://energy.ec.europa.eu/topics/energy-efficiency/financing/eu-programmes/current-funding_en
[3] https://ec.europa.eu/commission/presscorner/detail/en/ip_22_3131

3.3. Renovation Wave

The European Green Deal recognises that renovating both public and private buildings is an essential action to drive energy efficiency. To pursue the dual ambition of energy gains and economic growth, in 2020 the strategy "A Renovation Wave for Europe – Greening our buildings, creating jobs, improving lives"[4] was published to boost renovation.

EU funding budget solutions can support the Renovation Wave in different ways:

- Through direct investments;
- By leveraging private investments;
- Through research and innovation;
- By addressing market barriers and providing technical assistance.

The **Renovation Wave** strategy was published to unite regulation, funding and technical assistance concepts that are usually addressed separately. The Renovation Wave strategy also identifies the 275€ billion of additional investment in building renovation per year.

3.4. Energy Performance of Buildings Directive (EPBD)

Europe' building stock is responsible for 40% of energy needs in Europe ─ 27% concern residential buildings and 13% service buildings ─ which corresponds to the largest share of energy consumption among economic activity sectors.

In light of this reality, the EC enacted legislation on building energy performance in the form of a Directive - the EPBD: Energy Performance of Buildings Directive - to establish a clear path that is consistent with the EU Green Deal. The EPBD focuses on the development of a sustainable, competitive, and decarbonized energy system, supported by national roadmaps with indicative targets and indicators of domestic progress, as well as public and private funding and investment.

Through the use of Energy Performance Certification and its democratisation in the European region, it is possible to:

- **Access financing at better rates and implement improvement measures;**
- **Reap tax benefits, or reduction of fees for rehabilitation.**

3.5. The EU Taxonomy of sustainable economic activities

To implement the EU Green Deal it is essential to scale up the investment in areas that promote a carbon-neutral economy, such as renewable energy and water efficiency. To do so, the EU needed a framework to classify "green" or "sustainable" economic activities, to avoid misuse of critical financial resources that should be devoted to sustainability and the

[4] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1603122220757&uri=CELEX:52020DC0662

misappropriation of these labels in greenwashing. In 2020 the Taxonomy Regulation was published and entered into force, establishing the basis for the EU taxonomy.

The EU Taxonomy[5] is a classification system for economic activities that uses a common language and a clear definition to determine when a company is operating in a sustainable or environmentally friendly manner, based on six environmental objectives.

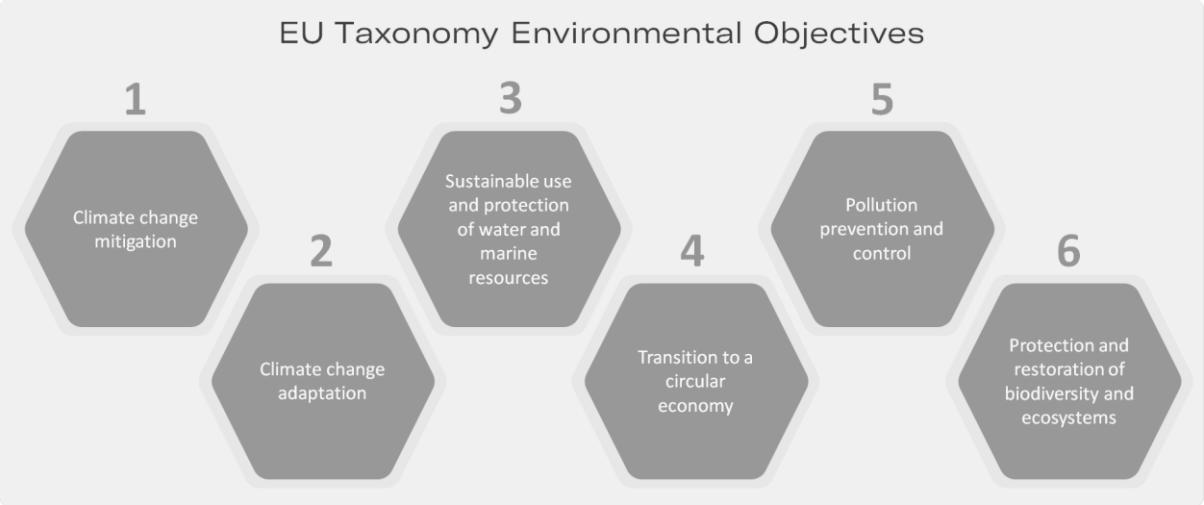


Figure 2 - EU Taxonomy Environmental Objectives

The EU Taxonomy classification of an economic activity is based on the four criteria:

1. The economic activity contributes to at least one of the six environmental goals;
2. The economic activity doesn't go against any of the six environmental objectives (the EU taxonomy key principle "Do No Significant Harm", DNSH);
3. The economic activity complies with minimum safeguards, such as the United Nations Guiding Principles on Business and Human Rights, to avoid negative social impacts;
4. The economic activity complies with the technical screening criteria developed by the EU Technical Expert Group (the Platform on Sustainable Finance).

In synthesis, only investments that comply with technical screening criteria for one of the six environmental objectives, do-no significant harm standards for the other five as well as a set of common minimum social safeguards, can be communicated as "sustainable"[6].

The goal is to strengthen sustainable finance by bringing consistency and transparency and setting a common language between investors, issuers, project promoters and policy makers. This helps investors identify green assets, set targets and align their long-term business strategies and models with European and global policy commitments and Sustainable Development Goals (SDGs) goals.

[5] https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en

[6] Naser H., Zinecker A., Hageneder C., 2021, "The EU Taxonomy - What Does It Mean For Buildings?" Programme for Energy Efficiency in Buildings (PEEB)

Based on the Taxonomy, several regulations and reporting requirements arise, such as the Sustainable Finance Disclosure Regulation (SFDR), the proposed Corporate Sustainability Reporting Directive and Capital Requirements Regulation (CRR), requesting enterprises and financial players to disclose sustainability-related information about their business operations, and on how they are incorporating sustainability risks in their policies and products, including banks' risk models and capital requirements.

As set out by the EU Taxonomy Regulation, in 2021 the **technical screening criteria**[7] were established, designed to determine when an economic activity, including **economic activities in the buildings sector**, qualifies as contributing substantially to **climate change mitigation or climate change adaptation** and for determining whether that economic activity causes no significant harm to any of the other environmental objectives. The technical screening criteria for economic activities in the buildings sector are summarized below (table 1), including accompanying do-no-significant harm standards concerning minimum water use criteria.

Table 1 - Technical screening criteria for economic activities in the buildings sector

Type of economic activity	Technical Screening Criteria	
	Substantial contribution to climate change mitigation	**Do-no-significant harm standards: Sustainable use and protection of water and marine resources**
Constructions of new buildings	• Primary Energy Demand of new construction is at least 10% lower than nearly zero energy building requirements in national measures. • Energy performance certified by **energy performance certificate**. • For buildings > 5000m2: life cycle global warming potential calculated, and level of performance is tested post construction, both disclosed to investors and clients.	Where installed, except for installations in residential building units, the specified water use for the following water appliances are attested by product datasheets, a **building certification** or an existing product label in the Union, in accordance with the following technical specifications: a) wash hand basin taps and kitchen taps have a maximum water flow of 6 litres/min; b) showers have a maximum water flow of 8 litres/min; c) WCs, including suites, bowls and flushing cisterns, have a full flush volume of a maximum of 6 litres and a maximum average flush volume of 3,5 litres; d) urinals use a maximum of 2 litres/bowl/hour. Flushing urinals have a maximum full flush volume of 1 litre.

[7] COMMISSION DELEGATED REGULATION (EU) 2021/2139 of 4 June 2021 (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2021:442:FULL&from=EN) – Technical screening criteria applied to climate change mitigation and adaptation

Type of economic activity	Technical Screening Criteria	
	Substantial contribution to climate change mitigation	**Do-no-significant harm standards: Sustainable use and protection of water and marine resources**
Renovation of existing buildings	• As applicable in national regulations for major renovations • Reduction of primary energy demand of at least 30%.	Where installed as part of the renovation works, except for renovation works in residential building units, the specified water use for the following water appliances is attested by product datasheets, a **building certification** or an existing product label in the Union, in accordance with the technical specifications: a) wash hand basin taps and kitchen taps have a maximum water flow of 6 litres/min; b) showers have a maximum water flow of 8 litres/min; c) WCs, including suites, bowls and flushing cisterns, have a full flush volume of a maximum of 6 litres and a maximum average flush volume of 3,5 litres; d) urinals use a maximum of 2 litres/bowl/hour. Flushing urinals have a maximum full flush volume of 1 litre.
Acquisition and ownership	• Buildings built before 12/2020: at least **EPC** class A, or within top 15% of national building stock expressed in primary energy demand • Buildings built after 12/2020: meet criteria for "construction of new buildings" • Large non-residential building with HVAC output >290kW: operated efficiently through energy performance monitoring and assessment	N/A

On March 2022, the Platform on Sustainable Finance published recommendations on technical screening criteria for the four remaining environmental objectives of the EU taxonomy (objectives 3 to 6)[8] followed by a supplementary report in October 2022[9].

[8] https://commission.europa.eu/system/files/2022-03/220330-sustainable-finance-platform-finance-report-remaining-environmental-objectives-taxonomy-annex_en.pdf
[9] https://finance.ec.europa.eu/system/files/2022-11/221128-sustainable-finance-platform-technical-working-group_en.pdf

3.6. Strategy for financing the transition to a sustainable economy

To enhance the EU sustainable finance framework, the new Sustainable Finance Strategy was published in July 2021[10], aiming to support the financing of the transition to a sustainable economy by proposing action in four areas:

1. Transition finance: financing the transition of the real economy towards sustainability;
2. Inclusiveness: towards a more inclusive sustainable finance framework;
3. Resilience and contribution of the financial system to sustainability: the double materiality perspective[11];
4. Fostering global ambition.

The strategy builds on the 2018 Action Plan on Financing Sustainable Growth, the Transition Finance Report by the Platform on Sustainable Finance and a consultation held in 2020 and wants to make the EU a global leader in setting standards for sustainable finance. It entails an ambitious and comprehensive package of measures to shift investments towards more sustainable technologies and businesses, an instrumental step in reaching EU climate and environmental targets. It sets out how the objectives of the European Green Deal are translated throughout the financial system and ensures actors across all sectors of the economy are able to finance their transition regardless of their starting point, complementing the critical changes in climate and environmental policies set out in the European Green Deal.

Some of the new actions are relevant for EnR agencies' work and potential role on this topic:

- Include additional sustainable activities in the EU Taxonomy;
- Extend sustainable finance standards and labels that support financing this transition;
- Work on green budgeting and risk-sharing mechanisms;
- Improve the cooperation between authorities to monitor the alignment of the EU financial system with Green Deal targets;
- Support low- and middle-income countries in their transition efforts to sustainable finance.

Under this strategy, the EC proposed the Standard for European green bonds (EuGB)[12], useful for both issuers and investors of green bonds. Environmentally sustainable bonds are recognized as one of the main instruments for financing investments related to low-carbon technologies, energy and resource efficiency. With this standard, green bond issuers will have a robust tool to demonstrate that they are funding legitimate green projects aligned with the EU taxonomy. Investors buying the bonds will be able to more easily assess, compare and trust that their investments are sustainable, reducing the risks posed by greenwashing.

[10] https://finance.ec.europa.eu/publications/strategy-financing-transition-sustainable-economy_en; https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0390

[11] The double materiality approach includes not only the effect of climate change on finance and corporate activities (materiality) but also the effect of finance and corporate activities on climate change

[12] https://finance.ec.europa.eu/publications/commission-proposal-european-green-bond-standard_en

4. OTHER RELEVANT INSTRUMENTS

Financing investments on efficiency or sustainable activities largely depend on the ability to monitor the gains triggered by a specific investment, to properly assess return on investment and design the most effective financing tools. Therefore, under the scope of this report (*smart finance and innovative solutions for cities and buildings*), sustainability and efficiency rating systems for products and buildings are useful tools to allocate funding and financing according to standardized efficiency criteria and gains, allowing to be used in different financing mechanisms to assess investment eligibility and monitoring their impact. The existence of labels, rating and certification schemes can facilitate effectiveness of a specific financing, whether the contrary might result in barriers for adoption and adequate monitoring.

For that reason, in this section, we present an overview of product labeling and building efficiency ratings and certification schemes and their application to financing mechanisms.

4.1. Product labeling

Implementation of water saving fixtures, alone, can result in up to 50% water savings in buildings, with energy and CO_2 emissions reduction by end users and urban water systems. Water and energy labelling help consumers make more efficient choices.

The Unified Water Label (UWL) is a voluntary European water and energy efficiency labelling scheme for bathroom products, promoted by the European Bathroom Forum alongside industry stakeholders, bringing together four of the five European Water Labelling schemes (from Sweden, Swiss, Portugal and the European Water Label) harmonising technical data and moving to one label under the banner of the Unified Water Label since 2017.

It is a smart tool that provides a means to identify water-using products, with a common label to allow clear, concise, and easy to understand messaging about water and energy consumption. Currently, the scheme is supported by 170 brands and holds a live database of almost 16.000 individual labelled products.

To understand consumers' needs, motivations, and willingness to choose labelled water use products, fixtures, and equipment, towards water and energy savings, the European Energy Network (EnR), developed a European consumer survey in 2022[13].

Some relevant insights from this survey are that consumers want labels for products/fixtures to help them make more efficient choices and the existence of financial support mechanisms have a positive impact in both consumers' knowledge of existing labels and willingness to choose labelled products. The same might happen to labels and certifications applied to buildings.

[13] Available at https://enr-network.org/energy-water-labelling-for-the-taps-and-showers-market-contribution-for-increased-adoption-of-efficient-water-use-products-fixtures-and-appliances/

4.2. Building Efficiency Ratings and Certification Schemes

With new regulations and reporting requirements following the EU Green Taxonomy and the EU sustainable finance framework, banks will be requested to publish their Green Asset Ratio in 2024. Also ESG risk analysis, both on lending and on stock selection, are soon to become mainstream. These ratios depend on established technical screening criteria for economic activities defined under the EU taxonomy. As seen in section 3.5., these **criteria include energy performance (provided by national Energy Performance Certificates)**, energy consumption and CO_2 emissions of existing building stock, also impacting future lending criteria. The EU taxonomy key principle "Do No Significant Harm" requires also to increasingly assess **other criteria** according to the six environmental objectives, **including technical specifications for water appliances** for non-residential buildings (for now), attested by product datasheets, a **building certification,** or an existing **product label** in the Union.

As such, green building rating or certification systems, including Energy Performance Certificates but also sustainability certificates, water efficiency certificates or water-use product labels are key enablers of the sustainable finance transition, as they rate (or reward) relative compliance or performance levels with specific environmental goals and requirements.

The certification of building sustainability, either mandatory or voluntary can be used as an assessment instrument to select projects and products to be financed or benefit from a specific financing mechanism or funding programme. The auditing process usually presents the status but also the potential improvements and their impacts, which can be used to determine investment priorities for the property owner or tenant. From the financing or funding institution's point of view, the audit results offer an impartial analysis to determine eligibility and a first estimate of return. Therefore, it is important to foster the adoption of such systems and to target the measures identified therein in the financing and funding policies to optimize investment for maximum efficiency gains. A few of these programs focus solely on energy, while others focus on overall environmental performance, including water.

In addition to building sustainability rating or certification systems, there are also the product efficiency certifications that establish standards for water-related products as mentioned in the previous section. Many efficiency product certifications are also recognized within comprehensive sustainability building rating systems such as LEED, Green Mark, BEAM Plus among others, to evaluate the performance of water-related products such as taps, toilets, showers, water fixtures, dishwashers, and clothes washing machines.

For the purpose of this report, sustainability building rating or certification systems are identified and analyzed, particularly on how they rate, or reward water uses, and energy consumption related to water use (WEN), in buildings. A few worldwide examples and their estimated impact to improve the performance of buildings and their relation to financing mechanisms are presented in the next few pages.

4.2.1. United States of America

California has implemented building sustainability standards for all major renovations and new construction of public buildings. Executive Order S-3-05 calls to reduce greenhouse gas emissions[14] 80% below 1990 levels by 2050. To accomplish this goal, Executive Order S-20-04 requires all state buildings to reduce energy usage by 20% and achieve a minimum of a Silver LEED rating.

New York City's Local Law 86[15] requires LEED certification for public buildings with construction costs exceeding $2 million. The NYC Greener, Greater Buildings Plan[16] is another example of NYC's commitment to sustainability. It requires a combination of benchmarking, energy audits, retro-commissioning, lighting upgrades and sub-metering for the city's largest buildings.

4.2.2. Middle East, Asia and Australia

In **United Arab Emirates**, local governments began introducing more rigorous codes, such as the Estidama Pearl Rating System in Abu Dhabi. They have also begun mandating the elements of the United States Leadership in Energy and Environmental Design (LEED) Rating System for buildings within Dubai's World's Jurisdiction. The LEED and Estidama assess and rate a building based on pre-defined sustainability criteria that typically include: (i) energy efficiency; (ii) water efficiency; (iii) site location; (iv) indoor environment quality and materials and (v) waste management. In Dubai, in partnership with the Dubai Electricity and Water Authority, has developed the Dubai Green Building Regulations and Specifications, which addresses key areas of sustainable building development. The regulations, which are based on international best practices, provide both voluntary and mandatory requirements within each of its sections. The regulations became mandatory in 2014, for both public and private sectors addressing new and existing buildings.

In **Singapore**, Singapore's Building and Construction Authority (BCA) - a Ministry of National Development agency established by the Building Control Act - released the 1st Green Building Master Plan in 2005. It details a phased approach to "green" both new and existing buildings in Singapore. The 1st Green Building Master Plan introduced a Green Mark Incentive Scheme rating system to assess new public sector buildings and those undergoing major retrofitting in terms of the following five key criteria: Energy efficiency; Water efficiency; Environmental protection; Indoor environmental quality; and Innovative green features. The BCA noted that since the launch of the BCA Green Mark scheme in 2005, the number of green buildings in Singapore has grown exponentially. From only 17 in 2005, green buildings grew to more than 500 buildings in 2015, equivalent 29% of Singapore's total built-up gross floor area. Based on

[14] https://www.wbdg.org/resources/greenhouse-gas-emissions-federal-buildings
[15] https://www1.nyc.gov/site/ddc/about/sustainable-design-local-law-86.page
[16] http://www.nyc.gov/html/gbee/downloads/pdf/greener_greater_buildings_plan.pdf

these figures, the BCA estimates it is on schedule toward meeting the target of greening 80% of all of Singapore's buildings by 2030.

In **Australia**, there are two main sustainability rating tools with respect to commercial buildings: (i) Green Star and (ii) the National Australian Built Environment Rating System (NABERS). Green Star is a voluntary system whose main rating tool evaluates the environmental/ecological design and construction of a building. To obtain a "green star rating," projects must meet eligibility requirements and obtain credits in nine categories, which are as follows: (i) construction management; (ii) indoor environment quality; (iii) water; (iv) transport; (v) material; (vi) land use and ecology; (vii) innovation; (viii) emission and (ix) energy.NABERS is Australia's leading building performance rating, delivering ratings for Energy, Water, Carbon Neutral, Waste, Indoor Environment and Renewable Energy, across building sectors like hotels, shopping centres, apartments, offices, data centres, and more. For Apartment Buildings with at least four apartments on at least two floors, NABERS provides Energy and Water Ratings in a scheme, including a star rating for the energy and water consumption of the common property.

4.2.3. Europe

In the **United Kingdom**, BREEAM maintains its status as the preferred sustainability standard for new and existing commercial real estate. Over half the local planning authorities in the UK were specifying BREEAM in their local plans, which means that planning decisions need to give material consideration to sustainable development and require that developments meet specified BREEAM minimum standards. BREEAM is increasing its alignment with the EU Taxonomy as stated in an online comprehensive Guide to the EU Taxonomy and BREEAM.[17]

In **Germany**, the most widely used certification is the one awarded by the German Sustainable Building Council (*Deutsche Gesellschaft für Nachhaltiges Bauen* or DGNB). Under this voluntary system, the quality of a building is assessed over the entire life cycle of the building. Particularly being certified in this assessment are some 50 sustainability criteria including ecology, economy, socio-cultural aspects, technology, process workflows and site. The system is based on voluntarily outperforming the concepts that are common or usual today. If a performance requirement is met, the DGNB awards the DGNB certificate in bronze, silver or gold. In addition, there is the option of simple pre-certification in the planning phase. Buildings of the federal government are certified in accordance with the Evaluation System Sustainable Buildings (*Bewertungssystem Nachhaltiges Bauen* or BNB). The certification system and rules are similar to the DGNB system but have been tailored to the specifics of federal government buildings. Certification for new buildings in accordance with the above standards is not mandatory in Germany.

[17] https://www.bre.group/a-guide-to-the-eu-taxonomy-and-breeam/

In **Portugal**, the Portuguese Energy Agency (ADENE), developed AQUA+ Water Rating for Buildings, a voluntary scheme to rate water use, water reuse and water-energy nexus performance in buildings (households, hotels and soon available for commercial buildings), based on infrastructural evaluation, ranging from F (less efficient) to A+ rating (more efficient). The system draws a parallel from the mandatory national Energy Performance Certificate (EPC), with water efficiency audits made available by external trained and qualified experts. AQUA+ is issued and comprehensively detailed for each property (individual households, including common property assessment; full hotel buildings and full commercial buildings), providing guidance on improvement opportunities and good practices for building design and renovation and calculating water and energy saving. AQUA+ is listed as the tool to achieve water and water-energy efficiency targets in national strategies (eg. Long-term renovation strategy, Sustainable Tourism Plan 20-23, Algarve water efficiency plan) and associated funding mechanisms (eg. Energy and water renovation funding programme provided by Portuguese Environmental Fund – see section 5.3.). Hotels with A+ Class according to AQUA+ must comply with demanding criteria (attested in buildings certificate), including specified water use for water appliances that are aligned with the technical screening criteria for economic activities in the buildings sector referred in section 3.5. Additionally, AQUA+ introduces other criteria (including irrigation, hot water management, wastewater reuse) that lead to substantial water savings and related direct energy savings, thus contributing to reduction of primary energy demand.

5. FINANCING MECHANISMS

To identify examples and benchmark existing financing solutions with a focus on water and/or energy efficiency in the built environment, it is important to firstly understand the financing models underneath each solution.

This section presents an overview of “traditional” financing products (e.g. loans and leases), “specialized” products (e.g. on-bill and on-tax financing) and other mechanisms, like subsidies.

Traditional financing mechanisms are commonly used to pay for energy or water efficiency as any other goods or services, whereas specialised financing mechanisms are designed to support energy or water efficiency (or clean energy installations), and/or to overcome specific market barriers. The typology of financing mechanisms for water and energy efficiency can be categorized as follows (**Error! Reference source not found.**)[18]

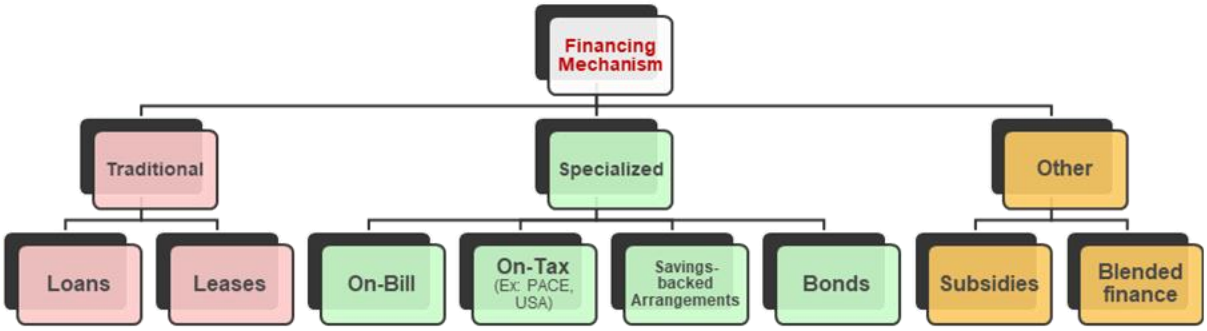


Figure 3 - Types of financing mechanisms

These mechanisms are described in this section, including examples provided by EnR Agencies, as referred in the factsheets in Annex (Section 8), and others identified in literature review under this study, followed by brief analysis and highlights according to this study goals.

5.1. Traditional Financing Mechanisms

A) Loans

- **Green Loans |** With a loan, lenders have no recourse to take possession of a borrower’s assets in case of nonpayment. A green loan is a form of financing that enables borrowers to use the proceeds to exclusively fund projects that make a substantial contribution to an environmental objective. To be called a green loan, a loan should be structured in alignment to the Green Loan Principles. Categories of eligibility include renewable energy, energy efficiency, climate change adaptation and green buildings that meet regional, national, or internationally recognized standards or certifications.

[18] Adapted from Leventis, G., *et al*: Current Practices in Efficiency Financing: An Overview for State and Local Governments. Ernest Orlando Lawrence Berkeley National Laboratory (2016)

Table 2 – Green Loans examples applied to energy efficiency based on EPCs

Geographical scope	Example	Reference
National (Malta)	APS Green Finance	Factsheet #A1
National (Portugal)	UCI Soluções Vive Green *UCI Live Green Solutions*	Factsheet #A2
National (Portugal)	CGD - Vantagem Imóveis Energeticamente Eficientes *CGD – Energy Efficient Real Estate Advantage*	Factsheet #A3

One of the examples in the survey, provided by the EWA (Malta), is the APS Green Finance, a lending mechanism that enables bank customers, both individual and commercial, to finance targeted building solutions such as PV panels, HVAC systems, efficient lighting systems etc. These solutions shall have an impact on the Energy Performance Certificate (EPC) classification, and/or have an ecolabel that certify energy performance improvements. This loan covers all types of buildings and is provided through the European Investment Fund (EIF)[19], which comes with benefits like reducing collateral requirements due to the presence of an EIF guarantee tied to each facility, as well as an interest rate subsidy, paid directly by EIF. This is therefore also an example of blended finance, where the risk for the lender is reduced by the existing guarantee. EIF is a specialist provider of risk finance to benefit small and medium-sized enterprises (SME) across Europe and is part of the European Investment Bank (EIB) Group.

ADENE (Portugal) identified at least two banks providing mortgage loans with advantageous financial solutions for new properties with A+ and A rating according to the nacional EPC. These loans can also be used for energy renovation of existing buildings.

Both examples, although targeting specifically energy efficiency (and indirectly water efficiency, e.g. heat pumps), could easily be adapted to also cover water efficiency, provided that a similar certification could be used to assess eligibility.

- **Green or Sustainability linked loans |** A sustainability-linked loan (SLL) is defined as any type of loan instrument and/or contingent facility (e.g. bonding line, guarantee line, letter of credit) that incentivises the borrower's achievement of ambitious, predetermined sustainability performance objectives. A borrower's sustainability performance is measured using sustainability performance targets (SPTs), which include key performance indicators, external ratings and/or equivalent metrics that measure improvements in the borrower's sustainability profile. Categories of eligibility include renewable energy, affordable housing, sustainable sourcing and energy efficiency.

[19] https://www.eif.org/who_we_are/index.htm

Table 3 – Green or Sustainability linked loans examples

Geographical scope	Example	Reference
European	ELENA	Factsheet #A4
Australia	NABERS Sustainable Finance Criteria	Factsheet #A5

ELENA[20] is a specific European Investment Bank technical assistance and financing facility, which supports investment programmes above €30 million with a three-year implementation period for energy efficiency (residential projects included) and four-year period for urban transport and mobility. Although it doesn't target directly individual homeowners or property owners, due to the minimum investment limit, it does encourage local government, financial institutions, national governments or any public corporations to develop and bundle projects directed to those targets to reach this minimum threshold.

NABERS, an Australian efficiency rating described in section 4.2., has launched **NABERS Sustainable Finance Criteria**[21]. This Criteria uses NABERS data, which captures a substantial amount of Australian commercial buildings, to help identify buildings or portfolios that could qualify for green finance. This simplifies the sustainable finance process by helping banks, non-bank lenders and investors to structure sustainable finance transactions using NABERS ratings, as they can be used to demonstrate significant environmental impact. The Criteria has been developed and tested in consultation with the investment community and building owners. Currently, a pilot project is underway, to understand how the Criteria works in practice so that it can be adapted to meet user needs prior to public release.

NABERS Sustainable Finance Criteria is a very good example to follow, as it is based on two methods to demonstrate eligibility, that have some similarity to the technical screening criteria applied to the buildings sector under the EU Taxonomy (whereas focusing on emissions reduction rather than energy performance):

- Method 1 – Building upgrades that will result in a minimum 30% emissions reduction over a maximum 5-year period. Under this method, buildings must target a minimum NABERS star rating of 4 stars or above.
- Method 2 – Low carbon building whereby a building is considered low carbon and eligible if they are performing in the top 15% of a sector at the time of issuance or, in the case of new builds, a property owner/manager signs a NABERS Commitment Agreement to meet or exceed the rating that represents the top 15%.

[20] https://www.eib.org/en/products/advisory-services/elena/index.htm
[21] https://www.nabers.gov.au/publications/pilot-program-nabers-sustainable-finance-criteria

B) **Leases |** Arrangements in which a lessee (the equipment user) pays a lessor (the equipment owner) for the possession and use of an efficiency measure or measures, which include capital leases (ultimately involving a purchase of leased equipment) and operating leases (no purchase is intended at the outset).

Leases for energy or water efficiency weren't identified.

5.2. Specialized Financing Mechanisms

Financing products designed specifically to address barriers to efficiency:

A) **On-bill financing |** Arrangements that let borrowers pay back the cost of efficiency improvements on their utility bill.

Table 4 – On-bill financing examples applied to energy efficiency

Geographical scope	Example	Reference
UK	Green Deal: energy saving for your home	Factsheet #B1
Latvia	Sunshine: Save your bUildiNg by SavINg Energy	Factsheet #B2

Just as energy utilities market efficiency services (examples provided in Table 4), by providing on-bill financing of energy efficient appliances, such as heat pumps and solar panels, also water utilities could explore new business models based on providing products and services related to water-efficiency and WEN.

This could include on-bill financing of water-efficiency audits and subsequent replacement of equipment (such as taps, showers, flushing systems) or any water using appliances (dish washers, heat pumps for central heating or domestic water heating, etc) or even rainwater harvesting systems. On-bill financing provides a secondary business revenue for utilities, and a reduced up-front cost approach for small retrofits or for equipment replacement for consumers.

B) **On-tax financing |** Arrangements that enable participants to pay back clean energy investments in a specific tax, e.g. property tax, through a special assessment (applied by their municipality or other tax collector). Example: Property Assessed Clean Energy (PACE) financing mechanism at a Federal level in the USA.

Table 5 - On-tax financing examples applied to energy and water efficiency

Geographical scope	Example	Reference
USA	PACE – Property Assessed Clean Energy	Factsheet #B3

In Europe, on-tax financing for energy and/or water efficiency has not been used, to the best of our knowledge. The best example is the United States of America federal mechanism PACE (Property Assessed Clean Energy), which finances improvements on private properties (Table 5). PACE is a tax-assessment based financing mechanism for energy efficiency, renewable energy, and water conservation projects. The PACE financing mechanism is set up by a municipal government by which property owners finance energy efficiency and renewable energy measures via an additional tax on their property. The property owners repay the "assessment" over a period of 15 to 20 years through an increase in their property tax bills.

A recent H2020 financed project (EuroPACE) assessed the fiscal readiness of the EU[22] countries to adopt a system such as PACE, determining that several countries have the legislation and tax instruments in place to adopt such a system.

Such an on-tax system, particularly if associated with property tax and transferrable with property, would allow to overcome several barriers to deep-retrofitting, such as reducing (or eliminating) up-front costs, being available to elderly homeowners (which cannot easily get a traditional loan under good conditions).

Particularly if backed by public investment (in the form of subsidies or risk guarantees), a PACE like system is likely to increase adoption of energy and water-efficiency retrofits in European countries. As an additional benefit, it can foster creation of new business models in the construction sector, which can serve as a more mainstreamed intermediary, reaching wider audiences.

C) Savings- backed Arrangements

- **Energy Savings Performance Contracts (ESPC) |** Arrangements generally offered by Energy Service Companies (ESCOs) that guarantee a pre-determined level of energy savings for the customer and is paid from the associated energy savings. The improvements are usually owned by the customer and may be installed with little or no upfront cost if the ESPC is financed. Typically include designing and arranging financing; installing and maintaining; monitoring savings; Assuming the risk that the project will save the guaranteed amount of energy.

[22] https://www.climatebonds.net/resources/reports/europace-24-feasibility-study-financial-instrument-and-review-existing-retrofit

Table 6 - Energy Savings Performance Contracts (ESPC) examples applied to energy efficiency and WEN

Geographical scope	Example	Reference
National (Croatia)	ESCO – efficiency of pumps in water works	Factsheet #B4
National (Germany)	Financing the energy Renovation of public buildings through internal contracting	Factsheet #B5

With these mechanism homeowners do not need to take on a bank loan (adding to their debt) but pay a monthly service fee consisting of an investment repayment and an energy bill to the ESCO.

ESPCs are recognized as instruments that facilitate procurement of innovative solutions and associated investments by municipalities, with potential also for water efficiency. Although examples provided are solely applied to energy efficiency, ESPCs contracts are being used in Portugal by a water utility to reduce water losses in water distribution networks.

In the United States, Energy Savings Performance Contracting are widely used as a budget-neutral approach to make building improvements that reduce energy and water use and increase operational efficiency. State and local governments can implement ESPC projects in their own facilities, as well as promote and support ESPC projects through ESPC programs.

ESPC mechanism should be explored in other European countries and applied to water efficiency building renovations.

One key element to enable ESPC is to secure a harmonized and consistent approach to measuring and verifying efficiency investments. This is provided by the International Performance Measurement and Verification Protocol (IPMVP®), which provides a framework to 1) verify a project has the potential to perform and save energy, and 2) quantify site-level energy and cost impacts from a targeted project.

Although IPMVP is better known as an ally for ESPCs based solely on energy savings, it can also be applied to demand, water consumption, related cost savings, emission reductions, or any other quantities being measured and verified[23].

[23] https://evo-world.org/en/products-services-mainmenu-en/protocols/ipmvp

- **Energy Service Agreements (ESA) |** Agreements between a customer and the ESA provider who provides financing for the project and delivers energy savings (i.e., megawatt hours) at a negotiated price (less than retail rates for energy services). In this pay-for-performance, off-balance sheet financing, the ESA provider typically owns the equipment for the duration of the contract.

Table 7 - Energy Service Agreements examples applied to energy savings

Geographical scope	Example	Reference
National (Portugal)	Bairro Solar	Factsheet #B6

ESA for WEN or water efficiency weren't identified.

D) Other climate/sustainability bonds according to the ICMA standards |

- **Green bonds and/or Sustainable bonds. Green bonds** enable capital-raising and investment for new and existing projects with environmental benefits. They are a fixed-income instrument that is specifically earmarked to raise money for climate and environmental projects. These bonds are typically asset-linked and backed by the issuing entity's balance sheet, so they usually carry the same credit rating as their issuers' other debt obligations. **Sustainability bonds** are bonds where the proceeds will be exclusively applied to finance or re-finance a combination of both green and social projects.

Table 8 - Green bonds example applied to energy efficiency and water management

Geographical scope	Example	Reference
National (Finland)	MiniFin Green bonds	Factsheet #B7

MuniFin (Municipality Finance Plc) is an active Finnish bond issuer in international capital markets and the first Finnish green and social bond issuer. Green finance is offered to selected projects that promote the transition to low-carbon and climate resilient growth in 4 categories: buildings, transportation, renewable energy and water and wastewater management that seek to mitigate or adapt to climate change. On 11 January 2023, MuniFin kick-started the funding year by pricing a 5-year EUR 1.5 billion benchmark. This year, MuniFin plans to issue EUR 8-9 billion of long-term funding, which is in line with the new issuance volumes in 2022.

5.3. Other

A) **Subsidies |** A subsidy is a benefit given to an individual, business, or institution, usually by the government. It can be direct (such as cash payments) or indirect (such as tax breaks).

Table 9 - Subsidies examples applied to energy and water efficiency

Geographical scope	Example	Reference
National (Greece/CRES)	PROGRAM SAVING AT HOME II	Factsheet #C1
National (Finland)	Subsidies for energy efficiency improvements of residential buildings	Factsheet #C2
National (Finland)	Energy aid for municipalities and companies	Factsheet #C3
National (Finland)	Tax credit for household expensive	Factsheet #C4
National (Malta/EWA)	Energy and Water Efficiency Scheme for Voluntary Organisations	Factsheet #C5
National (Malta/EWA)	Energy Audits for SMEs	Factsheet #C6
National (Italy)	Superbonus 110%	Factsheet #C7
National (Portugal/ADENE)	Fundo Ambiental – PAE+S (*Environmental Fund – Sustainable Buildings Support Program*)	Factsheet #C8
National (Portugal)	BundleUPNEXT	Factsheet #C9

The example provided by Portugal is a financial support mechanism for energy building renovation and improvement, including water efficiency renovation, provided by a dedicated funding programme from the Portuguese Environmental Fund (Fundo Ambiental), targeted at energy, water and resource efficiency in households, commercial and public buildings. The programme has been a huge success, with great adherence and implementation rates by homeowners, commercial and public property owners/managers. This support program allows for energy efficiency retrofits through the installation of more efficient systems (passive and active) supporting the execution of EPC's. It also allows water efficiency building renovation through the installation of more efficient equipment (provided they are duly labeled according to a Portuguese national rating for products). For commercial buildings, supports auditing and identification of potential improvement measures through AQUA+ Water Rating for Buildings, a rating system developed by the Portuguese Energy Agency ADENE (see section 4.2.3.). This financial support scheme targets the entire scope of improvements of a building's efficiency, thus guaranteeing integrated water-energy nexus improvements.

B) **Blended finance mechanisms** | involves the strategic use of development financing for the mobilisation of additional finance towards sustainable development, mostly in developing countries, addressing unfavourable risk-return profiles of investment. This approach attracts commercial capital towards projects that contribute to sustainable development, while providing financial returns to investors, helping to broaden the total amount of resources available to developing countries, complementing their own investments to fill their SDG financing gap, and support the implementation of the Paris Agreement. Although some grants and subsidies included in this study may be considered blended finance, the instruments considered as blended finance are usually linked to larger scale investments. As this study is focusing on built environment and smaller investment levels, blended finance examples weren't included.

6. ENERGY AGENCIES' VIEW (SURVEY RESULTS)

All EnR agencies, partners, and stakeholders were invited to participate in a survey to gather information on existing solutions for smart and efficient financing. Ten agencies manifested their willingness to participate and answer the questionnaire to identify examples and case studies, and provide information on needs, experiences, and barriers. Despite this initial availability, 4 full answers were received (ADENE, Portugal; EWA, Malta; CRES, Greece; MOTIVA, Finland) with global information provided by EST, United Kingdom. This reflects a lesser priority currently given to the topics (both WEN and/or financing), and/or a lack of compiled data regarding mechanisms which might be available at a national energy agency level. For instance, the Energy Saving Trust (United Kingdom) provided general country information but given the agency's indirect involvement in the topic, did not provide individual answers to the survey. During the survey analysis it was possible to gain some insights about the organizations' roles, the funding mechanisms used in the addressed countries, EnR Agency's role, barriers and solutions for each type of mechanism.

6.1. Energy Agencies' Role

- Organizations' overall role

All the responding agencies have activities concerning the water-energy nexus (WEN). The Water Efficiency audits and certifications are offered by all, except CRES (Greece). In Malta, besides The Energy and Water Agency (EWA), there are no other organizations working in WEN.

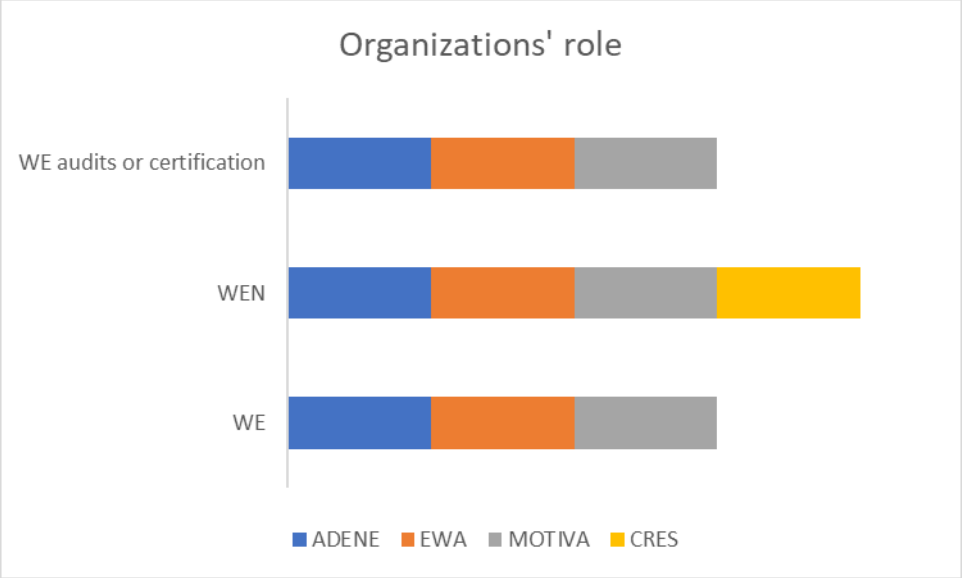


Figure 4 – Organization's role

- Organizations' role in project financing

When it comes to project financing, all 4 responding agencies work on post-financing monitoring, but only ADENE, CRES and EWA work on policy design and tech specifications. None of the agencies deal with the financing assessment phases.

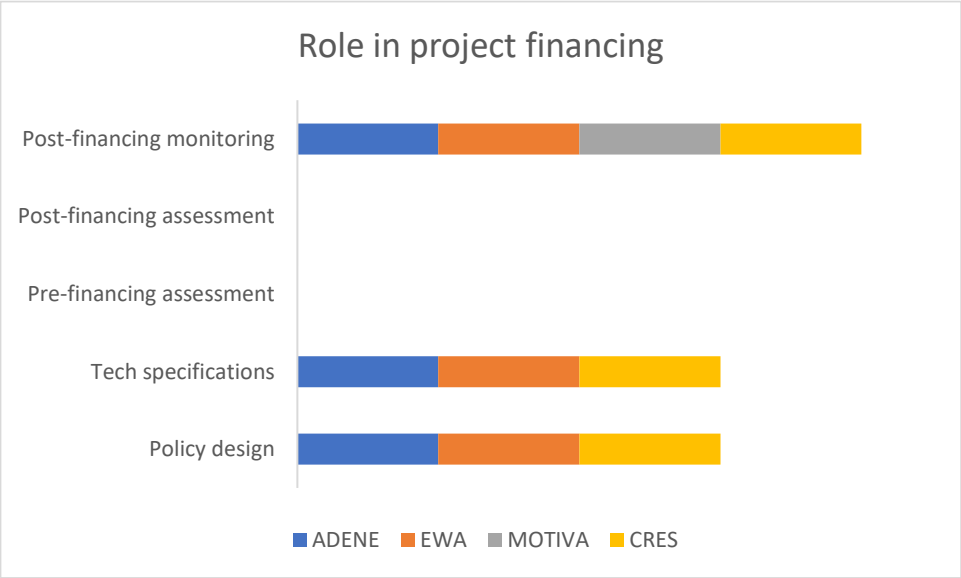


Figure 5 - Agencies role in the financing projects

6.2. Funding and financing mechanisms

To determine the common types of funding and financing mechanisms, according to each category (Energy Efficiency EE, Water Efficiency WE, Water-Energy Nexus WEN), we gathered the information obtained from the questionnaire.

Loans and Green Loans are the most used and preferred mechanisms for all categories in these four countries. Service contracts and subsidies are also referred for EE and WEN, but not for WE.

Other instruments such as cash grant and tax credits were also mentioned for EE and WE but have little impact. Meanwhile, no category (EE, WE, and WEN) is currently covered by leases and climate bonds.

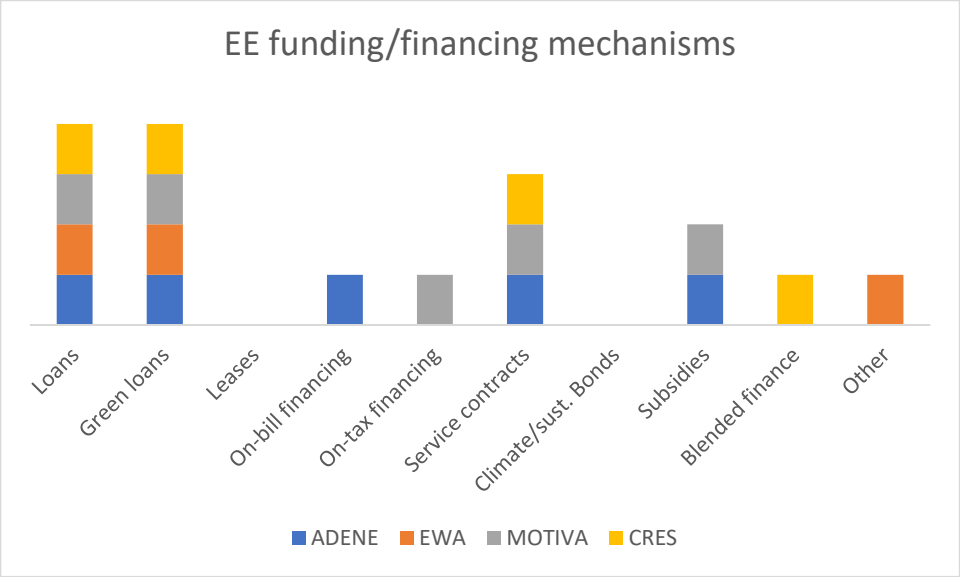


Figure 6 - Energy Efficiency mechanisms

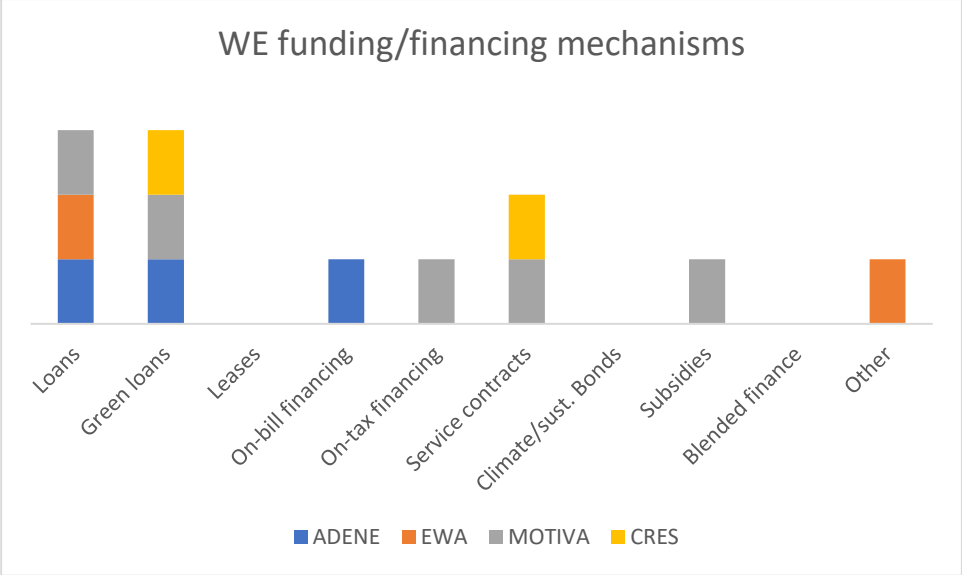


Figure 7 - Water Efficiency mechanisms

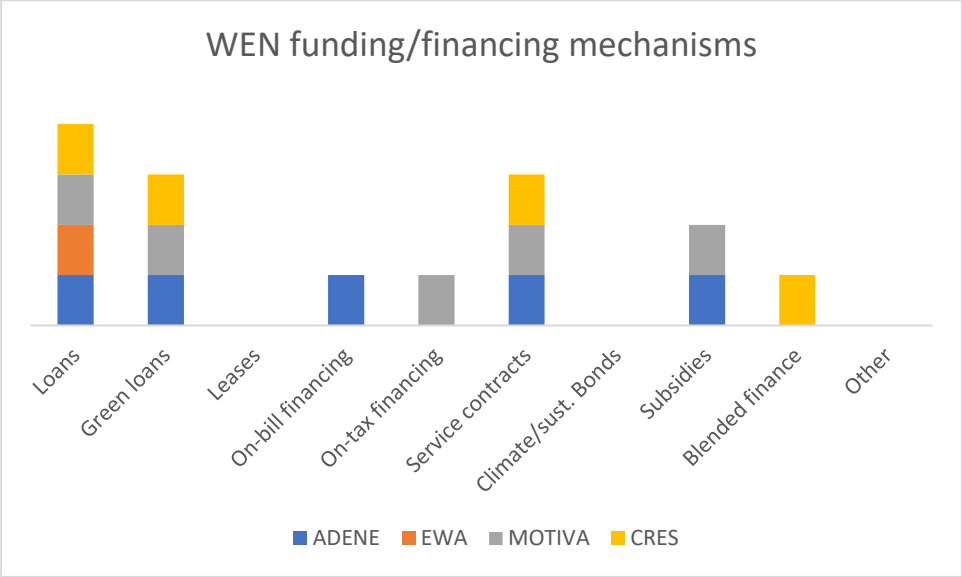


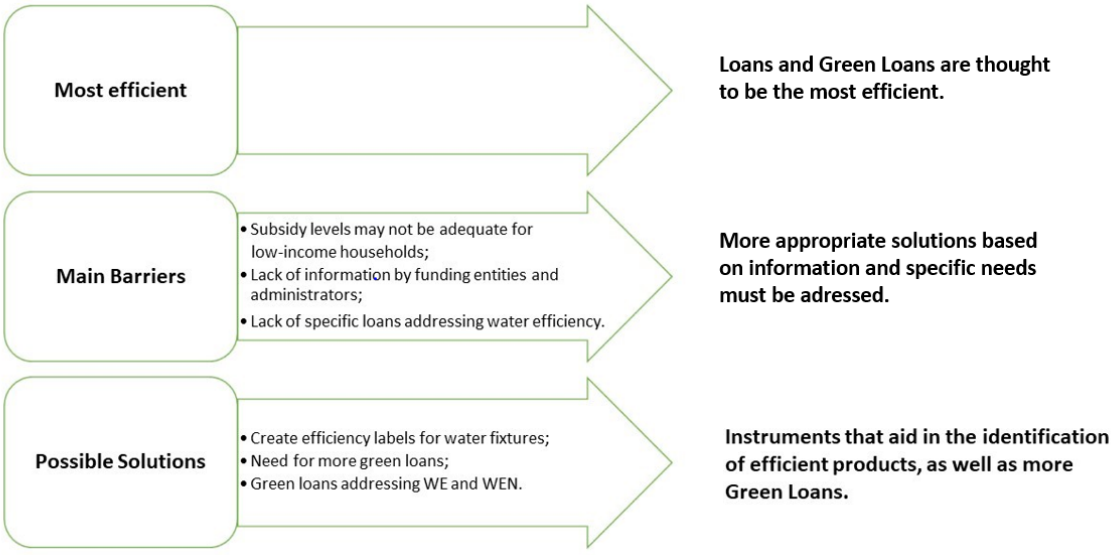
Figure 8 - Water Energy Nexus mechanisms

6.3. Barriers and Solutions

All the previously mentioned mechanisms have their own set of barriers that prevent them from achieving their full potential as levers for the ecological transition. To facilitate the identification of these obstacles and the appropriate solutions, the information is divided in two types of mechanisms: financing and public funding.

1) Financing mechanisms (loans, green loans, leases, bonds, etc)

Figure 9 – Barriers and solutions to financing machanisms

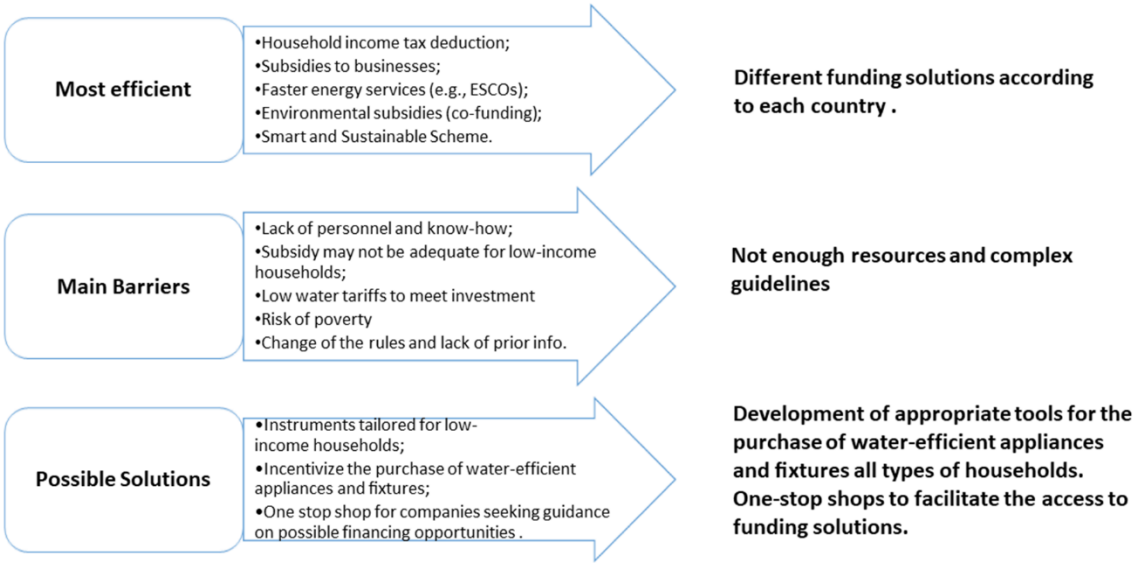


When it comes to financing mechanisms, one finding from the survey is the perception that Loans and Green loans have a greater impact and acceptance in promoting the decarbonization, than the remaining mechanisms. Nonetheless, this type of mechanisms has some issues that are worth mentioning, namely the operationalization of adequate programmes adjusted to the different incomes and needs (included WE and WEN measures).

To overcome these barriers, there is the need to inform funding financing entities about market dynamics and particular problems that must be addressed in these loans, which might result in a helpful mechanisms' adaptation.

- Public funding mechanisms (grants and subsidies)

Figure 10 - Barriers and solutions to public funding



In terms of grants and subsidies, the diversity of these types of mechanisms for each country is a major factor in maintaining a high level of efficiency. However, it is clear from the responses that these types of mechanisms have room for improvement because, in many cases, there is a lack of information and limited human resources with technical knowledge. Furthermore, the complexity of guidelines and constant change of rules prevent these mechanisms from scaling-up. Possible solutions were identified, eg. the development of instruments that certify the efficiency of solutions (water and energy efficiency), and one-stop shop that aggregates all information, facilitating access to services and products.

Additionally, according to the Energy Efficiency Financial Institutions Group (EEIFG)[24] there is a far greater supply of finance, and investment funds, looking to invest in sustainable projects, including energy efficiency, than there are projects to be financed. EEIFG identified significant financial barriers to the development of water and energy efficiency investments: 1) high investment costs (capital intensive solutions with longer pay-backs); high transaction costs (smaller investments when compared with competing projects); and poorly known risk characteristics and difficult access to finance from some market sectors (low-income households and SMEs). The limited availability of reliable information and real water and energy efficiency performance data is also a growing issue for financial institutions, that might too be facilitated by water and energy performance certificates and by one-stop-shops.

[24] EEFIG - Energy Efficiency Financial Institutions Group: The evolution of financing practices for energy efficiency in buildings, SME's and in industry, Final report. Brussels (2021)

7. CONCLUSIONS AND GUIDELINES FOR ENERGY AGENCIES

7.1. Benchmark analysis on identified solutions and examples

In current geopolitical context, the conditions are in place to accelerate policy ambition and investments in decarbonization. The Recovery and Resilience national plans, reinforced by the RePowerEU plan, include a minimum of 30% of climate-relevant expenditure and contain a building renovation flagship priority. The EU Taxonomy and pressure by investors and financiers on large and listed companies are other strong drivers for investment in energy transition, actively preventing non-Paris aligned investments that would harm EU's Green Deal targets. Nevertheless, energy efficiency investments in buildings are significantly below the levels required to deliver the EU's increased climate ambition and identified in the Renovation Wave. An additional EUR 275 billion per year in renovation investments over the period 2021-2030 was identified in the Renovation Wave Strategy[25] as a condition to reach EU energy and climate objectives by 2030.

Water efficiency and water-energy nexus goals lag behind energy efficiency investments. However, water efficiency and combined water-energy savings leads to significant primary energy reduction. So, the time is now to seize WEN opportunities alongside the needed investments for energy efficiency and the transition to a more sustainable financing framework, where sustainable use and protection of water and marine resources are one of the six environmental objectives to be fulfilled under the EU Taxonomy and the EU sustainable finance framework.

Some conclusions arising from the benchmark developed in this study are synthetized bellow:

1) Traditional financing mechanisms:

- Identified **'Green loans'**, although targeting specifically energy efficiency (and indirectly water efficiency, e.g. heat pumps), could easily be adapted to also cover water efficiency, provided that a certification could be used to assess eligibility (as it happens with EPC for energy efficiency loans). This has great potential in countries like Portugal, where a water efficiency certification is already in place for domestic buildings, hotels and soon available for commercial buildings.
- Considering **'Green or Sustainability linked loans'**, Elena is a good European example, but it doesn't target individual homeowners due to the minimum investment limit, although it encourages local government, financial institutions, national governments or any public corporations to bundle projects to reach this minimum threshold. A good example targeted at homeowners and property owners, is NABERS Sustainable Finance Criteria, in Australia, which helps borrowers and lenders by demonstrating eligibility and respective environmental impact arising from several certifications and improvements, including on water efficiency.

[25] https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_1836

2) **Specialized Financing Mechanisms** (designed specifically to address barriers to efficiency)

- **'On-bill financing'** has great potential to help transition existing buildings to water and energy efficiency. Water utilities could explore new business models based on providing products and services related to water-efficiency and water-energy nexus through on-bill financing of water-efficiency audits and subsequent replacement of equipment (such as taps, showers, flushing systems) or any water using appliances (dish washers, heat pumps for central heating or domestic water heating, etc). On-bill financing could provide a secondary business revenue for utilities, and a reduced up-front cost approach for small retrofits or for equipment replacement for consumers.
- An **'on-tax'** system like PACE, particularly if associated with property tax and transferrable with property, would likely increase the adoption of energy and water-efficiency retrofits in European countries. As an additional benefit, it would foster the creation of new business models in the construction sector, which can serve as a more mainstreamed intermediary, reaching wider audiences.
- **'Savings-backed Arrangements'**, particularly **'Energy performance contracts (EPC)'** operated by Energy Service Companies (ESCO) facilitate procurement of innovative solutions and associated investments by municipalities. They have strong potential to be applied to water efficiency building renovations, backed by the fact that a key tool to EPC success (the International Performance Measurement and Verification Protocol), can also be applied to water consumption, related cost savings, emission reductions, or any other quantities being measured and verified.
- A good **'Green bond'** example is found in Finland, a green bond issued by MuniFin (Municipality Finance Plc), one of Finland's largest credit institutions and a national bond issuer promoting sustainable projects. It should be replicated in other European countries.

3) **Specialized Financing Mechanisms**

- Lastly, but not the least, **'Subsidies'** are the financing mechanisms with more examples identified by European Energy Agencies. Two provided examples, in Malta and Portugal, address water efficiency alongside energy efficiency. The identified financial support mechanisms in Portugal for energy and water efficiency renovation and building improvements were implemented with success and could be replicated in other countries. This example builds on primary energy reduction goals, to which water efficiency solutions must contribute, translating water savings into energy savings and CO_2 emission reduction. Although it fosters the water-energy nexus, it doesn't allow for single water efficiency applications, even if they lead to significant energy reduction. This limitation might be a topic to address in future similar programmes, to foster water efficiency investments even where energy investments are no longer needed.

7.2. Recommendations and guidelines for Energy Agencies

The EU public water sector represents 2,6% of the total EU electricity consumption[26]. Water heating accounts for c.a. 25% of energy use in the domestic sector[27]. For every litter of water delivered within the urban water cycle, there is a significant direct and indirect use of energy. In Portugal, estimates show that reduction in water demand in buildings can lead to savings of ca. 20% of total energy use by these utilities in Continental Portugal, through water efficiency in domestic buildings alone[28].

On the other end, water availability is among the key constraints affecting the European energy sector, which may be particularly vulnerable to water scarcity. Water availability plays an essential role on European Energy independence and security, and particularly on its way to climate neutrality by 2050[29], as water is a key resource for renewable energy production, from hydropower to solar, nuclear or green hydrogen production).

Thus, water efficiency and WEN are key contributors to reach EU decarbonization targets and financing mechanisms are cornerstone to achieve much needed water and energy savings through WEN improvement measures in buildings and cities.

Energy Agencies can help to create, adopt, or adapt new or existing financing mechanisms as presented in previous sections. The following recommendations aim for that goal:

- EnR agencies should expand their scope of action to water efficiency and WEN, as well as to aid or advocate for financing mechanisms towards WEN, including its reinforcement in European policies where water efficiency and WEN are lacking (eg. EPBD, EU Renovation Wave and overall LTRS, EU Industrial Strategy). EnR Agencies are in a central position to play a decisive role in ensuring adequate policies and actions towards effective implementation of the smart financing mechanisms required to facilitate investments at European, national, and local levels.
- EnR Agencies have been traditionally involved in the creation and implementation of innovative actions in the areas of the environment and energy, through the dissemination of good practices, project development, studies and advisory actions, training, information, and consultancy services improving market literacy. They can provide technical assistance to citizens, local and national authorities, banks, and financial intermediaries confirming investment eligibility and their water and/or energy efficiency improvements, aligning with the EU Taxonomy and monitoring efficiency gains.

[26] Magagna, D. et al: Water-Energy Nexus in Europe. JRC Science for policy report. (2019)
[27] ADENE – Portuguese Energy Agency, according to the Portuguese Energy Performance Certificate
[28] Faia, V, Newton, F, Malta Dias, P.: Water-Energy Nexus: Contribution ff Water Efficiency in Buildings to Primary Energy Savings. Oral communication accepted for CEES 2023 – The second International Conference on Construction, Energy, Environment and Sustainability (2023)
[29] Magagna, D. et al: Water-Energy Nexus in Europe. JRC Science for policy report. (2019)

- Additionally, Agencies can manage and/or support product labelling (nationally and/or at a European level – see EnR Report "Energy & Water Labelling for the taps and showers market"[30]) and building efficiency ratings and certification schemes, which are key enablers of the sustainable finance transition, as they rate or reward relative compliance or performance levels with specific environmental goals and requirements.
- They can help in the design and/or requirements definition for financing mechanisms, as well as to a greater integration of different evaluation models (energy and water) and information on respective key data (eg, EPC data needed for EU taxonomy reports according to technical screening criteria for economic activities in the buildings sector), to inform on properties baseline and provide final evaluation under the same criteria.
- EnR Agencies could also promote training, reskilling, and upskilling for the construction and cities workforce, to allow for better response to needed technical and financial evaluations (see EnR Report on "Green Jobs & Skills"[31], 2022).
- EnR could also promote technical and project development assistance facilities, like one-stop-shops, to support building owners and local authorities improve the energy and water efficiency of their buildings, facilitating market entry of water and energy efficient technologies and of funding and financing mechanisms to implement them.
- Adding up to financing mechanisms, it is also important to address and promote non financing smart incentives (eg. tax benefits), that can reward and thus motivate own investments from private companies and real estate developers aligned with water efficiency and water-energy nexus that benefit future property owners and cities. EnR agencies might have a role in this topic as well.
- Lastly, dissemination of financing mechanisms is key, including by EnR agencies, as well as the development of tools and observatories to monitor their evolution and adoption, which can in turn support public policies design, improvement, and practice. They too can be developed, promoted or receive inputs and data from European Energy Agencies.

[30] https://enr-network.org/energy-water-labelling-for-the-taps-and-showers-market-contribution-for-increased-adoption-of-efficient-water-use-products-fixtures-and-appliances/
[31] https://enr-network.org/publications/green-jobs-skills-challenges-and-opportunities-for-energy-agencies/

8. **Annex** – Funding and financing mechanism / project / initiative fact sheets

In this annex, factsheets describing case studies of funding and financing mechanisms related to water-energy efficiency, provided by EnR Agencies (identified as such), or gathered in the literature review, are presented in full, for future reference.

8.1. Traditional Financing Mechanisms (Loans and Leases)

FACTSHEET #A1	**APS Green Finance** (information provided by EWA)
Short description and URL	APS Green Finance is a lending product that enables bank customers, both personal and commercial, to finance their transition towards a more energy efficient and sustainable future. Green Finance Loan of €25,000 at a variable borrowing interest rate of 2.50% p.a. for the first 10 years, followed by a 2.05% p.a. variable interest rate for the remaining 5 years, the Annual Percentage Rate of Charge (APRC) will be 2.48% p.a. https://www.apsbank.com.mt/green-finance/
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Water efficiency, Energy efficiency, Water-energy nexus
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Private
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	property owner, tenant, building management service company, real estate developer
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Loans, Green Loans
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	Yes. Green home loan dependent on a valid and low scoring Energy Performance Certificate (EPC) rating. Eco loans for Class 'A' white goods.
What **type of technologies and/or measures** are financed?	Electric vehicles, PV panels, Green roof gardens, Solar water collectors, Space heating, Efficient lighting systems, Hot water or cooling generation, Building and energy management systems, Interior and exterior apertures (double glazing and insulation)
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	-
What were the **main success factors** in implementation?	The main benefits offered through this product are available to us through the EU funding, APS customers will benefit from favourable and reduced collateral requirements due to the presence of an EIF guarantee tied to each facility, as well as an interest rate subsidy, paid directly by EIF. This subsidy covers the full interest rate that is applied to the loan, rendering it essentially interest free for up to 10 years.
What are the **main barriers** identified for its implementation?	-
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	Longer loan repayment terms; Apply to all types of buildings
Other relevant information, contacts, links, etc.	

FACTSHEET #A2	**UCI Soluções Vive Green** *UCI Live Green Solutions* (literature review)
Short description and URL	https://www.uci.pt/vive-green/solucoes-vive-green-1030/
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Private
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	property owner, real estate developer
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Loans, Green Loans
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy)?	Yes
What **type of technologies and/or measures** are financed?	Acquisition of more efficient houses and energy rehabilitation of housing
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	Houses acquisition with EPC classes A+ and A and with 30% improvement energy in rehabilitation
What were the **main success factors** in implementation?	-
What are the **main barriers** identified for its implementation?	-
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	

FACTSHEET #A3	**CGD - Vantagem Imóveis Energeticamente Eficientes** *CGD – Energy Efficient Real Estate Advantage* (literature review)
Short description and URL	https://www.cgd.pt/Particulares/Em-Campanha/Pages/Vantagem-Imoveis-Energeticamente-Eficientes.aspx
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency,
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Private
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	property owner, real estate developer
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Loans, Green Loans
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	Yes
What **type of technologies and/or measures** are financed?	Acquisition of more efficient houses
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	Houses acquisition with EPC classes A+, A and B
What were the **main success factors** in implementation?	-
What are the **main barriers** identified for its implementation?	-
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	

FACTSHEET #A4	**ELENA, the European Local Energy Assistance facility** (literature review)
Short description and URL	The European Local Energy Assistance facility is run by the European Investment Bank on behalf of the European Commission. It helps the public and private sector implement energy efficiency, renewable energy and sustainable transport Investment projects, thus reducing greenhouse gas emissions. The ELENA facility promotes innovative solutions in energy efficiency and accelerates investments by building experience, facilitating financing and overcoming barriers. (https://www.eib.org/en/products/advisory-services/elena/index.htm)
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency; Sustainable residential; Urban transport and mobility
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Local public authorities and private entities
Type of instrument (*e.g.* Loans, Green Loans, Leases, Onbill financing, Ontax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Loans
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	-
What **type of technologies and/or measures** are financed?	ELENA supports the preparation of projects that improve energy efficiency and renewable energy use in buildings.; sustainable residential - We help private individuals and homeowner associations prepare and implement energy efficiency renovations and renewable energy projects for residential buildings.
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	-
What were the **main success factors** in implementation?	ELENA closes a gap in project development activity left by national and regional support programmes knowledge sharing between different stakeholders
What are the **main barriers** identified for its implementation?	• insufficient resources for identification and preparation of investment projects • insufficient skills and know-how of stakeholders • cost-benefit ratio of energy efficiency and renewable energy sources perceived as unattractive • restricted access to financing sources • conflicting goals at institutions and stakeholders
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	ELENA is a joint initiative by the European Investment Bank and the European Commission under the Horizon 2020 programme. A team of experts, consisting of engineers and economists with extensive experience in the energy and transport sectors, lead the ELENA facility. Established in 2009, the ELENA facility has awarded more than €180 million of EU support, mobilising an estimated investment of around €6.6 billion (as of end 2019).

FACTSHEET #A5	**NABERS Sustainable Finance Criteria** (literature review)
Short description and URL	NABERS is a simple, reliable sustainability rating for the built environment. Like the efficiency star ratings that you get on your fridge or washing machine, NABERS provides a rating from one to six stars for buildings efficiency across: Energy; Water; Waste; and Indoor environment. This helps building owners to understand their building's performance versus other similar buildings, providing a benchmark for progress. NABERS Sustainable Finance Criteria has been launched to set consistent NABERS-based targets to help borrowers and lenders demonstrate eligibility. It has been developed and piloted in consultation with the investment community and building owners. https://www.nabers.gov.au/
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	WE, EE, WEN and others
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public - NABERS is a national government program administered by the NSW Government (the National Administrator).
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	-
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Loans
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	-
What **type of technologies and/or measures** are financed?	The New South Wales government will provide a financial contribution of up to a total value of $3,000 AUD ex GST towards energy ratings and an action plan. The Water Starters offer, funded by DPE Water, is an additional contribution of $1,000 AUD ex GST towards NABERS Water ratings. This total contribution of $4,000 per building can be used towards administration and Assessor fees in specific sectors (see 'Conditions of offer' for more details), to support customers to get their first rating, action plan, and second rating.
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	-
What were the **main success factors** in implementation?	NABERS ratings form the basis of a robust sustainability strategy. They provide a fair benchmark for a building's energy and water efficiency, enabling comparison across the industry. NABERS ratings are valid for twelve months. This annual model helps ensure that your rating represents a building or workplace's current operational performance. NABERS has partnered with Climate Active to provide a Carbon Neutral certification. A NABERS rating helps building owners to accurately measure and communicate the environmental performance and progress of buildings. It also identifies areas for savings and improvements.
What are the **main barriers** identified for its implementation?	--
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	NABERS is currently expanding into two sectors in 2022-2024. Schools: NABERS ratings will enable schools to understand their energy and water performance, and identify areas for cost savings and improvements, all while creating better, healthier learning environments for schools. Retail stores: NABERS ratings for retail stores will quantify a site's energy and water performance. A NABERS rating can then identify areas for cost savings and improvements and promote the retail store's environmental credentials.
Other relevant information, contacts, links, etc.	-

8.2. Specialized Financing Mechanisms (on-bill, on-tax, savings-backed arrangements, bonds)

FACTSHEET #B1	**Green Deal: energy saving for your home** (literature review)
Short description and URL	The Green Deal helps make energy-saving improvements to home and to find the best way to pay for them https://www.gov.uk/green-deal-energy-saving-measures
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Private
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Single-family houses
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	On-bill financing
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	Yes, when moving into a property with a Green Deal, the landlord or seller must show a copy of the Energy Performance Certificate (EPC).
What **type of technologies and/or measures** are financed?	**4)** replacing windows and doors **5)** installing secondary glazing **6)** using energy efficient lighting **7)** insulating your loft or walls **8)** adding draught proofing **9)** upgrading your heating **10)** generating renewable energy from sources such as wind or solar power
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	Yes, by presenting the EPC this will explain what improvements have been made and how much still need to repay.
What were the **main success factors** in implementation?	-
What are the **main barriers** identified for its implementation?	-
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	-

FACTSHEET #B2	**Sunshine: Save your bUildiNg by SavINg Energy** (literature review)
Short description and URL	The Building Energy Efficiency Facilities – the BEEFs – are funds created and managed by F3 to facilitate long-term investments necessary for multifamily building and public building renovation projects. Offer a comprehensive financing model that responds to the needs of all 3 main stakeholders in building renovation service journey: the residents, the Service Providers, and the Investors. https://sunshineplatform.eu/https://www.gov.uk/green-deal-energy-saving-measures
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Building renovation
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Private
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Single-family houses
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	On-bill financing
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	Yes, when moving into a property with a BEEF, the landlord or seller must show a copy of the Energy Performance Certificate (EPC).
What **type of technologies and/or measures** are financed?	**11)** Building fabric **12)** Heating system **13)** Domestic hot water system **14)** Ventilation system
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	Yes, by presenting the EPC this will explain what improvements have been made and how much still need to repay.
What were the **main success factors** in implementation?	-
What are the **main barriers** identified for its implementation?	-
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	-

FACTSHEET #B3	**PACE - Property Assessed Clean Energy- (**literature review)
Short description and URL	United States of America Federal long term loan scheme for energy and water efficiency retrofits in the residential sector, paid on-tax, associated with the property tax. The loan is transferable w/ property, which allows for longer term loans and payment by future owners/beneficiaries if house is sold; The mechanism is available at a federal level, but with some state-level changes, namely subsidies, 0% interest loans and other benefits. https://www.pacenation.org/
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Water efficiency, Energy efficiency, Water-energy nexus
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	US Federal mechanism/State level adaptation/Private companies implement for residential
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Property owners
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	On-tax financing (property tax)
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	-
What **type of technologies and/or measures** are financed?	All energy and water efficiency retrofits
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	Yes
What were the **main success factors** in implementation?	Many disseminating agents (building contractors) economically interested and willing to approach property owners. Up to 100% financing, with no out-of-pocket costs or personal guarantee, and personalized support to make your project a success. Long-term financing that is competitively priced, fully amortized, and repaid through assessments that cannot accelerate. Secured by a benefit assessment lien which automatically transfers to the new owner upon sale of the property, improving liquidity. Turns an expense into an investment, often generating immediate cashflows, increasing the market appeal of a property, and accelerating progress toward business and environmental goals. Large number of potential dwellings reached in less time than with one-stop-shop models.
What are the **main barriers** identified for its implementation?	Difficult to assess/oversee Potential for corruption due to large number of actors involved and difficult monitoring
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	Monitoring by local authorities, local and regional energy agencies.
Other relevant information, contacts, links, etc.	https://www.pacenation.org/case-studies/

FACTSHEET #B4	**ESCO - efficiency of pumps in water works (information provided by EIHP)**
Short description and URL	Energy Service Companies (ESCOs) essentially are energy consultants or equipment suppliers that can finance or assist in arranging financing for the operation of an energy system by providing a savings guarantee. Energy efficiency projects according to the ESCO model bring direct financial benefits, contribute to increasing competitiveness in industry, testify to care for the environment and socially responsible business. Projects implemented according to the ESCO model may include: • measures on electricity supply systems and use of RES • measures on heat supply systems and RES • thermal insulation measures of the building envelope)
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy and water-energy nexus
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public-private mechanism (responsible entity: Energy Institute Hrvoje Požar)
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Public buildings
Type of instrument (*e.g.* Loans, Green Loans, Leases, Onbill financing, Ontax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Service contracts ESCO
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	**The Act on Efficient Utilization of Energy in Final Consumption (OG 152/08, 55/12) was adopted, based on:** • EU Directives (2010/31/EU) on the energy performance of buildings (EPBD) • EU Directive (2006/32/EC) on energy end use efficiency and energy services (ESD) • Defines energy services (energy audits and energy certification of buildings) and obligations of the public sector, energy companies and large consumers
What **type of technologies and/or measures** are financed?	Energy-efficiency projects and renewable energy projects. Examples: • Solar power plants • Public Lighting • Lighting • Industry • Buildings • Energy Supply Systems • ZelEn completed projects
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	With the target of 2,166 public buildings the estimate points to 400 public buildings (energy savings: 0.54 PJ per year; CO2 emission reduction: 40.5 kt). One of the results are the implementation of energy management information system (tool for monitoring and management of energy and water consumption in public buildings) - Current specific results (March 2013): 85 buildings in the process (19.7 mill. EUR): • Ready for tendering: 17 buildings • In tendering process: 22 buildings (4.9 mill. EUR) • Reviewing process: 7 buildings • Without interest of energy service providers: 2 buildings • Waiting of approval: 25 buildings (5.8 mill. EUR) • Ready for contracting: 7 buildings (1.4 mill. EUR) • Contracted (energy performance contracts): 5 buildings (1.8 mill. EUR)

FACTSHEET #B4	ESCO - efficiency of pumps in water works (information provided by EIHP)
What were the **main success factors** in implementation?	• Reduction of total energy costs by 30-60%, for every reconstructed building • Implementation of energy efficiency measures and renewable energy sources in buildings • Implementation of advanced methods of energy consumption measuring, via information system for continuous monitoring of energy and water consumption • Contribution to achieving sustainable development goals (GHG and other pollutant emission reduction) • Local economic development by creating new jobs
What are the **main barriers** identified for its implementation?	**Lack of well-prepared projects** • The database of public buildings is incomplete **Problems with property rights and ownership issues with public buildings** **Insufficient number of energy service providers (current situation is better than situation 1 year before)** • Problem: energy service providers must ensure energy saving guarantees • Energy service providers don't like to take over the risks for behaviour of consumers **Financing of the project is on the owner/user of buildings through project financing (establishment of SPV)** • Problem: project financing is not developed in Croatia **Verification of energy savings is not solved**
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	https://www.hep.hr/esco/esco-projects/1833 https://eihp.hr/en/energetska-regulativa-i-ekonomika/

FACTSHEET #B5	Financing the Energy Renovation of public buildings through internal contracting (literature review)
Short description and URL	The city of Stuttgart has developed a 'care-free energy renovation package' for homeowners. The package includes the following services: planning, building and construction, operation and maintenance, financing, guarantee and assumption of risk. The city has established a partnership with the municipal energy utility (acting as an ESCO) which implements and finances the replacement of the heating system. Thus homeowners do not need to take on a bank loan (adding to their debt) but pay a monthly service fee consisting of an investment repayment and an energy bill to the ESCO.
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public - Stuttgart City Council
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Public buildings
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	On-bill financing provided by an ESCO
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	-
What **type of technologies and/or measures** are financed?	Energy efficiency in new buildings and existing buildings
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	-
What were the **main success factors** in implementation?	– A 'care-free energy renovation package' makes energy retrofits easy and attractive for homeowners. Provided homeowners do not change their behaviour, the package does not increase the monthly costs. – Operators increase their ability to implement high quality, ambitious and global energy retrofit programmes, to negotiate with technology suppliers and contractors and to achieve better economies of scale. – Operators can group individual energy retrofit projects and obtain more attractive loans from banks and financing institutions or attract private investors.
What are the **main barriers** identified for its implementation?	Non-financial barriers are more important than the financial one. A market study revealed that financing was not the main barrier to energy retrofits of residential buildings. A set of non-financial barriers has been identified including unclear requirements for energy retrofits, untrustworthy providers (damage to buildings), high costs and lack of profitability, cost-benefit dilemma (owner vs. tenant), large effort vs. overtaxing of the owner, disturbances to residents during the work and difficult decision-making in condominiums.
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	The energy refurbishment rate of Stuttgart's building stock is too low. About 80% of Stuttgart's buildings were constructed before the existence of the first Thermal Insulation Regulation in 1977. Therefore, a very large energy saving potential remains unexploited. In addition to the regulations related to energy efficiency in new buildings there are regulations for the energy refurbishment of existing building stock. In the event of an extensive renovation, the primary energy demand of the renovated building should not exceed by more than 15 % the energy demand of a comparable new building. The state of Baden-Württemberg where Stuttgart is situated adopted additional minimum requirements for heating modernisation in existing buildings. When key components of the heating systems are replaced, heat production has to include 15 % of renewable energy. In 2014, about two thirds of Stuttgart's residential building stock used gas for heating, followed by oil (15%), district heating (11%) and electricity (10%). Only 2% of residential buildings (generally single-family houses) had a heating system based on renewable energy such as biomass, solar energy or geothermal energy. The annual energy refurbishment rate of the residential sector in Stuttgart is stagnating at 1% per year. In multiapartment buildings it is even lower. If the city wants to achieve its energy and climate goals, the rate must increase to 2% by 2020. This means, on a voluntary basis, going beyond the European Energy Efficiency Directive objectives and scope.
Other relevant information, contacts, links, etc. Smart and Sustainable Investment Grant	High quality retrofit work is implemented by the municipal energy utility Stadtwerke Stuttgart (ESCO) and a private company 'Rahm+ ' which is also the general coordinator of the renovation work. The ESCO guarantees the technical building system during the contracting period.

FACTSHEET #B6	**"Bairro Solar" *Solar Neighborhod* (Solar Service Contracts)** (information provided by ADENE)
Short description and URL	EDP Bairro Solar https://www.edp.pt/bairro-solar/
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Private
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	property owner, tenant
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Renewable energy communities (Service contracts ESCO)
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	No
What **type of technologies and/or measures** are financed?	Renewable energy communities
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	Number of members
What were the **main success factors** in implementation?	-
What are the **main barriers** identified for its implementation?	Minimal number of members
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	Reduce number of members
Other relevant information, contacts, links, etc.	

FACTSHEET #B7	**MiniFin Green bonds** (literature review)
Short description and URL	MuniFin has offered green finance for the climate and environmentally friendly projects of its customers since the beginning of 2016. Green finance is offered to selected projects that promote the transition to low-carbon and climate resilient growth. These projects seek to mitigate or adapt to climate change. (https://www.munifin.fi/sustainable-bonds/green-bonds/)
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Buildings, Transportation, Renewable energy, Water and waste water management
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Publicly promoted bonds, private investment (bond buyers)
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Municipalities and the state-subsidised housing sector
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Green bonds
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	Follows the progress of the European Commission's Action Plan on Financing Sustainable Growth, especially the EU Green Bond Standard and the EU Taxonomy for Sustainable Activities
What **type of technologies and/or measures** are financed?	Renovation of existing buildings; Installation, maintenance and repair of energy efficiency equipment; Construction, extension and operation of waste water collection and treatment; Renewal of waste water collection and treatment Renewable energy; Electricity generation using solar photovoltaic technology; Production of heat/cool from bioenergy; Installation, maintenance and repair of renewable energy technologies
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	Sustainable buildings • Annual energy savings (MWh) • Annual CO2 emissions avoided (tCO2) Energy efficiency • Annual energy savings (MWh) • Annual CO2 emissions avoided (tCO2) Renewable energy • Annual CO2 emissions avoided (tCO2) • Annual production of renewable energy (MWh) • Production capacity for renewable energy (MW) Sustainable public transportation • Annual CO2 emissions avoided (tCO2) Water purification and wastewater treatment • Annual amount of treated wastewater (l/m^3)
What were the **main success factors** in implementation?	-
What are the **main barriers** identified for its implementation?	-
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	https://www.munifin.fi/sustainable-bonds/green-bonds/

8.3. Other (subsidies, blended finance, etc.)

FACTSHEET #C1	PROGRAM SAVING AT HOME II (Information provided by CRES)
Short description and URL	The “Saving at Home” program offers significant incentives (up to 70% subsidy) to upgrade energy efficiency and increase the value the citizens’ properties in the entire country, saving money & energy It is repeated as “Save 2021" https://exoikonomisi.ypen.gr/to-programma https://exoikonomo2021.gov.gr/
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency, Water efficicnecy, Water-energy nexus
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public / Structural Funds (Ministry of Environment and Energy)
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Property owner
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Subsidies
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	-
What **type of technologies and/or measures** are financed?	• The upgrading of the heating system (e.g. the installation of a new heating system using natural gas, installation of heat pumps, timers, thermostats, etc) • The installation of alternative sources of hot water supply (e.g. solar water heater) as well as upgrading of the hot water supply system • The installation of smart systems • The external thermal insulation in the shell of the building (concerning the thermal insulation of walls, rooms and floor) • The replacement of frames with new more energy efficient as well as shading systems
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	A prerequisite for joining the program is an energy inspection by an energy inspector, who will issue the required Energy Performance Certificate. Then, the interventions will be selected according to the findings / results of the inspection, in order to achieve the maximum energy savings and the maximum improvement of the energy efficiency of the houses. Following the implementation of the interventions, a second energy inspection will be carried out to check whether the objectives set have been achieved.
What were the **main success factors** in implementation?	Funding is targeted at the final consumer/citizen/owner of a residence or flat
What are the **main barriers** identified for its implementation?	The property should be used as the “main residence” The financial criteria based on the annual revenue of the owner of the residence
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	Nothing special
Other relevant information, contacts, links, etc.	https://exoikonomisi.ypen.gr/to-programma

FACTSHEET #C2	**Subsidies for energy efficiency improvements of residential buildings** (Information provided by Motiva)
Short description and URL	Subsidies for energy efficiency improvements of residential buildings https://www.ara.fi/fi-FI/Lainat_ja_avustukset/Energiaavustus (in Finnish only)
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Principally energy efficiency but can have an impact on water use as well, and particularly on the use of hot water
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Single-family house owners, housing companies, municipal rental housing
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Subsidies
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	Not at the moment
What **type of technologies and/or measures** are financed?	Heating systems (including hot water production), insulation, ventilation, automatin and control, RES List (in Finnish): https://www.ara.fi/fi-FI/Lainat_ja_avustukset/Energiaavustus/Avustettavat_toimenpiteet_ja_avustuksen_laskenta
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	No
What were the **main success factors** in implementation?	-
What are the **main barriers** identified for its implementation?	-
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	-

FACTSHEET #C3	**Energy aid for municipalities and companies** (Information provided by Motiva)
Short description and URL	Energy aid for municipalities and companies: https://www.businessfinland.fi/en/for-finnish-customers/services/funding/energy-aid (in English)
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy audits (water in the scope), energy efficiency investments (e.g. hot water savings)
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Funding from the Ministry of Economic Affairs and Employment. Scheme managed by Business Finland.
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Property owners
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Subsidies
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	Not at the moment
What **type of technologies and/or measures** are financed?	See the list on the website (in English)
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	No. Energy audit reports are submitted to Motiva.
What were the **main success factors** in implementation?	-
What are the **main barriers** identified for its implementation?	-
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	-

FACTSHEET #C4	**Tax credit for household expenses** (Information provided by Motiva)
Short description and URL	Tax credit for household expenses https://www.vero.fi/en/individuals/tax-cards-and-tax-returns/income-and-deductions/Tax-credit-for-household-expenses/ (in English)
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Household renovation works (including water fixtures)
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Single-family houses
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Other: tax credits
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	Not at the moment
What **type of technologies and/or measures** are financed?	No limitations
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	No
What were the **main success factors** in implementation?	-
What are the **main barriers** identified for its implementation?	Available only for labour costs deductions, not cost of goods
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	-

FACTSHEET #C5	**Energy and Water Efficiency Scheme for Voluntary Organisations** (Information provided by EWA)
Short description and URL	Energy and Water Efficiency Scheme for Voluntary Organisations https://energywateragency.gov.mt/voluntary-organisations-scheme/
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency i) The scope of the scheme addressess both energy and water efficiency. ii) The main objective of this Scheme is to support voluntary organisations in reducing their overall energy and water consumption through an increase in energy efficiency, and/or reduction in water use, and/or augmentation of water supply. The assistance is intended to facilitate investment in solutions that contribute directly and tangibly towards these objectives
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public mechanism
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Voluntary Organisations
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Subsidies
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	No, but submission must include report from engineer
What **type of technologies and/or measures** are financed?	Category: Water Efficiency and Supply Augmentation: • Water Flow Reduction • Reservoir Restoration • Secondary Network Category: Energy Efficiency: • Water Heating • Equipment Efficiency • Lighting Efficiency
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	Technical report submitted with application has to confirm savings.
What were the **main success factors** in implementation?	The fact that it was a grant supporting 90% of the cost.
What are the **main barriers** identified for its implementation?	-
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	-

FACTSHEET #C6	**Energy Audits for SMEs** (Information provided by EWA)
Short description and URL	Energy Audits for SMEs https://energywateragency.gov.mt/energy-audits-for-smes/
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency i) The scope of the scheme was also water efficiency; ii) Through this Scheme, qualifying Small and Medium sized Enterprises may benefit from financial support in order to have an energy audit carried out by a certified energy auditor. Through the energy audit, energy and water efficiency improvement opportunities and investments will be identified for these enterprises
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public mechanism
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Small and Medium Enterprises
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Subsidies
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	The Level and Detail of the Audit are set by the Scheme
What **type of technologies and/or measures** are financed?	Energy Audit including Water Consumption Review.
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	NA
What were the **main success factors** in implementation?	The fact that it is a Grant
What are the **main barriers** identified for its implementation?	Scheme Information and knowledge on the benefits of an Energy Audit
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	Media campaigns and stakeholder outreach (already ongoing)
Other relevant information, contacts, links, etc.	-

FACTSHEET #C7	**Superbonus 110%** (literature review)
Short description and URL	The Superbonus is the tax relief governed, which consists of a 110% deduction of the expenses incurred as of 1 July 2020 for the implementation of specific interventions aimed at energy efficiency and static consolidation or reduction of seismic risk of buildings. The facilitated interventions also include the installation of photovoltaic systems and infrastructures for recharging electric vehicles in buildings.
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	All types of buildings
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Subsidies
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	-
What **type of technologies and/or measures** are financed?	• thermal insulation work on enclosures • replacement of winter air-conditioning systems on common parts • replacement of winter air-conditioning systems on single-family buildings or on the building units of functionally independent multi-family buildings • anti-seismic interventions. • Installation of photovoltaic systems • Infrastructure for charging electric vehicles in buildings.
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	-
What were the **main success factors** in implementation?	-
What are the **main barriers** identified for its implementation?	-
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	-
Other relevant information, contacts, links, etc.	https://www.governo.it/it/superbonus https://www.enea.it/it/cittadini/superbonus-sito-enea-detrazioni-fiscali

FACTSHEET #C8	**Fundo Ambiental – PAE+S** *Environmental Fund – Sustainable Buildings Support Program* (information provided by ADENE)
Short description and URL	https://www.fundoambiental.pt/apoios-prr/c13-eficiencia-energetica-em-edificios/01c13-i01-paes-ii.aspx
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Water efficiency, Energy efficiency, Water-energy nexus
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Public
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Property owner
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Subsidies
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	This instrument compliance with efficiency by using the information and requirements from Energy Performance Certification
What **type of technologies and/or measures** are financed?	Replacement of windows, application of thermal insulation, installation of heat pumps, solar thermal systems, biomass boilers and heat exchangers, photovoltaic systems, replacement of water efficiency devices with more efficient ones, installation of intelligent monitoring and control solutions for the water consumption, installation of rainwater harvesting systems and application of bioclimatic architecture solutions.
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	No
What were the **main success factors** in implementation?	Direct targeting to home owners
What are the **main barriers** identified for its implementation?	Some legal breaches by the home owners and service companies
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	The creation of a pre-validation of compliance with the requirements applicable to home owners and service companies
Other relevant information, contacts, links, etc.	

FACTSHEET #C9	**BundleUPNEXT** (literature review by ADENE)
Short description and URL	BundleUPNEXT is an Interreg Europe financed project which created a one-stop-shop for energy efficiency, joining promoters, specialists and investors in a single platform, to try to overcome the difficulty to find financing for small scale project by facilitating its bundling, thus creating a more suitable pipeline for investors or financing institutions. BundleUp NEXT project focuses in three different areas: Technology, by incorporating new types of energy efficiency and electric mobility; Geography, targeting national coverage, allowing beneficiaries from any part of the country; and Sectorial, including, the public sector, the private sector, and a special focus on the social economy. BundleUp NEXT is a One-Stop-Shop for Sustainability that connects investors, developers and specialists who want to participate in energy efficiency project https://www.pontoenergia.pt/
Scope (Water efficiency, Energy efficiency, Water-energy nexus, other resource efficiency)	Energy efficiency
Type of funding/financing and responsible entity (*e.g.* public / private / public-private mechanism)	Private, Public-private
Target (*e.g.* property owner, tenant, building management service company, real estate developer, utility, etc.)	Link Developers-Specialists-Investors
Type of instrument (*e.g.* Loans, Green Loans, Leases, On-bill financing, On-tax financing, Service contracts (Energy Savings Performance Contracts (ESPC), Energy Service Agreements (ESA)), Subsidies, Green bonds, Blended Finance or other)	Service contracts (Energy Savings Performance Contracts (ESPC)
Is the mechanism dependent on **compliance** with efficiency standards, such as classification or certification schemes or progress towards compliance with EU taxonomy?	-
What **type of technologies and/or measures** are financed?	Public lightning, LED private lightning, solar thermal energy, energy efficiency in buildings, energy self-consumption projects and electric mobility
Is there an impact **monitoring** obligation? How? (*e.g.* litters of water saved, CO_2 emissions avoided, number of projects supported, etc.)	-
What were the **main success factors** in implementation?	Various different approaches were used in projects supported by the BundleUP, from direct investment by project owners, to projects pooled in public tenders by a municipality, public funding, loan financing to building owners or ESCOs Creating a scale of Project Maturity Level Project bundling to create a suitable project that can be financed by
What are the **main barriers** identified for its implementation?	Not successful in implementing a crowdlending scheme in the public sector and not able to launch joint tenders by different municipalities to finance bundled projects of the same technology and different geography (even adjacent ones)
What potential **facilitating measures** do you think could be implemented to overcome identified barriers?	Easier to make projects of smaller dimensions financeable Decrease in initial costs associated with public procurement procedures (through collective bidding). Decreased investor risk
Other relevant information, contacts, links, etc.	Interreg Europe project Consortium RNAE, ADENE, SRSAdvogados and GOPARITY and partnership with CITiZEE (https://www.citizee.eu/)