



**bEhaVioral Insights anD Effective eNergy policy acTions**

**Project No. 957117**

**Project acronym: EVIDENT**

**Project title:**

**bEhaVioral Insights anD Effective eNergy policy acTions**

## **Deliverable 5.2**

**Updated impact evaluation plan and policy measures**

**Programme: H2020-LC-SC3-EE-2020-1**

**Start date of project: December 01, 2020**

**Duration: 36 months**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957117



## Document Control Page

Deliverable Name	Updated impact evaluation plan and policy measures
Deliverable Number	D5.2
Work Package	WP5 Policy measures
Associated Task	T5.1 Impact evaluation plan and policy measures
Covered Period	M13 (December 2021) - M39 (February 2024)
Due Date	February 29, 2024
Completion Date	March 5, 2024
Submission Date	March 5, 2024
Deliverable Lead Partner	Joint Research Centre (JRC)
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Version	1.0

Dissemination Level		
PU	Public	X
CO	Confidential to a group specified by the consortium (including the Commission Services)	

## Document History

Version	Date	Change History	Authors	Organisation
0.1	December 13, 2023	Table of contents	Tilemahos Efthimiadis	JRC
0.2	January 09, 2023	Initial version	Tilemahos Efthimiadis	JRC
0.3	February 14, 2023	Updated	Tilemahos Efthimiadis	JRC
0.4	February 18, 2023	Inputs/updates to Sections 4 and 5.	Panagiotis Sarigiannidis, Anna Triantafyllou, Athanasios Liatifis, Fragulis Georgios, Stamatia Bibi, Karagiannidis Georgios, Dritsaki Xaido, Dimitrios Pliatsios	UOWM
0.5	February 23, 2023	Updated	Tilemahos Efthimiadis	JRC
0.6	February 26, 2023	Updated	Tilemahos Efthimiadis	JRC
0.7	March 4, 2023	Revisions	Dimitrios Pliatsios	UOWM

1.0	March 5, 2023	Final revisions	Tilemahos Efthimiadis	JRC
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### Internal Review History

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## Acronyms

Acronym	Explanation
<b>AI</b>	Artificial Intelligence
<b>CORDIS</b>	Community Research and Development Information Service
<b>DD</b>	Double Difference
<b>DX.Y</b>	Deliverable X.Y
<b>EED</b>	Efficient Energy Directive
<b>EU</b>	European Union
<b>GDPR</b>	General Data Protection Regulation
<b>H2020</b>	Horizon 2020
<b>HER</b>	Home Energy Report
<b>HTE</b>	Heterogenous Treatment Effects
<b>IEA</b>	International Energy Agency
<b>ITE</b>	Individual Treatment Effect
<b>IV</b>	Instrumental Variables
<b>KPI</b>	Key Performance Indicator
<b>ML</b>	Machine Learning
<b>Mtoe</b>	million or mega tonnes of oil equivalent
<b>MX</b>	Month X
<b>NECP</b>	National Energy and Climate Plan
<b>RCT</b>	Randomised Control Trial
<b>RE</b>	Randomised Evaluation
<b>SMART</b>	Specific, Measurable, Achievable, Relevant, and Time-bound
<b>WP</b>	Work Package

## Executive Summary

Horizon 2020 project EVIDENT - ‘bEhaVioral Insights and Effective eNergy policy acTions’ provides new insights relevant for energy efficient policy interventions. The project aims to identify and evaluate the heuristics and behavioural biases that impact consumer decision-making regarding energy efficiency by utilizing surveys, serious games, and field trials.

The results of EVIDENT will be used to assess and recommend policy measures for improving energy efficiency, with the goal of reducing energy consumption and promoting the adoption of energy-efficient technologies.

In this deliverable, we provide an overview of the initial findings from EVIDENT and highlight the key insights that are important for policy makers. We note that EVIDENT research activities are still ongoing, so the results presented here are preliminary and may be updated in the future (e.g., in EVIDENT D4.3 – ‘Updated econometric methodologies and robustness’). A separate policy brief will be released once the final analysis is completed, and results and insights will be continuously disseminated through reports, conferences, scientific publications, open-access repositories, and the EVIDENT website.

### First insights from the EVIDENT project:

- Boosting energy efficiency through affordable measures is essential for meeting the objectives of the European Green Deal and comparable initiatives.
- Tackling behavioural shortcomings and information gaps is a cost-efficient and potent approach to enhancing energy efficiency, particularly in the context of residential and commercial consumers.
- The EVIDENT project devises and executes various case studies within the Randomized Control Trials (RCTs) and surveys framework to identify the primary influencers of individuals’ decision-making and to establish connections between energy consumption and other areas, such as financial and environmental literacy
- **Preliminary results** from the EVIDENT project indicate that:
  - Comparison of energy usage through Home Energy Reports (HERs) has been shown to reduce residential consumption and the amount of electricity purchased, compared to those who did not receive such reports.
  - Consumers tend to pay significantly more for their utility bills when received within the first days of their employment salary, indicating a bias towards overspending around the payment day, contrary to the smooth consumption hypothesis.
  - Machine Learning (ML) methodologies can be utilized to create a data-driven framework for forecasting energy consumption and production, providing insights to consumers and prosumers for cost-effective energy planning, and enabling energy providers to manage future energy loads during potential demand peaks.
  - Causal ML models can effectively establish a framework for estimating causal heterogeneity and inferring causal effects in observational and experimental studies, providing insights on the characteristics influencing individuals’ performance in terms of an intervention and how everyone is affected.

Ongoing EVIDENT scientific activities will produce additional findings, particularly from the analysis of the project's serious game, big data analytics, and the examination of how consumers' environmental and financial literacy levels relate to behavioural biases.

#### First high-level recommendations to policy makers:

- Designing and providing tailored **HERs** to residential consumers can lead to a reduction in consumption. Encourage consumer awareness of energy usage and promote energy conservation through consumption feedback and practical advice for more efficient electricity use. HERs can also facilitate compliance with certain requirements of the recast Energy Efficiency Directive and other policy initiatives.
- Initial findings suggest that consumers are more likely to pay higher utility bills when received within the first 10 days of their (employment) salaries. Additionally, bills tend to become overdue as the time gap increases between receiving the bill and salary payment. **This timing correlation should be examined at the local level**, particularly if utility companies issue bills at different times. The results may indicate the necessity for policies governing the timing of bill issuance, and potentially the establishment of a common billing date for all energy retailers.
- Behavioural interventions can also be included in the National Energy and Climate Plans (NECP) of Member States. For this, and in general, **the EVIDENT use cases and subsequent interventions are specifically designed for replication and for considering particular characteristics** (e.g., language, consumer groups), and as such can be added in the NECPs. Furthermore, the EVIDENT tools enable the evaluation of the effectiveness of the interventions to increase energy efficiency and redesign/find-tune as needed. The approaches include randomised control trials, a quasi-experimental approach, and metering or monitoring energy consumption to calculate energy savings from behavioural measures.
- **The EVIDENT serious game can be customised** and provided to various user groups as it is an effective tool for promoting energy efficiency, offering practical advice in a user-friendly format while also gathering valuable data for scientific analysis.
- Governments and financial institutions should **consider offering more attractive low-cost loan options to encourage consumers to invest in efficient appliances**. This could include subsidies, tax incentives, or low-interest loan programs specifically targeted at energy-efficient home appliances.
- Manufacturers and policymakers should consider **promoting extended warranty programs** for efficient appliances. This could provide consumers with added confidence in the durability and longevity of these products, potentially increasing their appeal.
- **Develop targeted communication campaigns that emphasise the cost savings and long-term financial advantages of choosing energy-efficient appliances**. This can help consumers make informed decisions that align with their financial interests while also supporting environmental sustainability.
- **Energy labels and product information should be clear, easily understandable, and prominently displayed at the point of sale to help consumers make informed choices**. The project's findings suggest that these informational frames have a positive impact on appliance selection, and therefore, efforts should be made to ensure that consumers are well-informed about the benefits of efficient appliances.

- **Adding information about the financial consequences of their choices made people more likely to choose a more efficient appliance.** In the EVIDENT experiments, older people and students were less likely to choose to repair the appliance, while those who were unemployed or seeking employment were more likely to choose repair. Notably, higher environmental attitudes were related to lower willingness to pay for repairs, suggesting that environmental concerns alone may not drive behaviour change.
- **Tailor educational materials and programs to address the specific environmental knowledge and attitude gaps identified in the EVIDENT studies.** For example, create age-appropriate environmental literacy programs for different age groups and design financial literacy workshops targeting unemployed individuals and those with lower incomes to improve their decision-making skills.
- **Develop policies that accommodate the preferences and financial capabilities of different residential groups.** This could include subsidies or financial assistance programs specifically tailored to tenants and landlords to support repairs and replacements of household appliances.
- The results show that **personalised energy-saving plans work well** and that it is important to set realistic goals. Making an easy-to-use computer interface also helps people get involved and make informed choices.
- **Collaborate with financial institutions and community organisations to offer financial literacy workshops and resources,** with a focus on improving financial knowledge and skills for making sustainable financial decisions. These programs should particularly target unemployed individuals and those with lower incomes to empower them with the necessary financial knowledge.
- **Use machine learning methodologies** to provide personalised services, enhance customer experiences, and technological advancements companies in the energy and other sectors (e.g., financial, marketing, medicine, etc.). An example from EVIDENT is the development and use of machine learning algorithms to effectively forecast household energy consumption and production (prosumers).
- **The EVIDENT online platform** provides everyone the opportunity to develop serious games and customised surveys, at no cost. Additionally, the platform can be used to convey or obtain general information on energy efficiency including relevant events, policy briefs, etc.
- **Invest in further research to understand the complex relationship between environmental attitudes, financial knowledge, and willingness to pay for repairs or replacements.** This research can provide insights to inform targeted interventions and policies that effectively address the diverse factors influencing consumer behaviour.

As noted, further insights will be provided through dissemination activities including publications in scholarly journals and mainstream media, blog posts on the EVIDENT website, an EVIDENT policy brief, and others. EVIDENT researchers are also available to provide support for the design and implementation of the above actions.

This report also shows how the EVIDENT project is progressing through the monitoring of the project's Key Performance Indicators (KPIs). The analysis proves that the project has already exceeded several KPI targets and is on-track to meet the majority of the KPIs.

# 1. Introduction

## 1.1 Purpose of the deliverable

Horizon 2020 project EVIDENT - 'bEhavioral Insights and Effective eNergy policy aCTions' provides new insights relevant to energy efficient policy interventions. The project aims to identify and evaluate the heuristics and behavioural biases that impact consumer decision-making regarding energy efficiency by utilizing surveys, serious games, and field trials.

In this report, we outline initial scientific findings from EVIDENT and highlight insights, specifically those pertinent to policymakers. Our focus is on energy efficiency policy measures aimed at decreasing energy consumption and promoting the adoption of energy-efficient technologies. The deliverable also offers a summary of the EVIDENT project's advancement, primarily through pre-established Key Performance Indicators (KPIs).

## 1.2 Relation with other deliverables and tasks

This deliverable falls under Task 5.1 – 'Impact evaluation plan and policy measures' which is dedicated to transforming results in policy measures. This deliverable covers the period up to January 2024.

As per the EVIDENT Grant Agreement, this deliverable receives inputs from EVIDENT work packages 2 (WP2) 'Policy interventions and pilots design' and WP4 - 'Econometric analysis and policy evaluation', and updates D5.1 – 'Impact evaluation plan and policy measures'<sup>1</sup>. As an update to D5.1, some paragraphs and sentences may be repeated to avoid the need for the reader to constantly switch between the two reports (D5.1 and D5.2). In this manner, this deliverable provides a comprehensive overview.

## 1.3 Structure of the Document

This deliverable is structured as follows:

- Section 1 presents an introduction and the deliverable's scope
- Section 2 informs on the policy background
- Section 3 discusses the various methods for assessing policy impacts
- Section 4 provides an overview of EVIDENT, initial results and policy implications
- Section 5 reviews the progress of EVIDENT
- Section 6 summarises and concludes this deliverable

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<sup>1</sup> All EVIDENT deliverables can be found here: <https://evident-h2020.eu/deliverables/>

## 2. Policy background

In 2019, the European Commission launched the **European Green Deal**, a comprehensive set of policy initiatives designed to revamp the European Union (EU) into a modern, resource-efficient, and competitive economy, with the goal of addressing the urgent challenges of climate change and environmental degradation while ensuring<sup>2</sup>:

- No net emissions of greenhouse gases by 2050
- Economic growth decoupled from resource use
- No person and no place left behind

Examples of delivering on the European Green Deal include the commitment by the EU Member States to make the EU the first climate-neutral continent by 2050. To achieve this goal the Member States pledged to reduce emissions by at least 55% by 2030, compared to 1990 levels ('Fit for 55' package). Additionally, legally binding climate targets include emissions reduction targets across several sectors, social support for citizens and small businesses, an updated emissions trading system to cap emissions, and others. Additionally, in February 2024 the European Commission recommended reducing net greenhouse gas emissions in the EU by 90% by 2040 compared to 1990 levels, which is in line with recent scientific advice and the EU's commitments under the Paris Agreement<sup>3</sup>.

Energy efficiency is a key element of the European Green Deal with an EU-level target for improving energy efficiency by 11.7% by 2030, i.e. to reduce the EU's final energy consumption. Member States will have to make annual savings of 1.49% on average from 2024 to 2030. The overall aim of energy efficiency measures is to lower the energy needed to supply products and services, without compromising their quantity or quality. These initiatives can contribute to the reduction of greenhouse gas emissions, cost savings on energy bills, and the enhancement of overall energy use sustainability.

Within the European Union, there has been a sustained emphasis on energy efficiency. For this several measures have been established, aiming at fostering energy efficiency throughout the Member States, including the:

- Energy Efficiency Directive ([Directive \(EU\) 2023/1791](#)), which (also) sets binding targets for Member States to reduce their energy consumption
- Energy Performance of Buildings Directive ([Directive 2010/31/EU](#) amended in 2018), which requires that Member States set minimum energy performance requirements for both newly constructed and existing buildings, implement long-term renovation strategies, enhance support for solar energy in buildings, including a selected phased-in compulsory installation of rooftop solar energy (solar rooftop initiative) and energy demand reduction measures, etc.
- The [renovation wave strategy](#), published by the European Commission in October 2020, is an initiative to increase renovation rates by at least double over the next decade and ensure that renovations result in improved energy and resource efficiency is part of the renovation wave strategy.

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<sup>2</sup> The European Green Deal [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)

<sup>3</sup> See <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2024%3A63%3AFIN>

- [European Energy Efficiency Fund](#) is a public-private partnership (PPP) that combines private and public capital for climate-related investments.
- [Ecodesign for Sustainable Products Regulation \(ESPR\)](#), published on 30 March 2022, provides a framework for setting requirements on product durability, reusability, upgradability and reparability, energy and resource efficiency, information requirements including a Digital Product Passport, and others. This framework aims to achieve 132 million tonnes of oil equivalent (mtoe) in primary energy savings by 2030. This is equivalent to 150 billion cubic meters of natural gas, nearly matching the EU's import of Russian gas.
- [Energy Labelling Directive](#) which mandates that product manufacturers provide details about the energy efficiency aspects of their products.

Especially since 2020, the European Union is ever increasing its efforts to promote energy efficiency behaviours, and to provide consumers with a better understanding of their energy consumption<sup>4</sup>. One example is the EU energy labelling system, which was implemented in 1994 with the intention of lowering consumer energy use. It was subsequently updated to incorporate a more straightforward grading system that would be more compatible with all appliances and devices. This new system is being gradually introduced since 2021. An example of the differences between the previous and current systems is provided in Figure 1. More information on the labelling system can be found in the relevant EVIDENT blog post: 'The energy labelling system in the EU.' (<https://evident-h2020.eu/the-energy-labelling-system-in-the-eu/>).

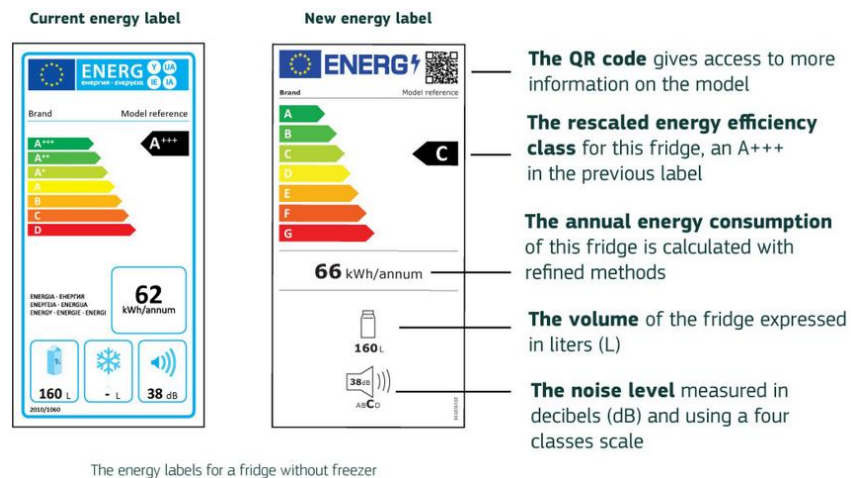
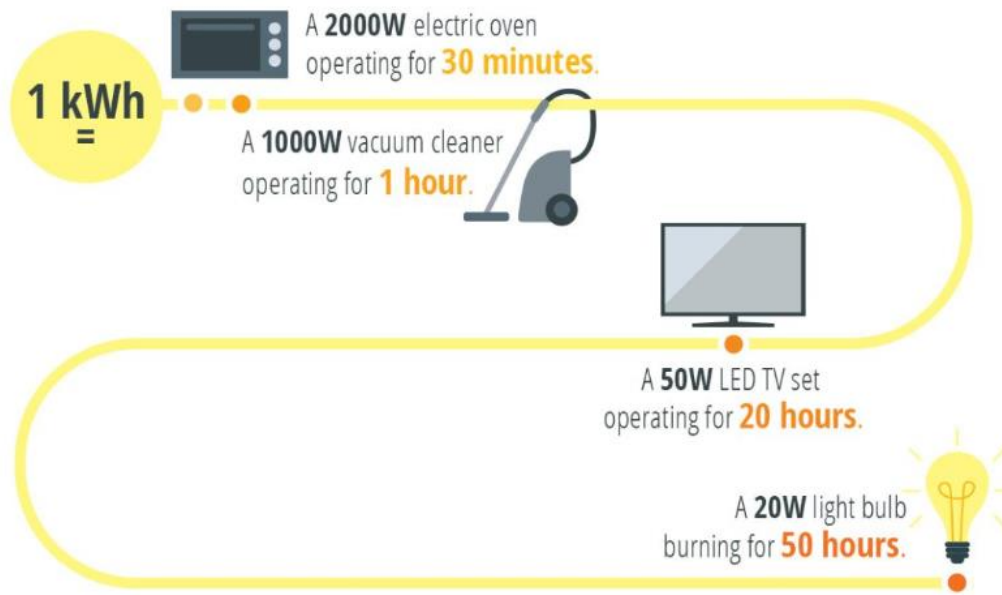


Figure 1. From the Commission page: 'How to recognise a rescaled product?' (EC)<sup>5</sup>

Another example is provided in Figure 2 which is an excerpt from an infographic explaining energy concepts to a wide audience, while other examples are presented in a relevant EVIDENT blog post: <https://evident-h2020.eu/how-does-evident-support-energy-efficiency-policies/>

<sup>4</sup> For an overview of behaviourally informed policy-making in the EU see Baggio et al. (2021).

<sup>5</sup> Source: [https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/energy-label-and-ecodesign/about\\_en](https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/energy-label-and-ecodesign/about_en)



Annual electricity consumption of a medium-sized household: **2,500-5,000 kWh**

What matters is not how much energy a device uses, but how efficient it is. For example, an energy-efficient vacuum cleaner can be better at getting rid of dirt than one using more power.

Figure 2: From an infographic explaining basic concepts (European Parliament<sup>6</sup>)

<sup>6</sup> Source: European Parliament <https://www.europarl.europa.eu/news/en/headlines/economy/20160613STO31954/buying-energy-efficient-products-the-eu-energy-label-explained>



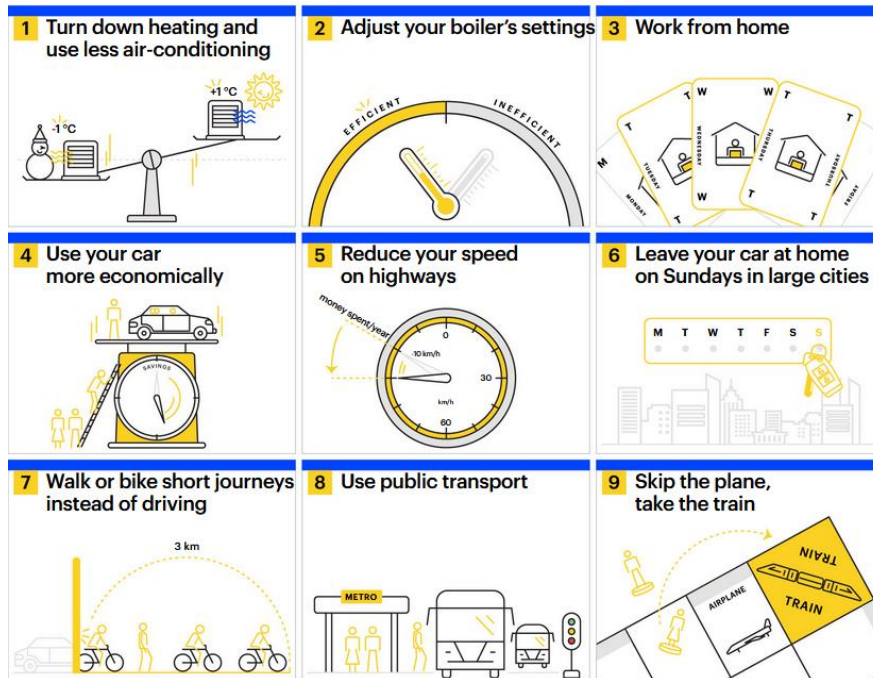


Figure 3: From the EC – IEA report ‘Playing my part’ (<https://www.iea.org/reports/playing-my-part>)

Additionally, in April 2022, the European Commission (EC) and the International Energy Agency (IEA) published their ‘Playing my part’ report which provides simple steps to European citizens, companies, and public institutions for saving money, reducing reliance on Russian energy, supporting Ukraine, and helping the planet (Figure 3). It also urges national and local governments to facilitate additional energy savings and endorse consumer initiatives. The authors state that by taking ‘simple’ energy-saving actions, EU citizens could save enough natural gas to heat 20 million homes. Furthermore, a typical EU household could save almost 500 euros a year if all recommendations are followed.

In this context, EVIDENT can contribute to the achievement of energy efficiency targets. As noted in previous EVIDENT deliverables (e.g., D1.1 and D3.3), behavioural measures have been explored over the years in various pilots and policy interventions, and in recent years their popularity is ever increasing. For example, in an overview of the academic literature, the European Environment Agency (2013) found that there is significant potential for energy savings due to measures targeting behaviours, summarised in Figure 4. However, the potential savings vary among the different interventions and the assessment methodologies may also differ, thus, the results may not be entirely comparable. Additionally, ‘rebound effects’ are present, that is, energy savings generated through energy efficiency measures may lead consumers to offset these measures through increased consumption, while the complexity of information and other challenges may impede the effectiveness of these measures. Another concern regards whether the behavioural changes are short-lived or permanent. Most studies focus only on the short-term aspects.

Intervention	Range of energy savings
Feedback	5–15 %
Direct feedback (including smart meters)	5–15 %
Indirect feedback (e.g. enhanced billing)	2–10 %
Feedback and target setting	5–15 %
Energy audits	5–20 %
Community-based initiatives	5–20 %
Combination interventions (of more than one)	5–20 %

**Figure 4: Potential energy savings due to measures targeting behaviour. Source: European Environment Agency (2013)**

EVIDENT D5.1 – ‘Impact evaluation plan and policy measures’<sup>7</sup> provides a brief overview of the barriers to energy efficiency, and some European energy policy measures. Barriers exist in many scientific and industrial domains across diverse social, technological, and financial regimes and they showcase the challenges associated with implementing energy-efficient practices.

An example of potential barriers is provided by Reddy (2001) who divided them into the following categories:

- Awareness and information
- Financial-economic
- Institutional-organizational
- Personnel and behavioural
- Regulatory
- Technological

More examples and a synthesis of the relevant literature are provided in D5.1.

Concerning European energy policy measures, D5.1 provides an overview of the history of European energy policies (e.g., the Lisbon Treaty), and contemporary targets and policies such as COP21 (‘Paris Agreement’), the Strategic Energy Technology Plan, European Green Deal, and the REPowerEU Plan. The deliverable also includes a summary of the seventh report on the state of the Energy Union<sup>8</sup>. For the purposes of this deliverable, we focus on the EU Energy Efficiency Directive, which was revised since D5.1 was published.

<sup>7</sup> [http://evident-h2020.eu/wp-content/uploads/2023/01/EVIDENT\\_D5.1\\_Impact\\_evaluation\\_plan\\_and\\_policy\\_measures.pdf](http://evident-h2020.eu/wp-content/uploads/2023/01/EVIDENT_D5.1_Impact_evaluation_plan_and_policy_measures.pdf)

<sup>8</sup> European Commission. Home. Topics. Energy strategy. Energy Union. Seventh report on the state of the energy union [online]. Available: [https://energy.ec.europa.eu/topics/energy-strategy/energy-union/seventh-report-state-energy-union\\_en?fbclid=IwAR3W5U0eS5jMGA7wgtYmgU8U0L0jB4rQLdz\\_V-T9hvKIGwI4\\_5\\_5kE1wBo#documents](https://energy.ec.europa.eu/topics/energy-strategy/energy-union/seventh-report-state-energy-union_en?fbclid=IwAR3W5U0eS5jMGA7wgtYmgU8U0L0jB4rQLdz_V-T9hvKIGwI4_5_5kE1wBo#documents)

## 2.1 The EU Energy Efficiency Directive

In the context of the EVIDENT project, it is important to reference the **Energy Efficiency Directive (EED)**<sup>9</sup>, especially as it was revised just a few months before the finalisation of this deliverable (D5.2), i.e., it was published in the Official Journal on 20 September 2023 and entered into force on 10 October 2023. Since its original inception in 2012<sup>10</sup>, the EED requires Member States to set indicative national energy-efficiency targets to ensure that the EU reached its targets of reducing energy consumption. It was revised in 2018 and again in 2023 ('recast EED'), raising the EU's ambition on energy efficiency with each revision.

The recast EED acknowledges that people's behaviour is crucial for achieving the goals of energy efficiency, and it aims to raise awareness and provide information to help people adopt more energy-saving habits. It includes several measures that foster behavioural change. For instance, large companies must conduct energy audits every four years to find out how they can save energy and share the results with their employees and stakeholders. This requirement aims to raise awareness and help create a culture of energy efficiency within the organisation. The recast EED also supports the use of energy-efficient technologies, such as smart grid technologies and appliances. These smart technologies can increase awareness and encourage energy-saving behaviour by giving real-time feedback on energy use and potential savings. Additional provisions include setting up more frequent and transparent billing systems based on actual consumption patterns, implementing information and empowerment programs, and exchanging and disseminating information to raise awareness.

Provisions such as the above show that the promotion of energy efficiency requires addressing how consumers behave and how they can be empowered, but the European Commission found that this is a challenge for Member States, especially at the local level<sup>11</sup>.

In 2021, the European Commission proposed a revision of the EED<sup>12,13</sup> which would introduce higher targets for reducing primary and final energy consumption by 2030, in line with the Climate Target Plan. Other elements of the proposal included a near doubling of Member State annual energy savings obligations in end-use while considering alleviating energy poverty and strengthening consumer empowerment. After extended deliberations of the co-legislators and numerous consultations, the EED was revised ('recast') in 2023 and entered into force in the same year<sup>14</sup>. This **new EED recast** sets a **higher target** for 2030, where the EU will have to decrease both its **primary and final energy consumption** by at least 11.7% compared with the energy consumption forecasts for 2030, compared to the PRIMES 2020 reference scenario<sup>15</sup>. These targets translate into an upper limit to the EU's final energy consumption of 763 million tonnes of oil equivalent and 993 million tonnes of oil equivalent for primary consumption (Figure 5). Some of the estimated benefits from meeting this target are presented in (Figure 6). As noted, the revised directive more than doubles the annual energy savings obligation by 2028, as presented in

<sup>9</sup> Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955 (recast) (Text with EEA relevance) [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJOL\\_2023\\_231\\_R\\_0001&qid=1695186598766](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJOL_2023_231_R_0001&qid=1695186598766)

<sup>10</sup> Directive 2012/27/EU <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02012L0027-20210101>

<sup>11</sup> SWD(2021) 623 final <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52021SC0623>

<sup>12</sup> <https://ec.europa.eu/3850b449-eada-41a8-9ba2-2d7dbf1bf82f>

<sup>13</sup> [https://commission.europa.eu/news/commission-proposes-new-energy-efficiency-directive-2021-07-14\\_en](https://commission.europa.eu/news/commission-proposes-new-energy-efficiency-directive-2021-07-14_en)

<sup>14</sup> [https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive\\_en](https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive_en)

<sup>15</sup> In effect, the new EU 2030 binding target for final and primary energy consumption is 36%-39%.

Figure 7. This is a key policy instrument of the directive, aimed at achieving the headline target and promoting energy savings in end-use sectors, including buildings, industry, and transport.

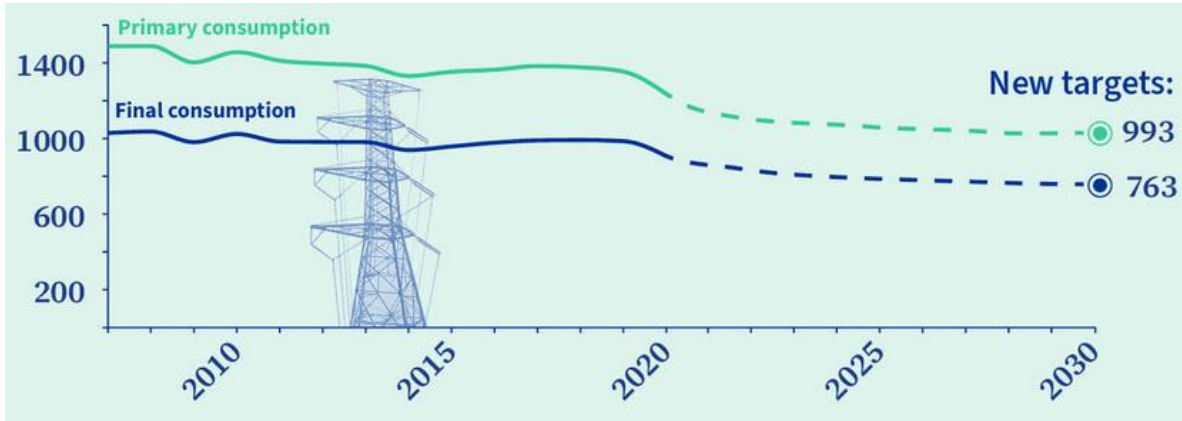


Figure 5. Primary and final energy consumption targets for EU27 (mega tonnes of oil equivalent)<sup>16</sup>

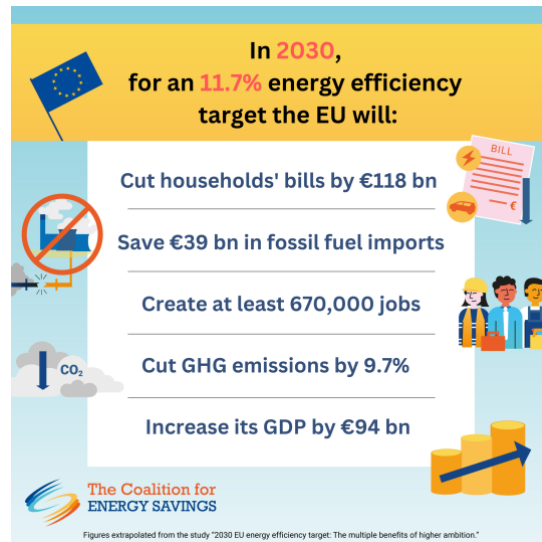


Figure 6. Benefits from the new energy efficiency target<sup>17</sup>



Figure 7. Annual energy savings obligation by 2028 (recast EED Article 8).

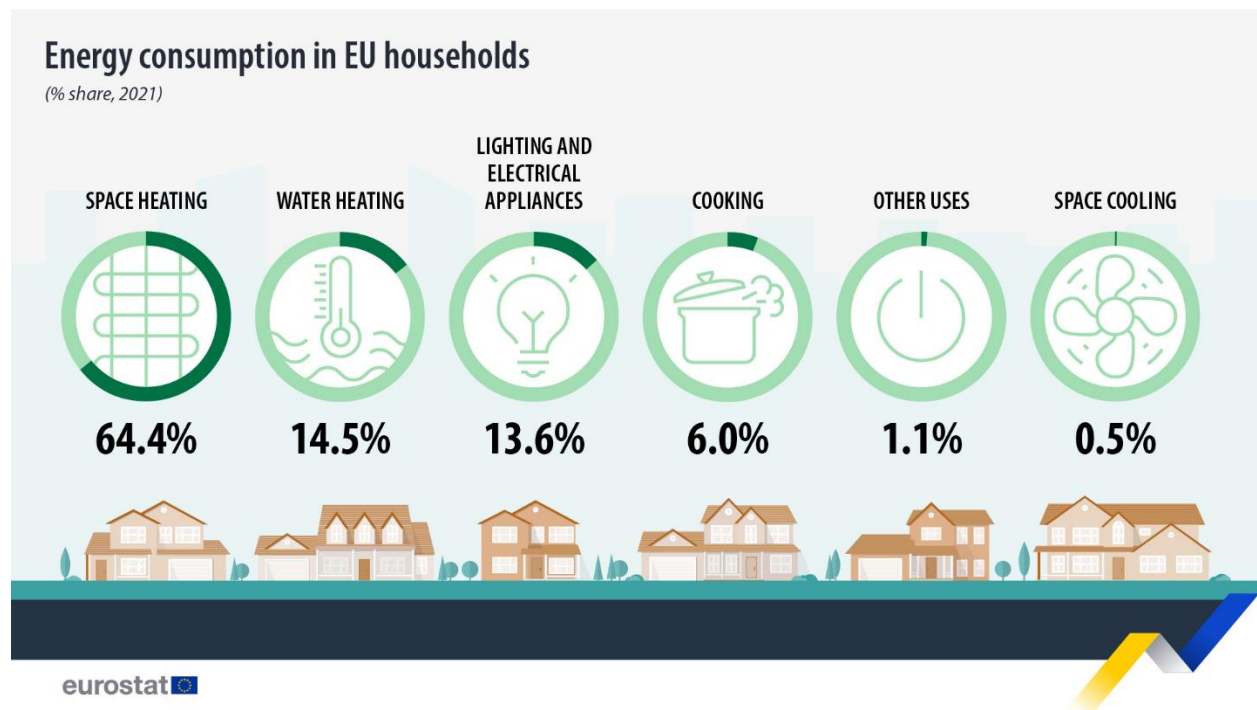
<sup>16</sup> Source: <https://www.consilium.europa.eu/en/infographics/fit-for-55-how-the-eu-will-become-more-energy-efficient/>

<sup>17</sup> Source: The Coalition for Energy Savings [https://sustainable-energy-week.ec.europa.eu/news/energy-efficiency-directive-new-rules-more-savings-higher-benefits-2023-05-04\\_en](https://sustainable-energy-week.ec.europa.eu/news/energy-efficiency-directive-new-rules-more-savings-higher-benefits-2023-05-04_en)

As noted, the recast EED also requires that Member States ensure new annual savings of 1.49% of final energy consumption on average during this period, gradually reaching 1.9% on 31 December 2030. In this context, the recast EED also obliges Member States to indicate a trajectory to achieve the 2030 objectives and describe the underlying methodology and assumptions used to develop those trajectories. Additionally, Every Member State shall develop and execute new energy savings policies, measures, and programs to expedite the attainment of energy savings in order to meet their increased energy efficiency targets for 2030. These measures must be clearly described and quantified in terms of energy savings in the updated National Energy and Climate Plan (NECP) of each Member State<sup>18</sup>.

Also relevant for EVIDENT is that the recast EED maintains and expands behavioural interventions for reducing energy consumption (e.g., consumer empowerment), including the promotion of information campaigns, eco-driving, energy communities, ‘publicly supported energy consumption assessments and targeted advisory services and support for household consumers,’ engagement strategies, providing advice on energy consumption behaviour, and others.

These interventions can lead to significant savings as in 2021, households accounted for 27% of final energy consumption in the EU (Eurostat<sup>19</sup>). The heating of space and water represented 78.9% of the final energy consumed by households (Figure 8).



<sup>18</sup> For more information on the National Energy and Climate Plans (NECPs) see [https://energy.ec.europa.eu/topics/energy-strategy/national-energy-and-climate-plans-necps\\_en](https://energy.ec.europa.eu/topics/energy-strategy/national-energy-and-climate-plans-necps_en)

<sup>19</sup> [Energy use in households up 6% in 2021 - Eurostat \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1)

**Figure 8. Energy consumption in EU households. Source: Eurostat<sup>19</sup>.**

The recast EED places particular importance on billing information and annual statements especially for providing consumers data on consumption and costs. Additionally, recast EED Article 17(2) states that:

*'[...] Member States shall ensure that final customers have the possibility of easy access to complementary information on historical consumption allowing detailed self-checks. Complementary information on historical consumption shall include:*

- (a) cumulative data for at least the three previous years or the period since the start of the supply contract if this is shorter;*
- (b) detailed data according to the time of use for any day, week, month, and year.'*

More relevant provisions are included in the EED pertaining to the option of **electronic billing information**, that energy costs are 'provided to consumers on demand, in a timely manner, and easily understandable format enabling consumers to compare deals on a like-for-like basis' (Article 17(3)(e)), and others.

In this context, behavioural interventions such as those proposed by the EVIDENT project can contribute to achieving the targets, in a comprehensive and cost-friendly manner.

The EVIDENT project aims to translate insights from behavioural science into thorough policy interventions. In this direction, it incorporates several participants in field experiments, new analytical tools, and an integrated platform with methods, datasets, tools, and reports.

The objectives of policy implementation and interventions, particularly those pertaining to the aforementioned policies, are the main emphasis of this report. The report makes a connection between the scientific findings from EVIDENT and certain regulatory and policy initiatives, in addition to public awareness campaigns.

It should also be noted that there are several past and ongoing Horizon projects that have similar goals to EVIDENT but use different approaches, could be combined or supplemented to those of EVIDENT. A partial list of these projects can be found in D1.1 – 'Analysis of best practices' (Section 6)<sup>20</sup> and on the EVIDENT website: <https://evident-h2020.eu/sister-projects/>

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<sup>20</sup> [https://evident-h2020.eu/wp-content/uploads/2021/12/EVIDENT\\_D1.1\\_Analysis\\_of\\_Best\\_Practises.pdf](https://evident-h2020.eu/wp-content/uploads/2021/12/EVIDENT_D1.1_Analysis_of_Best_Practises.pdf)

### 3. Policy impact assessment methods

#### 3.1 Overview of common methods

Among the main objectives of the EVIDENT project is the evaluation and proposal of specific policy interventions that can enhance energy efficiency and contribute to its policy implementation. In this context, it is important to develop and implement methods for understanding if these policies work, and the level of impact that they could have on intended groups. In this context, **impact evaluation methods** can provide useful insights.

Impact evaluation methods for policies are techniques that aim to measure the causal effects of policies or interventions. They can be broadly classified as quantitative or qualitative, ex-ante or ex-post, etc. An analytical discussion of these classifications and the relevant literature can be found in D5.1 while a visualised summary is provided in Table 1.

**Table 1: Impact assessment types**

Impact Assessment Types			
	Quantitative		Qualitative
Categories	Ex ante	Ex post	-
When	Before Intervention	Before & After Intervention	Before Intervention
Results	Predictions	Actual Estimates	Knowledge

Source: EVIDENT D5.1

There are different methods that can be used depending on the research question, the availability of data, and the design of the policy or intervention. Some of the most common methods are:

- **Randomised controlled trials (RCTs):** These are experiments where a random subset of the population is assigned to receive the policy or intervention, while the rest serves as a control group. The difference in outcomes between the two groups can be attributed to the policy or intervention. RCTs are considered the gold standard of impact evaluation, but they can be costly, time-consuming, and ethically challenging to implement.
- **Matching methods:** These are quasi-experimental methods that try to find a comparable control group for the treated group based on observable characteristics. Matching methods rely on the assumption that there are no unobserved factors that affect both the treatment assignment and the outcome. Matching methods can be used when randomisation is not feasible or ethical, but they require a large and rich dataset to find good matches.

- Regression discontinuity design (RDD): This is a quasi-experimental method that exploits a sharp cut-off in the eligibility criteria for receiving the policy or intervention. For example, if a policy targets people below a certain income level, then those who are just below and just above the cut-off can be compared to estimate the impact of the policy. RDD assumes that there are no other factors that change abruptly at the cut-off, and that people cannot manipulate their eligibility status.
- Difference in difference (DID): This is a quasi-experimental method that compares the changes in outcomes over time between a treated group and an untreated group. DID assumes that the two groups would have followed parallel trends in the absence of the treatment and that there are no spillover effects or common shocks that affect both groups.
- Instrumental variables (IV): This is a quasi-experimental method that uses a variable that affects the treatment assignment but not the outcome, to isolate the causal effect of the treatment. For example, if a policy is implemented in some regions but not others due to political reasons, then regional variation can be used as an instrument for the policy. IV assumes that the instrument is relevant (i.e., it affects the treatment) and exogenous (i.e., it does not affect the outcome directly or through other channels).

While the various methods can be used in combination, the one (or ones) selected will depend on the project's characteristics, such as how many resources it has, the number of participants, and others.

More information on the above, provided in a user-friendly format, can be found on the Joint Research Centre's (JRC's) webpage [Policy impact evaluation: methods and data](#), and in D5.1 – "Impact evaluation plan and policy measures". Practical examples geared to researchers can be found in Crato and Paruolo (2019).

## 3.2 Stakeholder analysis

Important aspects of any impact analysis consideration are the target groups and key stakeholders. The relevant analysis for EVIDENT is included in D7.2 – 'Report on dissemination and impact assessment' (Figure 9), while a summary of the identified stakeholders is provided below.





Figure 9. The EVIDENT key stakeholders (Source: EVIDENT D7.2<sup>21</sup>)

- **Power industry:** This group includes firms that produce, supply, or manage electricity. It also covers producers, operators, retailers, etc.
  - Potential added value from the EVIDENT project: Learn how to run a trial to study their customers’ behaviours and needs.
  
- **Software industry:** This group covers software firms that make or use smart grid or electric grid software.
  - Potential added value from the EVIDENT project: They will gain the skills and tools to develop software to analyse and handle big data from energy firms.
  
- **Research and scientific communities:** This group consists of scientists and researchers in energy behaviour, econometrics, data analysis, machine learning, and visualisation.
  - Potential added value from the EVIDENT project: They will learn about new methods and algorithms in behaviour, big data, surveys, and data management.
  
- **Related EU-funded projects:** The EVIDENT project will connect with EU projects that explore related topics and create channels for collaboration.
  - Potential added value from the EVIDENT project: They will benefit from exchanging knowledge and best practices on relevant research subjects.
  
- **Standardisation community:** Experts in the relevant standardisation bodies.

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<sup>21</sup> [https://evident-h2020.eu/wp-content/uploads/2021/12/EVIDENT\\_D7.2-Report\\_on\\_dissemination\\_and\\_impact\\_assessment.pdf](https://evident-h2020.eu/wp-content/uploads/2021/12/EVIDENT_D7.2-Report_on_dissemination_and_impact_assessment.pdf)

- Potential added value from the EVIDENT project: They will obtain a better understanding of consumers' behaviours which will enable more concrete and robust solutions.
- **General public:** This refers to a non-scientific audience who wants to learn about the project results in a straightforward way.
  - Potential added value from the EVIDENT project: The project aims to promote energy and economic efficiency, so the public can benefit from knowing the factors that affect their consumption behaviour.
- **Policy makers:** The project will target various policy and legislative bodies in the EU that influence energy choices and technology changes (Commission, national bodies, etc.). The project's results will be used to discuss with EU institutions to support policy actions aligned with the European Green Deal.
  - Potential added value from the EVIDENT project: Policy and legislative bodies will gain knowledge and participate in a dialogue to make informed decisions on future energy policies, especially on the efficacy and replicability of behavioural interventions such as those employed by the EVIDENT project.

## 4. The EVIDENT project

The EVIDENT project focuses on explaining behaviour and identifying drivers for household energy consumption. It aims to provide insights into energy efficiency policy interventions by employing field trials, surveys, and serious games to examine behavioural biases and heuristics affecting consumers’ energy conservation. The results of this research will be employed to assess and recommend policy measures for enhancing energy efficiency. These measures aim to decrease energy consumption and facilitate the widespread adoption of energy-efficient approaches. The scope of the project is briefly summarised in Figure 10.

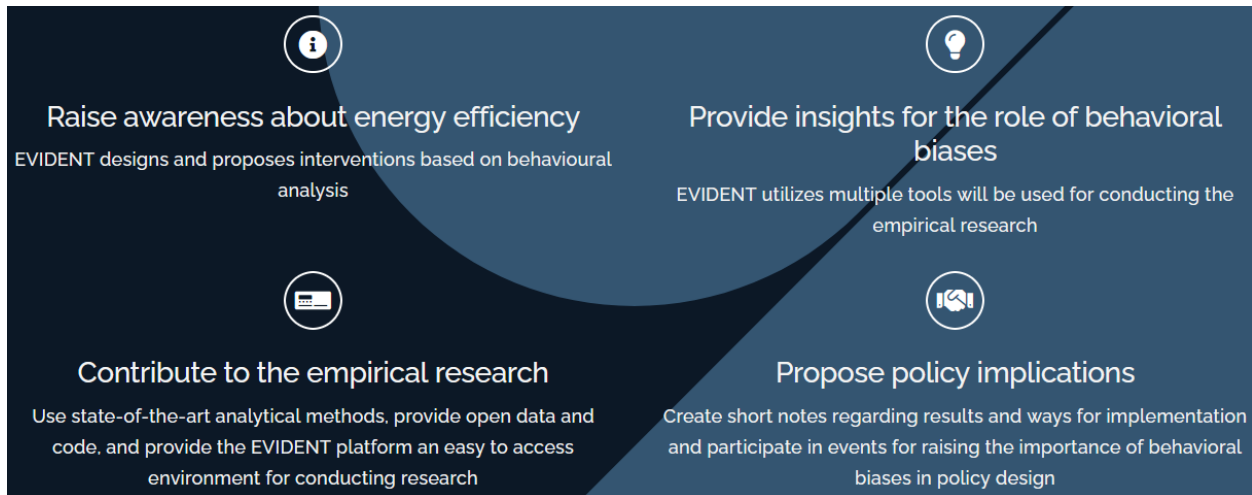


Figure 10 Scope of the EVIDENT project (<https://evident-h2020.eu/>)

### 4.1 The objectives of the EVIDENT project

The goal of the EVIDENT project is to create a comprehensive system to enhance the effectiveness of non-price energy interventions. This includes developing a framework to understand the key factors influencing individual decision-making processes and establishing connections between energy consumption, financial literacy, and environmental awareness. EVIDENT aims to provide accurate estimates and policy recommendations for effective interventions. The main objective of EVIDENT is to implement behavioural interventions in energy efficiency policies to achieve substantial environmental and economic benefits. The project will focus on involving end users in experiments, games, and surveys, using innovative tools and methodologies to advance knowledge, and creating a digital platform to promote energy efficiency.

The main objectives of the EVIDENT project are provided below<sup>22</sup>.

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<sup>22</sup> A briefer description of these objectives can be found in: [https://evident-h2020.eu/wp-content/uploads/2021/10/Evident\\_Poster.pdf](https://evident-h2020.eu/wp-content/uploads/2021/10/Evident_Poster.pdf)

**Objective #1:** Create a novel framework of analysis for assessing the role of behavioural insights in energy efficiency using a wide range of case studies, experiments, surveys, RCTs in conjunction with state-of-the-art econometric methods and big-data analytics by considering participants’ characteristics.

**Objective #2:** To develop a platform to raise energy efficiency awareness and support better decision-making and policy implementation.

**Objective #3:** To enable future research related to behavioural biases and heuristics in energy efficiency by creating through the platform a methodology and data hub.

**Objective #4:** To contribute to energy efficiency policy implementation by evaluating and proposing specific policy interventions to enhance energy efficiency. Design and demonstrate five large-scale pilots across Europe, including well-developed and developing countries in energy-efficient systems.

**Objective #5:** Enable wide communication and scientific dissemination of innovative results to the industry, citizens, energy communities, and policy actors.

**Objective #6:** To design an innovative business model and conduct a cost-benefit techno-economic analysis to strengthen the role of behavioural insights in energy efficiency policy interventions.

A brief overview of EVIDENT’s objectives is found in Figure 11, while the project’s general scope and expected outcomes can be found in D5.1 - ‘Impact evaluation plan and policy measures’.

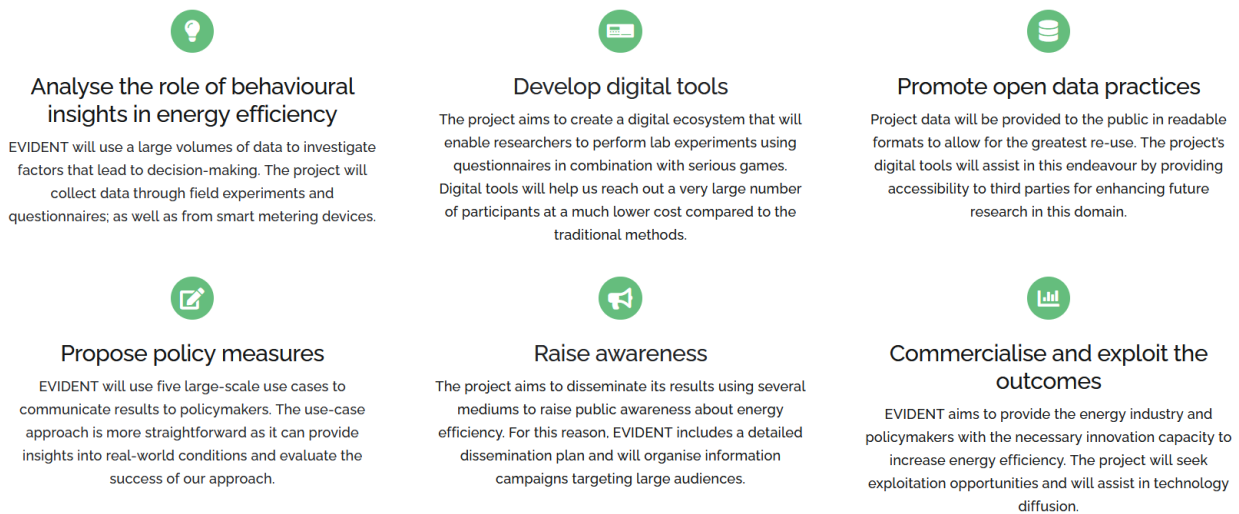


Figure 11. An overview of EVIDENT’s objectives (<https://evident-h2020.eu/objectives/>)

## 4.2 EVIDENT policy interventions

The core of the EVIDENT project lies in its five use cases, which essentially outline the project's policy interventions. These are large-scale cases aimed at assessing the impact of various policy interventions on energy efficiency. The case studies are focused on generalizing the project's findings by involving numerous participants from diverse countries. The use-case approach is intended to be simple and to provide insights into real-world conditions, thus also validating the approach taken by EVIDENT.

Furthermore, the use cases were designed so that third parties can replicate and modify them to consider different target groups. Figure 12 presents a summary of the EVIDENT use cases.

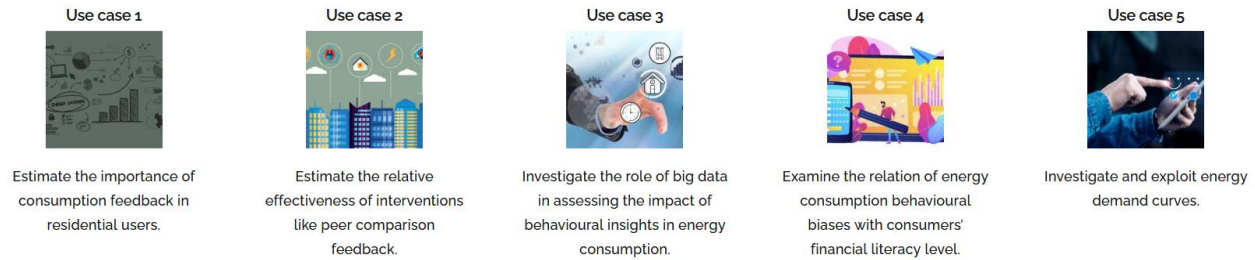


Figure 12. The EVIDENT use cases (<https://evident-h2020.eu/objectives/>)

The approaches that are followed in each of the use cases are elaborated in D2.1 – ‘Field studies, serious game and surveys protocols design and pilots design’<sup>23</sup>. A concise summary of the approaches and initial findings (when available), as well as their policy implications, are provided in the following subsections. In addition, D5.3 – ‘Data documentation’ and D4.3 – ‘Updated econometric methodologies and robustness tests’ (serious game, surveys, etc.) provide more details about the datasets and the experiments.

### 4.3 First results and policy implications

We present preliminary results from some of these activities, and their potential policy implications. However, before delving into practical examples, we offer an overview of the preliminary findings from an ongoing internal survey distributed to the EVIDENT consortium partners regarding the policy implications. The survey aims to elicit the potential policy impacts of the project, drawing on the methodologies developed and the project's findings. This quasi-self-reporting of impacts serves as an initial indication of how EVIDENT may contribute to shaping policy in various areas and policy making levels. This self-reporting is indicative and does not cover all research activities and results of the project, as some were still ongoing at the time of publication.

Figure 13 provides examples of the areas in which EVIDENT makes contributions. The most frequently mentioned area is ‘efficient appliances’, which is not surprising considering that several EVIDENT use cases focus on appliances.

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<sup>23</sup> [https://evident-h2020.eu/wp-content/uploads/2021/12/EVIDENT\\_D2.1\\_Field\\_Studies\\_Serious\\_Game\\_and\\_Surveys\\_Protocols\\_Design\\_and\\_Pilots\\_Design.pdf](https://evident-h2020.eu/wp-content/uploads/2021/12/EVIDENT_D2.1_Field_Studies_Serious_Game_and_Surveys_Protocols_Design_and_Pilots_Design.pdf)

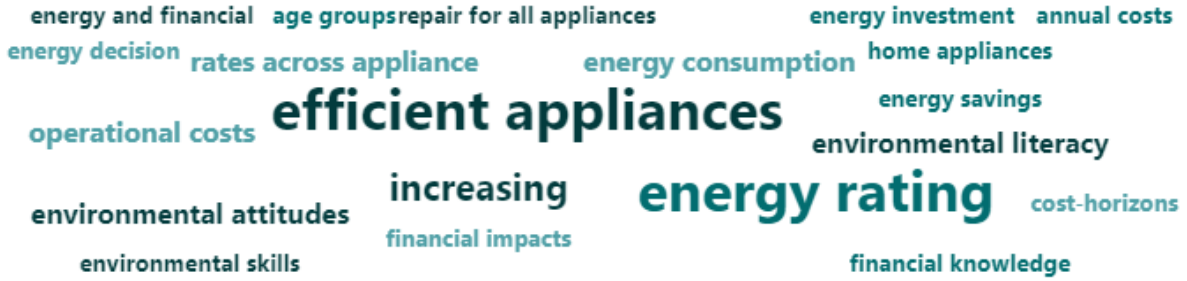


Figure 13. Areas where the EVIDENT results or methodologies can lead to policy changes or recommendations

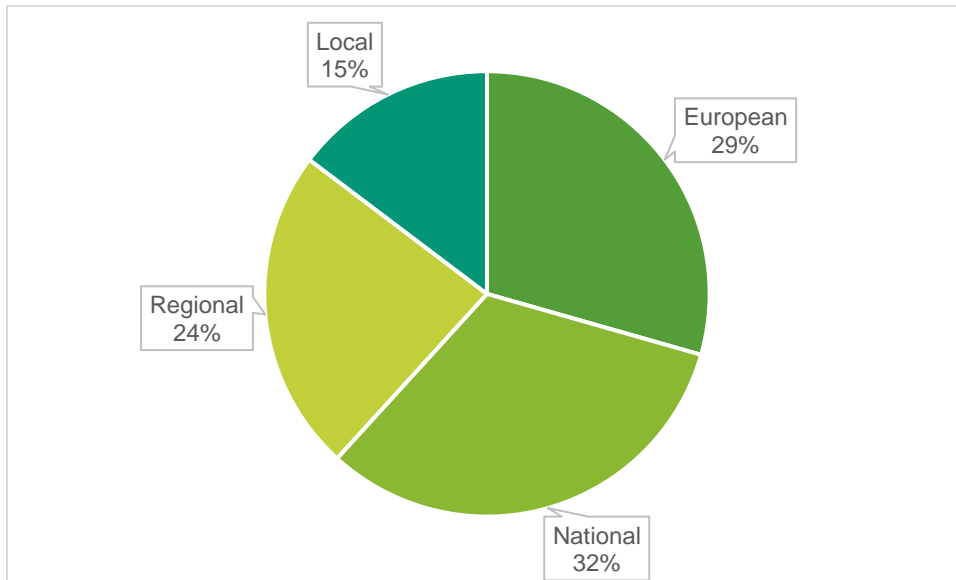


Figure 14. Relevant policy maker/making level



Figure 15. Relevant policy maker or making entities

Figure 14 and Figure 15 present the relevant policy-making levels and entities that could implement EVIDENT’s proposed interventions. It is worth noting that an intervention can involve several levels, for example, an intervention could be implemented at both the European and national levels. According to the feedback from EVIDENT researchers, the project's interventions are primarily pertinent for implementation by national ministries (75% of responses). Additionally, Figure 16 identifies additional

stakeholders who may have an interest in EVIDENT activities: methodologies, results, policy recommendations, and their implementation, etc.



Figure 16. Question: Other stakeholders that could be interested in EVIDENT’s results.

In the following subsections, we provide examples of results from the EVIDENT project and their relevant policy implications.

### 4.3.1 Home energy reports

#### 4.3.1.1 The experiment

Several research papers indicate that non-price interventions have the potential to influence energy conservation, with the observed impact varying from -2% to -20% (for example, see Myers and Souza, 2020). Nonetheless, these impacts are mostly short-term in nature.

In the context of the EVIDENT project, HERs were designed and distributed. This natural field experiment started in December 2021 and involves around 900 consumers in Sweden who also produce electricity (‘prosumers’) and are clients of CheckWatt (CW).

The prosumers subgroup has received limited attention in the literature, despite potentially having significant differences from the traditional consumers subgroup. For instance, prosumers may be less influenced by information about peer comparison in energy consumption, which is typically incorporated in the standard HER. Therefore, it is expected that production and consumption may be related and that knowledge about the prosumer’s energy purchases may be more effective in lowering consumption.

One control group and two treatment groups were established. What separates the two treatment groups is that the second treatment group’s HER also shows the consumer’s rank. There is no such information provided to the control group. Every two weeks the treatment groups receive a HER along with other information. Examples of an HER are provided in Figure 17 and Figure 18.

More details on the HER and the dissemination process are available in D2.2 – ‘Optimised Protocols design’ and D3.2 – ‘Implementation of preparatory’.

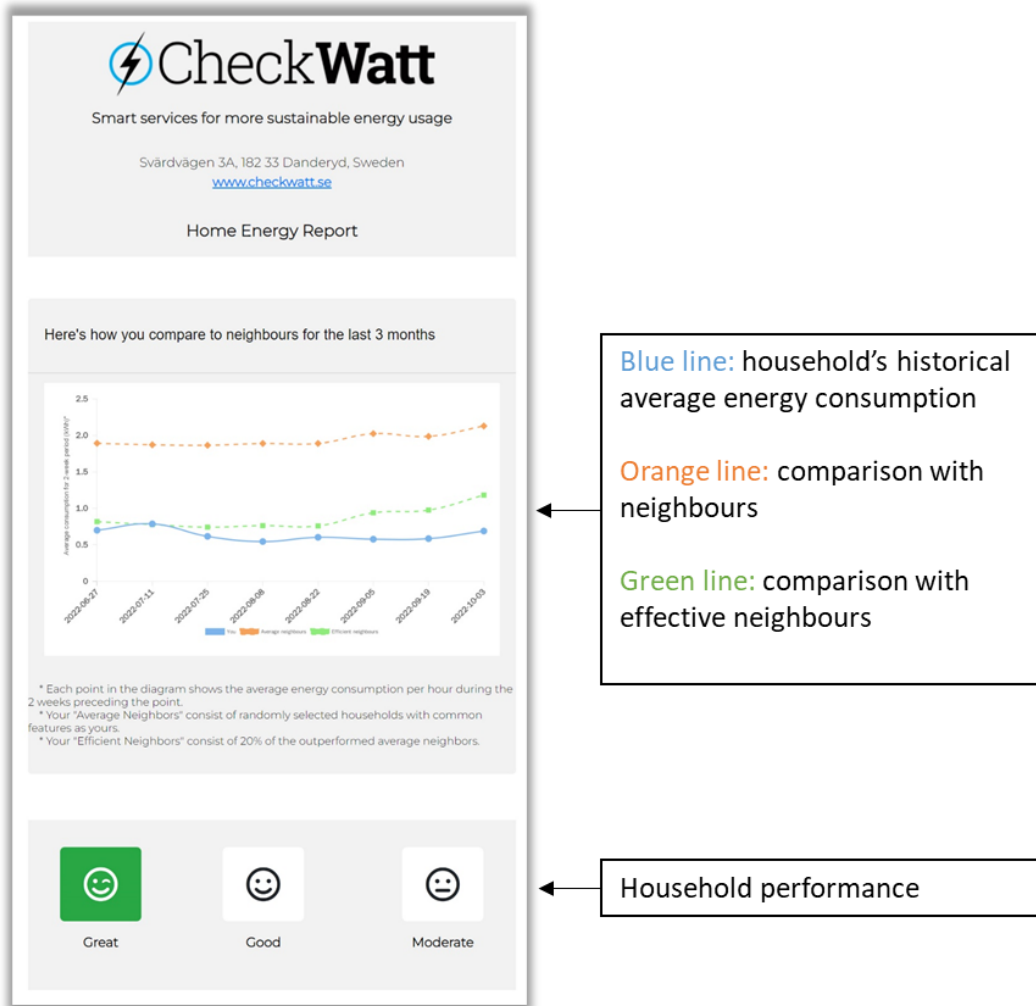
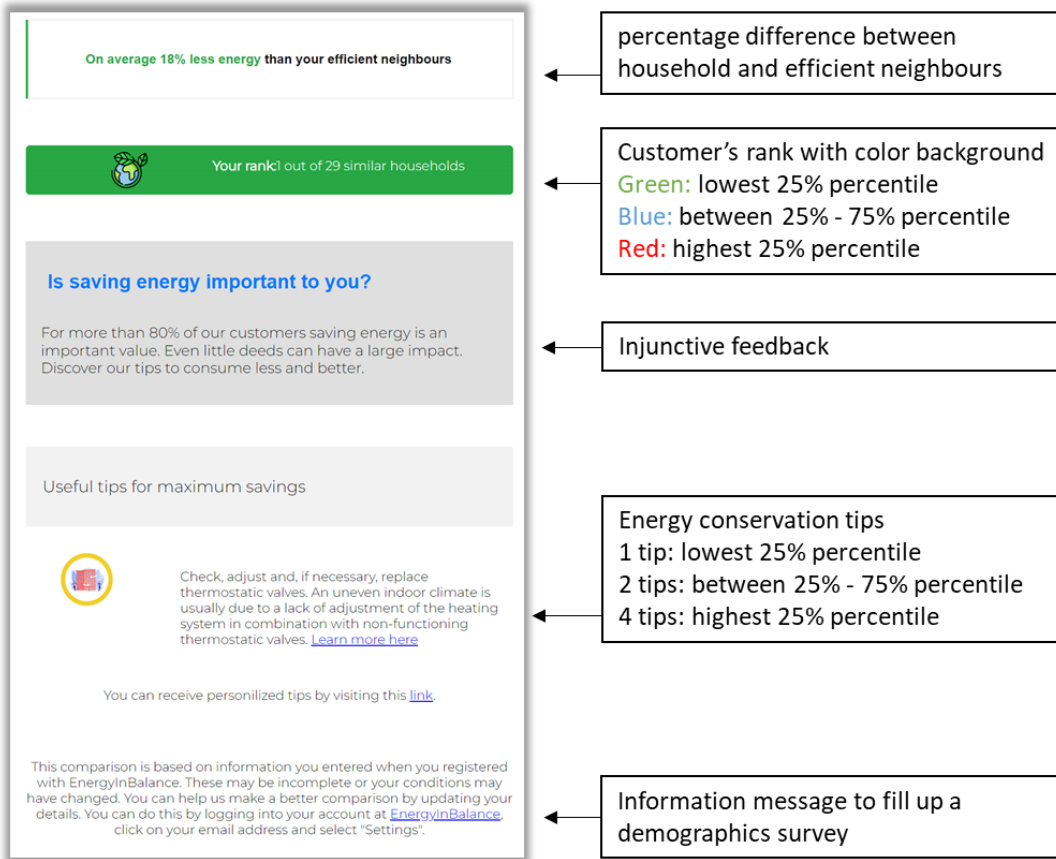


Figure 17: Example of Home Energy Report (Part 1)





**Figure 18: Example of Home Energy Report (Part 2)**

### 4.3.1.2 First results

The analysis is based on a natural field experiment in Sweden where 40 HERs were delivered to customers by the energy company CW. The experiment had two milestones and two periods, with data considered from the first 36 HER rounds. In November 2022, an additional 150 customers were included in the treatment group. The dependent variable for the analysis is the difference in average weekly electricity consumption for the pre- and post-experiment periods, and the independent variables include mean, standard deviation, skewness, and kurtosis of the pre-experiment period.

The preliminary results indicate that customers who received HERs did indeed consume less than those who did not (control group), even when accounting for seasonality and other effects. **The intervention implemented (i.e. HERs) leads to a 5% decrease in consumption and a 4% decrease in the amount of electricity bought. Furthermore, the design of the HERs (e.g., inclusion or not of the consumer's rank) also leads to differentiations in the behaviours.** The results refer to the average treatment effect without considering the participants' heterogeneity.

More information on the methodology and results are available in D4.2 – ‘Econometric methodologies and robustness tests’, with more insights to be provided in D4.3 – ‘Updated econometric methodologies and robustness tests.’

### 4.3.1.3 Policy implications

The work carried out by EVIDENT in designing and implementing HERs, or other relevant digital platforms, can provide valuable insights to European and Member State authorities into designing such interventions and assessing their effectiveness.

In this manner, this research contributes to the goals of EU policies. For example, the recast EED requires that *'[...] Member States shall ensure that final customers have the possibility of easy access to complementary information on historical consumption allowing detailed self-checks.'* (Article 17 - Billing information for natural gas). The Directive outlines a specific objective to be attained, leaving it up to each EU Member State to determine the methods for achieving this objective. According to the Directive, 'energy efficiency improvement' refers to an enhancement in energy efficiency resulting from technological, behavioural, and/or economic changes.

The tools created by the EVIDENT project, along with the insights gained, can aid in fulfilling the legal requirements and achieving the goal of increasing energy efficiency as outlined in the Directive.

We note that in the Commission recommendation on transposing the energy savings obligations under the previous Energy Efficiency Directive<sup>24</sup>, the evaluation approaches for the calculation of energy savings from behavioural measures include RCTs, quasi-experimental approach and metering or monitoring energy consumption, all of which are employed in EVIDENT's use cases. Furthermore, the recommendation states that *'Where it is not possible to use either of the above approaches, energy savings can be evaluated by metering or monitoring the participants' energy consumption before and after the intervention [...].'*

In summary, the initial high-level recommendations can be stated as:

- Design and implement HERs or relevant digital platforms at the consumer level. These can be mandated by national authorities with minimum standards required for the average effectiveness.
- Measure the effectiveness of interventions to increase energy efficiency and redesign/find-tune as needed.
- Support the implementation of the recast EED through tools and insights developed by EVIDENT, and sister projects.
- Streamline, further develop and increase the use of scientifically driven evaluation approaches such as RCTs, quasi-experimental approaches, and metering or monitoring energy consumption to calculate energy savings from behavioural measures.

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<sup>24</sup> COMMISSION RECOMMENDATION (EU) 2019/1658 of 25 September 2019 <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019H1658&from=EN>

## 4.3.2 Forecasting household energy consumption and production

### 4.3.2.1 The analysis

This research seeks to develop a data-driven energy forecasting framework and offer customers valuable insights to effectively manage their energy expenses. In essence, this analysis investigates **whether machine learning algorithms can accurately forecast household energy consumption and production for prosumers**. While various methods, such as engineering models, can predict buildings' energy consumption, machine learning approaches appear to be more adept at handling data non-linearities and have shown promising results across various domains and new applications. However, the efficiency of these approaches is significantly impacted by the quantity and quality of available data.

Utilising a distinctive dataset supplied by the CW, EVIDENT researchers constructed a data-driven analytical framework for predicting household energy consumption and production. To ascertain the most effective parameters for forecasting consumption and production, the researchers utilized various factors, including historical energy consumption and production measurements, demographic information, and weather-related data.

Initial findings suggest that machine learning (ML) models exhibit slightly superior performance compared to linear forecasting models. In the upcoming phase, further exploration of additional forecasting models, model parameters, and forecasting timeframes for energy consumption and production will be conducted.

D4.2 – ‘Econometric analysis and robustness tests’ provides additional information about the results, original data, and machine learning models.

## 4.3.3 Spending patterns

### 4.3.3.1 The experiment

A unique dataset provided by the Public Power Corporation S.A. (PPC), Greece, is used to assess whether consumers tend to stabilize their energy consumption. As per the Hellenic Independent Power Transmission Operator (IPTO), PPC holds a market share of nearly 65%, with an additional nine electricity retail providers operating within the market.

The analysis utilized 297,494 observations from 17,674 unique customers, covering the period from January 2016 to March 2022 on a quarterly basis. The observations encompass data on electricity consumption, consumption period, household size, region, invoiced amount, due payment date, and whether the customer is assigned to a Social Residential Tariff. The analysis aims to assess the hypothesis of stable consumption by determining if actual bill payments increase around the dates of the arrival of employment checks. Through an examination of billing data from PPC, we seek to establish a correlation between the bill's due date and the probability of timely payments and to determine if this has an impact on customer loyalty.

### 4.3.3.2 Preliminary results and policy implications

The initial findings suggest that **consumers tend to allocate a significantly higher amount of money towards utility bills when the bills are received within the first 10 days of their employment salaries**.

This contrasts with the conventional smooth consumption hypothesis and indicates a consumer bias towards increased spending around their payment day. Furthermore, **bills are more likely to be overdue as the time gap between receiving the bill and the salary payment increases**. As a result, there are policy considerations related to the timing of bill issuance and the potential implementation of a common bill issue date for all energy retailers. Additionally, the research will provide valuable insights into the importance of addressing financial literacy issues, such as offering practical tips for managing expenses to customers.

D4.2 – ‘Econometric analysis and robustness tests’ and D4.3 – ‘Updated econometric analysis and robustness tests’ provide additional information on the original data, results, and the utilized econometric methods.

#### **4.3.4 The impact of financial capacity and risk reduction on investment decisions for efficient home appliances**

While energy labels have shown promise in influencing home appliance purchases, further efforts are necessary to boost their effectiveness in promoting efficient appliances. Research has explored the impact of operating costs, but the influence of financial capacity, loss aversion, and risk reduction remains unaddressed. Additionally, it is important to consider how consumer motivations, skills, and demographics affect sensitivity to information, especially among vulnerable sub-populations. EVIDENT researchers aim to assess the impact of financial, environmental, and energy literacy, as well as informational frames at the point of sale, on the investment in efficient home appliances.

A study is being conducted across Europe through an online discrete choice experiment involving 2200 participants. The included attributes are financial information (purchase price, operating cost), risk reduction (i.e. extended warranty), and financial capacity (i.e. low-cost loans), with 10 choice cards presented. Measures of environmental literacy, financial literacy, and socio-demographic factors are also presented.

The preliminary results show that energy rating, low-cost loans, and extended warranty had a positive impact on appliance selection. **Participants were more likely to select appliances with more efficient ratings, higher interest rates, and longer warranty terms. However, loan term was observed to be negatively associated with appliance selection, indicating a preference for shorter repayment windows.**

The analysis of consumer-specific factors revealed that environmental and financial literacy did not significantly impact the effects of informational frames, although financial knowledge was negatively associated with loan terms. Socio-demographic groups did not have a broad impact on sensitivity to informational frames, although age was positively associated with loan terms and household income was positively associated with warranty length.

In summary, the study highlighted key factors that support appliance selection and offered clear avenues for future energy label development.

The results provide valuable insights for policymakers and stakeholders in the energy efficiency and appliance industry. For example, the following initial policy recommendations can be made to enhance the adoption of efficient residential appliances:

- **Enhanced financial incentives:** Governments and financial institutions should consider offering more attractive low-cost loan options to encourage consumers to invest in efficient appliances. This could

include subsidies, tax incentives, or low-interest loan programs specifically targeted at energy-efficient home appliances.

- **Extended warranty programs:** Manufacturers and policymakers should consider promoting extended warranty programs for efficient appliances. This could provide consumers with added confidence in the durability and longevity of these products, potentially increasing their appeal. In 2023, the European Commission adopted a proposal on common rules promoting the repair of goods. These rules would allow consumers to have more accessible and cost-effective options to repair technically repairable products (such as vacuum cleaners, and in the near future, tablets and smartphones) once the legal guarantee has expired or when the product is no longer functioning due to wear and tear<sup>25</sup>.
- **Consumer education:** There is a need for targeted educational campaigns to improve consumer awareness of the long-term cost savings and environmental benefits associated with efficient appliances. This could involve public information campaigns and educational programs focused on the financial and environmental advantages of investing in energy-efficient products.
- **Labelling and information:** Energy labels and product information should be clear, easily understandable, and prominently displayed at the point of sale to help consumers make informed choices. The study's findings suggest that these informational frames have a positive impact on appliance selection, and therefore, efforts should be made to ensure that consumers are well-informed about the benefits of efficient appliances.
- **Targeted marketing:** Manufacturers and retailers should consider targeted marketing efforts aimed at different demographic groups, such as older consumers or those with higher household incomes, to highlight the benefits of efficient appliances tailored to their specific needs and preferences.

By implementing these policy recommendations, governments, manufacturers, and other stakeholders can work together to accelerate the uptake of efficient residential appliances, leading to energy savings, cost reductions for consumers, and environmental benefits.

#### 4.3.5 The EVIDENT Serious Game

The relevant literature has examined various alternative methods to support behavioural change initiatives. One effective approach involves serious games, which utilize gaming elements in educational or skill development activities, rather than solely for entertainment purposes. In their literature review, Delemere and Liston (2022) found that serious games provided positive effects, with an average decrease

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<sup>25</sup> For more information see [https://commission.europa.eu/law/law-topic/consumer-protection-law/consumer-contract-law/rules-promoting-repair-goods\\_en](https://commission.europa.eu/law/law-topic/consumer-protection-law/consumer-contract-law/rules-promoting-repair-goods_en)

in energy usage of 9.9% in public and educational environments, 18.4% in commercial environments, and 15.2% in residential environments.

As part of the EVIDENT project, a serious game has been created and is currently being used to gather data, as well as to offer direct guidance on energy efficiency behaviours to the players (<https://evident-h2020.eu/seriousgame/>). The serious game replicates a setting that simulates daily routines and presents the player with a range of decisions related to household energy consumption and management. For example, players can view and interact with the essential temperature control in the house and turn off lights in a room. An indicative example of the EVIDENT serious game is shown in Figure 19.



Figure 19: Example of the EVIDENT serious game (<https://evident-h2020.eu/seriousgame/>)

The player's objective is to minimize energy consumption, leading to higher scores at the end of the game. Throughout the game, players must decide whether to repair or replace malfunctioning appliances. When choosing to replace, players select from devices with varying characteristics related to energy consumption (e.g., energy label), purchase and operating costs, and more. The EVIDENT serious game aims to examine how decisions about household appliance replacement or repair are influenced by environmental, energy, and financial literacy across various resident types. Additional details on the serious game's design can be found in D2.3 – ‘Serious Game Implementation Design’.

Additionally, members of the public can use the EVIDENT ecosystem to create their own serious game that runs on the project's website, with the results stored on the EVIDENT platform<sup>26</sup>. Relevant links:

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<sup>26</sup> The EVIDENT online platform offers the capability to host tailored surveys and serious games from third parties at no cost. Additionally, it serves as a platform for information on energy efficiency, including policy briefs and relevant events, etc. <https://evident-h2020.eu/evidentplatform/>

- EVIDENT serious game <https://evident-h2020.eu/seriousgame/>
- EVIDENT platform: <https://evident-h2020.eu/evidentplatform/>
- Creating a Unity Game in the EVIDENT ecosystem (blog post) <https://evident-h2020.eu/unity/>

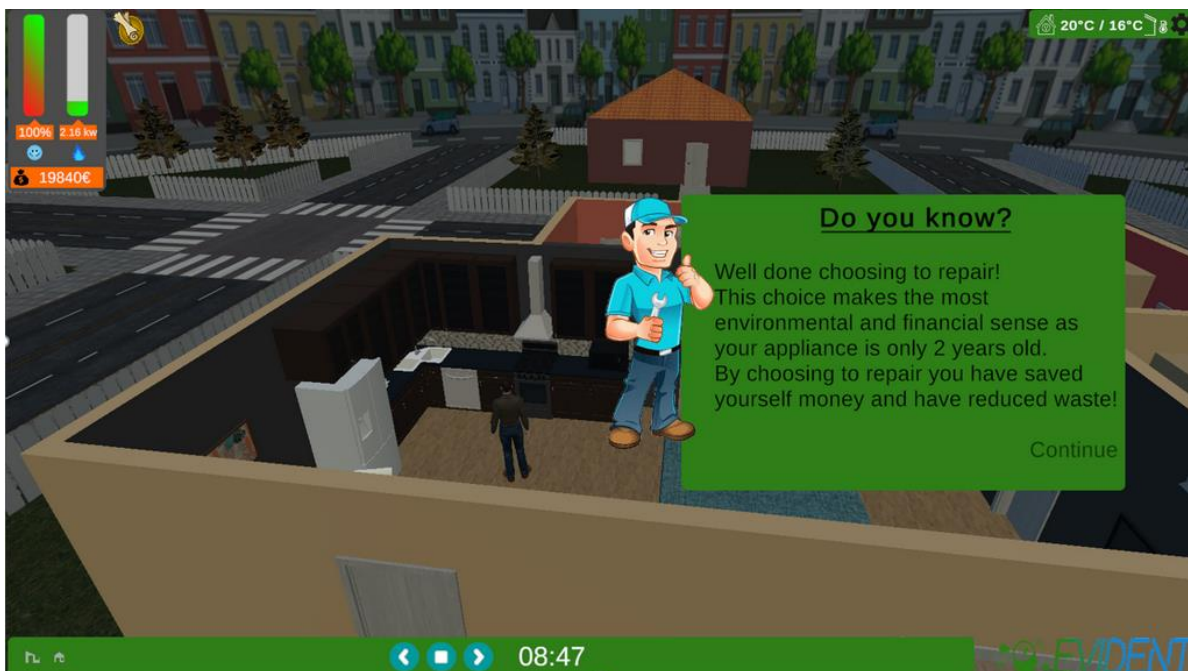
For a more technical overview of the EVIDENT platform, see Lytos et al. (2022).

#### 4.3.5.1 Preliminary results

The current scientific literature indicates that the financial literacy skills of end-consumers can have a substantial impact on their energy consumption behaviours and other energy-related decisions. The EVIDENT serious game aims to further investigate these correlations.

Five workshops (both online and in-person) were carried out in collaboration with community groups in August and September 2022 to assess user engagement and the usability of the serious game. Following the conclusion of each game, participants were also asked to complete a survey<sup>27</sup>. For more details on the utility and acceptability of the serious game, see Delemere and Liston (2024).

Despite its recent availability to the public, the serious game can already be used to promote energy efficiency by offering guidance to its participants and gathering data for scientific analysis. An example of a player receiving feedback about a choice they made is illustrated in Figure 20.



<sup>27</sup> For details on the survey see D3.2 - 'Implementation of preparatory actions for RCT, surveys and serious game.'

Figure 20: Example of affirmation of choices in the EVIDENT serious game

Regarding the data collected by the EVIDENT consortium, as of December 2023, our sample of respondents consists of approximately 900 participants, with an average age of 31 and an average household size of 2.4 adults. Most participants did not have children living with them and were either homeowners or tenants, had a household income of less than €50000, and were employed part-time. The participants were from a variety of European countries, with Greece, Italy, Spain, and Ireland being the most frequently represented.

In terms of participant engagement with the serious game, the majority opted to play the game on a web browser (approximately 83%), while the remaining participants used the EVIDENT serious game mobile app, while the average duration of play was approximately 52 seconds.

Overall, the study found **the participants generally have high levels of total environmental literacy and high environmental awareness, but lower levels of environmental knowledge and action.** It was also found that homeowners, landlords, and tenants had similar levels of environmental literacy. The study showed that different residential groups had similar scores in different aspects of environmental literacy. In what follows, we explore these first results in more detail.

**Environmental literacy:** The researchers looked at how where people live, their age, their income, and whether they work affect how much they know about the environment and how much they care about it. They found that people from different countries and with different incomes had different levels of environmental knowledge and attitudes. **They also found that older people were more likely to take action to help the environment.** Overall, where people live and how much money they have seem to have the biggest impact on their environmental literacy.

**Financial literacy:** The study found that the people surveyed generally had a high level of financial knowledge and were confident in their knowledge. They also had a high tolerance for taking financial risks. However, there were some differences in scores based on where people lived and their income and employment status. For example, people in Sweden had higher financial knowledge than those in Greece, and **people with higher incomes tended to have more financial knowledge.** Unemployed people and those with lower incomes also tended to have lower financial knowledge.

**Stated Preference – Choice 1:** The study involved presenting participants with a scenario where they had to choose whether **to repair or replace a broken appliance.** They were given options for different types of replacement appliances with varying energy efficiency ratings and prices. Most participants chose to replace the appliance with a more efficient one or to repair it. The study also looked at how factors such as age, employment status, and residential status influenced people's choices. For example, **older people and students were less likely to choose to repair the appliance, while those who were unemployed or seeking employment were more likely to choose repair.** Homeowners and landlords were more likely to choose a less efficient replacement, and students were less likely to do so. Age and residential status also influenced the likelihood of choosing a similarly efficient replacement appliance.

**Stated Preference – Choice 2:** Choice 2 was the same as Choice 1 but also **included information about the monthly cost to run each appliance.** This made people more likely to choose a more efficient appliance instead of repairing the old one. However, some individuals continued to make choices that



appeared to be financially inexplicable. Age, housing situation, and employment status also had an impact on people's decisions. **Overall, adding information about the financial consequences of their choices made people more likely to choose a more efficient appliance**, some individuals made choices that may not have been easily understandable.

**Willingness to pay for repair or replacement:** The study looked at people's willingness to pay for the repair or replacement of household appliances. Participants negotiated costs for repair or replacement based on their previous choices. **The results showed that tenants and landlords were willing to pay more for repairs compared to homeowners.** The study also found that household income, environmental attitudes, and financial knowledge had an impact on willingness to pay for repairs. **Notably, higher environmental attitudes were related to lower willingness to pay for repairs, suggesting that environmental concerns alone may not drive behaviour change.** The study also found mixed effects for other aspects of environmental literacy and financial knowledge on willingness to pay for repairs.

When available, the full results will be published in other EVIDENT reports, and scientific publications.

#### 4.3.5.2 Policy implications

Some resulting high-level policy recommendations include:

- Develop targeted environmental education programs for different age groups and income levels: Tailor educational materials and programs to address the specific environmental knowledge and attitude gaps identified in the study. For example, create age-appropriate environmental literacy programs for different age groups and design financial literacy workshops targeting unemployed individuals and those with lower incomes to improve their decision-making skills.
- Implement financial literacy programs: Collaborate with financial institutions and community organisations to offer financial literacy workshops and resources, with a focus on improving financial knowledge and skills for making sustainable financial decisions. These programs should particularly target unemployed individuals and those with lower incomes to empower them with the necessary financial knowledge.
- Create policies to incentivise the purchase of energy-efficient appliances: Work with policymakers to develop and implement incentives such as tax credits, rebates, or subsidies for the purchase of energy-efficient appliances. This can encourage sustainable consumer choices and contribute to environmental conservation efforts.
- Design communication strategies to highlight the long-term financial benefits of energy-efficient appliances: Develop targeted communication campaigns that emphasise the cost savings and long-term financial advantages of choosing energy-efficient appliances. This can help consumers make informed decisions that align with their financial interests while also supporting environmental sustainability.

- Tailor repair and replacement policies: Develop policies that accommodate the preferences and financial capabilities of different residential groups. This could include subsidies or financial assistance programs specifically tailored to tenants and landlords to support repairs and replacements of household appliances.
- Conduct further research: Invest in further research to understand the complex relationship between environmental attitudes, financial knowledge, and willingness to pay for repairs or replacements. This research can provide insights to inform targeted interventions and policies that effectively address the diverse factors influencing consumer behaviour.

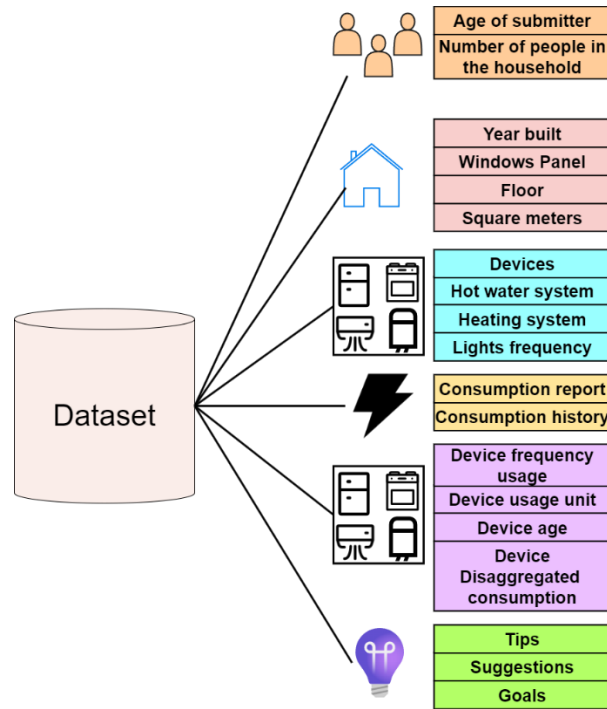
#### 4.3.6 Understanding consumption behaviour through energy recommendations

In April 2022, PPC S.A. launched a platform for promoting energy conservation ('My energy coach', <https://www.dei.gr/en/home/myenergy/myenergycoach/>). This campaign aims to promote energy conservation through consumption feedback, provide relevant tips, and help set energy consumption goals, through a user-friendly interface (Figure 21).



Figure 21: 'My energy coach' (PPC S.A.)

This activity evaluates the effectiveness of energy conservation prompts and aims to increase consumer awareness of energy usage. A household dataset is used to understand energy consumption patterns and offer practical advice for more efficient electricity use (Figure 22). Data filtering and pre-processing techniques to refine the dataset were implemented to address the challenges of data completeness and accuracy.



**Figure 22: Overview of dataset. Colour coding: demographic data - orange, blue and the red fields; energy recommendations – green; quantitative data - yellow and purple fields**

Previous methods using machine learning struggled with interpreting categorical data, thus, a new methodology focused on quantitative data was introduced. This revised approach emphasises the impact of energy recommendations on consumption patterns.

‘My Energy Coach’ offers personalised recommendations to PPC S.A. residential clients, aimed at changing their habits to be more eco-friendly when using household devices such as heat pumps and stove hobs. These recommendations are provided in the form of ‘tips’, ‘suggestions’, or ‘goals’. Initial findings show that ‘tips’ and ‘goals’ have a significant positive impact, at least in the short term. However, ‘suggestions’ have not yet proven to be effective, as they often involve replacing a device or taking more high-level actions that consumers are unlikely to immediately follow. Additionally, participants in the 35-44 and 45-55 age brackets, with 3 to 4 members in their household, are more likely to follow the ‘tips’ provided.

From the initial results, it can be argued that energy recommendations can indeed affect consumer behaviour and energy consumption patterns. Through machine learning algorithms and demographic analysis, the research identifies key factors influencing consumer adherence to recommendations, such as age and household size. **The results show that personalised energy-saving plans work well and it is important to set realistic goals. Making an easy-to-use computer interface also helps people get involved and make informed choices.** In the future, it is suggested to keep studying and improving energy-saving plans to better help diverse groups of people and make energy efficiency even better.

In short, the initial main policy suggestions are:

- Implement personalised energy-saving plans for residential clients, focusing on realistic goals and easy-to-use interfaces.

- Continue studying and improving energy-saving plans to better help diverse groups of people and make energy efficiency even better.
- Focus on quantitative data analysis and machine learning algorithms to interpret energy consumption patterns and improve the effectiveness of energy recommendations.
- Target specific demographic groups, such as those in the 35-44 and 45-55 age brackets, with personalised energy-saving recommendations.
- Emphasise the importance of data completeness and accuracy in refining household datasets for energy conservation campaigns.
- Evaluate and refine the effectiveness of diverse types of energy-saving recommendations, such as 'tips', 'suggestions', and 'goals', based on consumer adherence and impact on energy consumption patterns.
- Encourage consumer awareness of energy usage and promote energy conservation through consumption feedback and practical advice for more efficient electricity use.

#### 4.3.7 Other policy recommendations and implementations

Combining the above recommendations with those from EVIDENT research activities that have not yet been published, we can summarise some high-level policy recommendations:

- **Tailor support for younger age groups:** The research findings underscore the importance of implementing targeted policies and interventions to enhance environmental knowledge, skills, and actions among younger age groups. This could involve the development of educational programs specifically designed to address the unique challenges and knowledge gaps faced by younger demographics in relation to environmental literacy and sustainable energy decision-making. These initiatives should be focused on enhancing environmental awareness, skills, and knowledge, and promoting actionable steps towards sustainable practices.
- **Address financial knowledge gaps:** The identification of financial knowledge gaps among younger age groups, low-income households, unemployed individuals, and part-time employees highlights the need for comprehensive policies aimed at improving financial literacy and decision-making skills. Government-led initiatives and educational programs should be tailored to provide targeted support, resources, and training to enhance financial knowledge, particularly in the context of making sustainable appliance choices. By addressing these knowledge gaps, individuals can make more informed decisions when selecting energy-efficient appliances and managing their household finances.

- **Include monthly operational costs at the point of sale:** Government regulations and industry standards can be revised to mandate the inclusion of monthly operational costs of appliances at the point of sale. This policy initiative aims to ensure that consumers are presented with clear and comprehensive information about the long-term financial implications of their appliance choices. By making monthly operational costs more salient, consumers can better understand the ongoing financial impact of their appliance purchases, thereby enabling them to make more informed and sustainable decisions.
- **Individualise strategies based on demographics:** The research findings suggest the necessity of developing individualised strategies to address the discrepancies between younger and older cohorts in energy and financial informational frames. Policymakers should consider tailoring support based on demographic factors, such as age or employment status, to meet the specific needs of different consumer groups. By leveraging demographic insights, policymakers can design targeted initiatives to enhance energy investment opportunities for younger age groups and provide relevant support to address the unique challenges faced by specific demographic segments.
- **Design choice architecture for renters:** Policymakers should prioritise developing choice architecture policies and regulations that increase the salience of financial impacts and operational savings over shorter cost horizons for renters. By addressing the unique factors impacting energy decision making for renters, such as security of tenure, these policies aim to encourage investment in energy-efficient appliances and sustainable energy practices within rental properties. Such initiatives can empower renters to make informed decisions and contribute to energy savings, thereby benefitting both the environment and their personal finances.
- **Provide support for environmental literacy enhancement:** Given the findings regarding high direct rebound rates and the need to support consumers in evaluating choice information, policymakers should prioritise efforts to enhance environmental literacy. This could involve developing and implementing educational campaigns, resources, and programs aimed at improving environmental literacy among the general population. By increasing environmental awareness, knowledge, and skills, consumers can make more informed and sustainable appliance decisions, contributing to positive environmental and energy outcomes.
- **Focus on pro-environmental behaviours:** Policymakers should consider shifting the focus towards promoting actual pro-environmental behaviours rather than attitudes in isolation. The findings emphasise the need for policies that encourage and facilitate sustainable actions across various contexts. By designing initiatives that promote and incentivise pro-environmental behaviours, policymakers can drive positive changes in consumer practices and contribute to broader environmental conservation efforts.

- **Enhance financial knowledge for sustainable appliance decisions:** Efforts should be directed towards providing tailored knowledge and resources about the impacts of behaviour on finances, particularly for individuals in part-time work, job-seeking, and unemployed. By addressing these specific demographic segments, policymakers can leverage targeted support to empower individuals with the necessary financial knowledge to make more sustainable appliance decisions. This initiative aims to enhance consumer decision-making skills and promote sustainable practices, contributing to positive environmental and financial outcomes.

## 5. Key performance indicators

A performance indicator is a way to measure how well something is performing, and Key Performance Indicators (KPIs) are specific indicators that focus on the most important aspects of outputs or outcomes. The use of KPIs as a performance measurement system becoming increasingly popular across various industries (Chan and Chan, 2004).

In general, KPIs are proven metrics for evaluating and monitoring projects and can be quantitative or qualitative measures of the achievements of an activity, such as a research project like EVIDENT. KPIs are mandated in the Regulations governing both Horizon 2020<sup>28</sup> and Horizon Europe programmes<sup>29</sup>. An example of Horizon 2020 performance assessment can be seen in Figure 23. Other KPIs and performance metrics for both Horizon 2020 and Horizon Europe programmes can be found here: [Horizon Europe - Performance \(europa.eu\)](#)

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<sup>28</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R1291>

<sup>29</sup> <https://eur-lex.europa.eu/eli/reg/2021/695/oj>

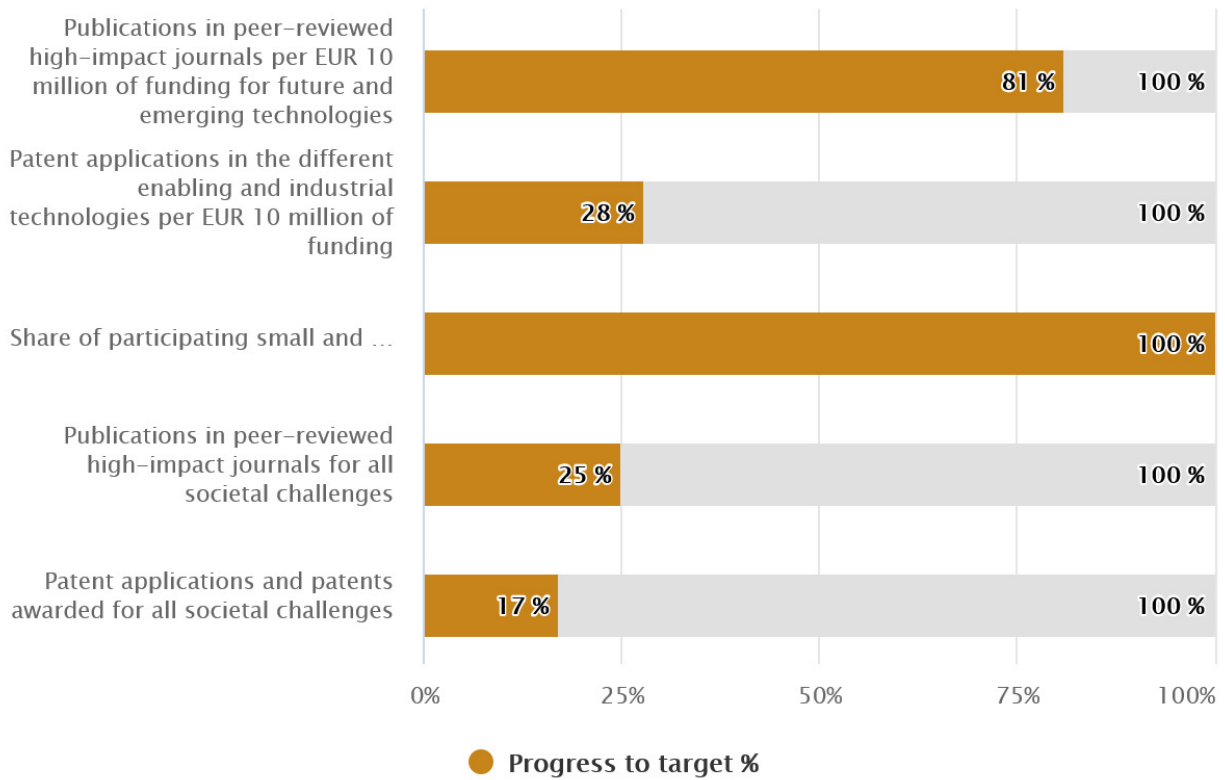


Figure 23: Horizon 2020 performance assessment<sup>30</sup>

## 5.1 KPIs for research projects

The application of KPIs in monitoring research projects can lead to greater accountability, productivity, and overall project success. KPIs offer a quantifiable measure of performance, and through strategic selection and regular monitoring, they can help determine the progress of Horizon projects towards their specific objectives. However, the effectiveness of this process is predicated on the accurate identification, selection, and monitoring of the KPIs.

Research projects such as EVIDENT and other Horizon projects, are typically extensive, encompassing a broad range of areas like research, innovation, science, and technology. Given their expansive nature and the vast sums of funding involved, it is critical to implement mechanisms that track, monitor, and evaluate

<sup>30</sup> Source: [https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/programme-performance-statements/horizon-europe-performance\\_en#mff-2014-2020--horizon-2020](https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/programme-performance-statements/horizon-europe-performance_en#mff-2014-2020--horizon-2020)



project performance. KPIs have been successfully employed in a variety of sectors, including research programmes and projects, as they can lead to:

- Improved project monitoring and evaluation: KPIs can enhance transparency and accountability, allowing for the effective utilisation of funds and resources.
- Increased project success: By tracking progress towards specific and quantifiable goals, the chances of successful project completion increase significantly.
- Improved decision-making: Updated data provided by KPIs can assist stakeholders in making informed decisions, especially for the reallocation of resources and modification of targets.
- Enhanced stakeholder engagement: Providing accurate and tangible information on monitoring and evaluation can increase trust amongst stakeholders.

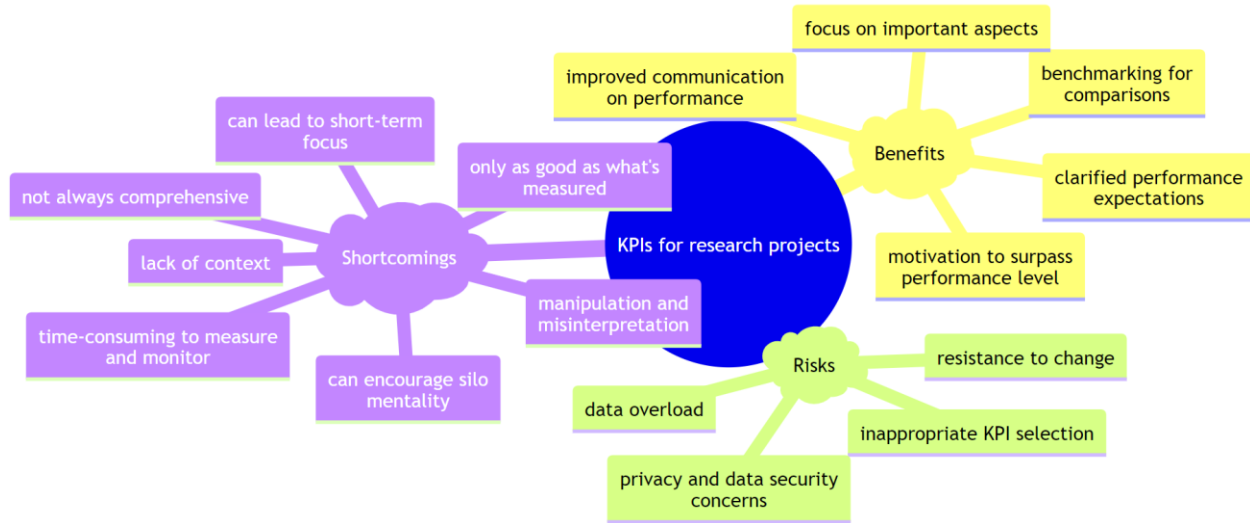
Additionally, KPIs have advantages over other metrics, such as:

- Focus: KPIs are typically more strategic and aimed at the overall goals of the project or organisation. In contrast, other metrics can be more operational, measuring the daily activities and processes.
- Purpose: KPIs are used to gauge performance against key business objectives. Other metrics, while also used to measure performance, are more typically used to track and improve day-to-day operations.
- Impact: Failing to meet a KPI can have significant strategic implications for a project or an organisation. Failing to meet other metrics may only affect a specific operation or process and may not have far-reaching consequences.
- Quantity: KPIs are fewer in number but of higher importance due to their strategic alignment. There might be hundreds of other metrics being tracked, each relating to different areas of the organisation or project.

For KPIs to be effective they must be 'SMART' which Doran (1981) defines as:

- **Specific** – target a specific area for improvement
- **Measurable** – quantify or at least suggest an indicator of progress
- **Assignable** – specify who will do it
- **Realistic** – state which results can realistically be achieved, given available resources
- **Time-related** – specify when the result(s) can be achieved

Various considerations regarding the KPIs of research projects are illustrated in Figure 24.



**Figure 24: An overview of KPIs for research projects**

However, it is important to note that KPIs also have potential shortcomings, including:

- **Inappropriate KPI selection:** Selecting irrelevant or unmeasurable KPIs could distort the actual project progress. Mitigation should involve engaging all stakeholders in the KPI selection process and ensuring the selected KPIs are indeed SMART.
- **Resistance to change:** As with any new initiative, there might be resistance from staff or stakeholders. It is necessary to provide effective communication about the benefits of KPIs, along with comprehensive training and support.
- **Data overload:** Too many, or complicated, KPIs may lead to confusion and dilute focus. Only the most relevant and critical KPIs should be chosen for each project.
- **Privacy and data security concerns:** The use of digital platforms for KPI monitoring can raise data privacy and security issues. It is essential to have robust data protection measures in place.

The following can guide the process of devising and selecting KPIs for a project:

- **Identification of KPIs:** It is essential to identify relevant KPIs that reflect the aims and objectives of each Horizon project. These KPIs should be SMART to ensure that they truly reflect the project's performance.
- **Integration into project planning:** KPIs should be integrated into the project planning phase. Project goals must align with selected KPIs, thus creating a results-oriented approach from inception.
- **Regular monitoring and evaluation:** KPIs should be regularly monitored and evaluated to provide insights on project progress. Regular reporting, ideally through a project dashboard, will keep stakeholders informed and assist in the early identification of issues.
- **Flexible KPIs:** While KPIs should be set at the beginning of the project, there must be a provision for them to evolve as the project progresses. Flexibility is necessary to reflect changes in project goals, resources, or the external environment.

- Stakeholder engagement: All relevant stakeholders, including funders, project participants, and beneficiaries, should be engaged in the KPI setting and monitoring process. This will ensure alignment of expectations and a clear understanding of the project's goals.
- Training and capacity building: Ensure project managers, task and work package leaders and other staff are competent in KPI selection, application, and analysis. This may require training and capacity-building initiatives.

A step-by-step guide would include:

- Setting up a taskforce: Assign a taskforce to conduct the initial groundwork, including identifying appropriate KPIs for each project, determining the tools and technology needed for monitoring and evaluation, and developing an implementation plan.
- Training and development: Arrange a series of training sessions for project managers and teams involved in Horizon projects. These sessions will be aimed at equipping them with the knowledge and skills needed to set, monitor, and evaluate KPIs effectively.
- Project initiation and integration: Incorporate the identified KPIs into each project from the start. This should be done during the project planning phase, with each KPI closely aligned to the specific objectives of the project.
- Developing monitoring mechanisms: Create a robust monitoring mechanism, such as a digital dashboard, to provide real-time updates on KPIs. This should be accessible to all relevant stakeholders and provide clear, visually engaging representations of data.
- Regular review and adjustment: Set up periodic review meetings to evaluate the progress of the KPIs and make necessary adjustments. This could be monthly,

In summary, KPIs are a subset of metrics that are aligned specifically with the activity's goals and objectives. They represent the most critical measures of performance towards these goals. They often track strategic performance and progress towards long-term goals; hence they are usually fewer in number but of higher importance. KPIs are often tied to key business outcomes, and they are used to make strategic decisions.

## 5.2 The EVIDENT Key Performance Indicators

The EVIDENT project is being carried out as part of the European Union's Horizon 2020 research and innovation program which requires projects to establish monitoring and reporting procedures. For example, there is a monitoring of compliance with submission deadlines set in the EVIDENT project's Grant Agreement. At the time of drafting this report, all planned deliverables had been submitted in time. Furthermore, the achievement of objectives and milestones is also monitored.

The progress of the EVIDENT project is monitored through several channels including:

- General Assembly meetings (plenary meetings)
- Work package meetings
- Progress reports: the first report has been, while the second is due within 2024
- Periodic reports: the first report has been approved
- **Monitoring and achieving key performance indicators (KPIs)**

Other indirect means of monitoring progress include:

- Events and exploitation activities: <https://evident-h2020.eu/project-material/>
- Scholarly publications: <https://evident-h2020.eu/publications/>
- EVIDENT blog posts (see Figure 25): <https://evident-h2020.eu/posts/>
- The deliberations of various EVIDENT entities such as the Impact Creation Board, and the Technical Management Committee
- Interactions with the External Advisory Board Members
- Other information is included on the project’s website: <https://evident-h2020.eu/>



Figure 25. Examples of EVIDENT blog posts (<https://evident-h2020.eu/posts/>)

The EVIDENT KPIs facilitate the evaluation and monitoring of the impact, performance, and added value of the project. KPIs offer a summary of the project's progress and the performance of each consortium partner involved in the project.

The KPIs for the EVIDENT project and their threshold values are derived from the use cases and communication activities, and many of them are specified in the project’s Grant Agreement. These KPIs are quantitative and are designed to measure the project’s impact on various stakeholders. The EVIDENT KPIs are grouped as follows:

- Dissemination activities and relevant KPIs envisaged by the EVIDENT project.

- The EVIDENT use cases.
- Communication activities of the EVIDENT project.

The tables in the following subsections summarise the EVIDENT KPIs and the status of achievement.

### 5.2.1 EVIDENT dissemination KPIs

The dissemination KPIs include the number of publications and appearances in technical and mainstream media, on-site demonstrations and workshops, conference papers, and others.

Table 2 provides a summary of the KPIs related to the dissemination activities, presenting the indicators, the planned values by the end of the project, and the current values (as of publication). From Table 2 it is clear that **the EVIDENT project has already met all its relevant dissemination KPIs**, while both research and dissemination activities are ongoing.

For example, workshops co-located with major conferences have been successful, with the project organising 5 workshops and achieving the target number of participants in each workshop. Additionally, presentations in conferences, workshops, and similar activities have exceeded the planned values, with over 500 participants engaged in these events.

On-site demonstrations have met the target of at least two demonstrations, while the project consortium has also conducted serious game demonstrations, focus groups, and demonstrations in several events.

In terms of academic publications, the project has successfully met its target by publishing 5 conference papers and 4 workshop papers. The project has also achieved the planned target for journal papers, with 5 papers published and 3 under publication.

The project's social media presence has been strong, with over 200 EVIDENT posts, and a total of 1250 followers/contacts across various platforms. The project has also exceeded the planned values for likes/reactions and comments on social media shares.

The project has also been active in online publishing, with over 20 posts, more than 500 views, and 5 media appearances, meeting the planned values for these KPIs.

Moving forward, the project is focused on maintaining its positive momentum and expanding the reach of its results. This includes a focus on increasing the number of reads for EVIDENT news in blogs and websites targeting non-specialised audiences, as well as expanding media appearances to reach a wider audience.

**Table 2: Summary of dissemination KPIs**

KPI	Indicators (target values)	Planned Values (by project end)	October 2022	21 February 2024
<b>Workshops co-located with major conferences</b>	Number of workshops organised (1-2 per year on average) and Number of participants in each workshop (~50)	5	1	<b>Presentations in conferences, workshops, and similar activities: 12</b> <b>Participants: &gt; 500</b>
<b>On-site demonstrations</b>	≥ 2 demonstrations	2	0	<b>Serious game demonstrations, focus groups and demonstration in several events: 9</b>
<b>Conference papers</b>	Number of conference papers published (1-2 per year on average)	5	0	<b>Conference papers: 5</b>
<b>Targeting workshops</b>	Number of workshop papers published (1-2 per year on average)	4	1	<b>Presentations in workshops for the promotion of the project's findings: 5</b>
<b>Journal papers</b>	Number of journal papers published (1-2 per year on average)	5	0	<b>Journal papers published: 5</b> <b>Under publication: 3</b> <b>Book chapters: 1</b>
<b>Social networks posts, to take advantage of modern communication channels for wider dissemination</b>	Number of EVIDENT posts (≥10), Number of contacts (≥100), Number of likes (≥ 50 likes / share), Number of comments (≥2 com. / share)	<i>Posts: &gt; 60</i> <i>Followers/Contacts: &gt; 400</i> <i>Likes/reactions: &gt; 110/share</i> <i>Comments: &gt;5 share</i>	Posts: 60 (Twitter), 28 (Facebook), 28 (LinkedIn) Followers/Contacts: 580 (total) Likes/reactions: 160/share Comments: 1/share	<b>Social media posts: &gt; 200</b> <b>Followers/Contacts: &gt; 1250 (total)</b> <b>Likes/reactions: &gt; 200</b> <b>Comments/mentions: &gt; 25</b>
<b>Participation and/or Attendance at exhibitions</b>	Number of project brochure copies delivered (≥20)	>20	30	<b>&gt;40</b>

Project web site	Top 5 Search Engine Page Ranking (SEPR)	Top 5 Search Engine Page Ranking (SEPR)	N/A	N/A
<b>Summer schools / open events with free access</b>	Number of summer schools / # of attendees ( $\geq 1$ / $\geq 50$ ) Number of open events ( $\geq 1$ )	1	Summer schools: 0 Open events: 1	<b>Summer schools: 1</b> <b>Open events: 7</b> <b>Total number of attendees: &gt; 40</b>
<b>Online publishing (online magazines, newspapers, blogs)</b>	$\geq 5$ publications / year $\geq 500$ views	Posts: > 20 Views: > 500	Posts: 5 News/events: 18 Newsletters: 2 Views: 368	<b>Blog posts: 17</b> <b>Videos: 2</b> <b>Online newspapers: 4</b> <b>Views: &gt; 800</b>
<b>Inclusion of light content for the non-specialised audience in the project website, blog, and social media, as well as publishing 'lighter versions of project newsletters, leaflets, flyers, etc.</b>	Number of non-specialised material $\geq 5$	8	Blog posts: 5 Newsletters: 2 Videos: 2 Leaflets/flyers: 4 Presentation materials: 5 Total: 18	<b>Blog posts: 16</b> <b>Newsletters: 2</b> <b>Videos: 2</b> <b>Leaflets/flyers: 4</b> <b>Presentation materials: 6</b> <b>Total: 30</b>
<b>Participation in media (TV, newspapers, radio) events to communicate results of the project and explain its benefits to EU citizens, industry etc.</b>	Number of media appearances $\geq 5$	5	Online newspapers: 2	<b>Online newspapers: 5</b>
<b>EVIDENT news will appear in blogs and websites targeting non-specialised audience, especially the youngest one, focusing on technology news and trends.</b>	Number of reads $\geq 100$	Reads: > 500	Reads: 4250	<b>Reads: &gt; 5000</b>

### 5.2.2 EVIDENT KPIs per use case

Table 3 below provides a monitoring of the EVIDENT KPIs per use case, as they are defined in the project's Grant Agreement. Overall, the progress on the Key Performance Indicators (KPIs) for the various use cases is promising with ongoing research and initiatives showing potential.

For Use Case 1, which focuses on estimating the importance of consumption feedback in residential users in Greece and Sweden, the percentage of residential energy saving induced by behavioural insights in Sweden has already exceeded the planned value. While the number of participants is currently approximately 300, a new intervention is expected to be initiated in the coming months, which is anticipated to significantly increase participation. The same holds for Use Case 2, which estimates the relative effectiveness of interventions like peer comparison feedback in Greece and Sweden

Use Case 3, which focuses on the role of big data in assessing the impact of behavioural insights on energy consumption in Sweden, is ongoing, and the research is in progress. Although the planned values for the KPIs have not yet been met, the project is actively working toward the set goals.

Use Case 4, which examines the relation of energy consumption behavioural biases with consumers' financial literacy level in Greece and Sweden, has made progress, particularly in initiating collaborations with national or international organisations for promoting energy efficiency. The number of participants has reached 1029, which exceeds the planned value of over 1000.

Finally, Use Case 5, which aims to exploit energy demand curves in Greece and Sweden, has seen noteworthy progress in terms of the number of participants, reaching 2220 compared to the planned value of over 2500. The project has also made strides in initiating collaborations with national or international organisations to promote energy efficiency.

**In summary, while there have been some challenges in meeting the planned values for the KPIs, there is ongoing research and initiatives in place that show promise in meeting and potentially exceeding the planned values.** The project is actively working to increase participation and achieve the planned values, which is crucial for the success of the initiatives. Efforts are also being made to improve the understanding of the informational material and to continue the impact estimation of the interventions.



**Table 3: EVIDENT KPIs per use case**

Use Case	KPI	Planned Values (by project end)	October 2022	January 2024
<b>Use Case 1:</b> Estimate the importance of consumption feedback in residential users - Greece & Sweden	National campaigns for promoting energy consumption reduction based on behavioural insights	> 2	0	0
	Initiate collaborations with national or international organisations for promoting energy efficiency	> 2	0	0
	Percentage of residential energy saving induced by behavioural insights	> 4% by treatment group	Estimation is pending	<b>approx. 20% in residences with more than 150 sq.m size</b>
	Percentage of users' understanding the informational material	> 85%	Estimation is pending	Estimation is pending
	Number of participants	> 10000	Ongoing	Approx. 300. In the next months a new intervention will significantly increase the number of participants.
	<b>National Campaign Details</b>			
<p>In Greece, PPC initiated In April 2022 a platform (My energy coach) that promotes energy conservation. The purpose of the campaign is to promote energy conservation through consumption feedback, relevant tips, and set energy consumption goals.</p> <p>In Sweden, a campaign based on sending HERs to consumers promoting energy efficiency was initiated in December 2021 through the project's partner CW. The purpose of the campaign is to promote energy efficiency through consumption feedback, and relevant tips.</p>				

	Number of consumers reached	<p>Greece: Through PPC's client network more than one million customers were reached. The number of customers that enrolled in the platform is more than 180000 customers.</p> <p>Sweden: 500 consumers were reached (treatment group) and eventually will reach 1000 customers.</p>		
<b>Use Case 2:</b> Estimate the relative effectiveness of interventions like peer comparison feedback – Greece & Sweden	National campaigns for promoting energy consumption reduction based on behavioural insights	> 2	0	0
	Initiate collaborations with national or international organisations for promoting energy efficiency	> 2	0	0
	Percentage of residential energy saving induced by behavioural insights	> 4% by treatment group	Estimation is pending	<b>approx. 20% in residences with more than 150 sq.m size</b>
	Percentage of users' understanding the informational material	> 85%	Estimation is pending	Estimation is pending
	Number of participants	> 40000	Ongoing	Approx. 300. In the next months a new intervention will significantly increase the number of participants.
<b>Use Case 3:</b> The role of big data in assessing the impact of behavioural insights in energy consumption. (Sweden)	National campaigns for promoting energy consumption reduction based on behavioural insights	> 2	0	0
	Initiate collaborations with national or international organisations for promoting energy efficiency	> 2	0	0
	Indicators for energy consumption patterns by demographic groups related to big data (i.e., are any differences between	> 3	0	Ongoing

	demographic groups in peak time energy consumption)			
	Number of participants	> 300	0	<b>approx. 400</b>
<b>Use Case 4:</b> Relation of energy consumption behavioural biases with consumers' financial literacy level. (Greece & Sweden)	National campaigns for promoting energy consumption reduction based on behavioural insights	> 2	0	<b>3</b>
	Initiate collaborations with national or international organisations for promoting energy efficiency	> 2	0	<b>3</b>
	Correlation indicators between behavioural biases and financial literacy	> 2	0	<b>3</b>
	Policy actions for energy consumption reduction based on financial literacy results	> 2	0	<b>3</b>
	Number of participants	> 1000	0	<b>1029 participants completed the Serious Game</b>
<b>Use Case 5:</b> Exploit energy demand curves. (Greece & Sweden)	National campaigns for promoting energy consumption reduction based on behavioural insights	> 2	0	<b>3</b>
	Initiate collaborations with national or international organisations for promoting energy efficiency	> 2	0	<b>4</b>
	Indicators of efficiency of various policy actions promoting energy efficiency (i.e., free installation costs for energy-efficient devices, rebates)	> 3	0	<b>7</b>
	Number of participants	> 2500	56	<b>2220</b>

### 5.2.3 EVIDENT KPIs related to communication activities

The description of the EVIDENT project communicates its scope, methods, data, results, news, achievements, etc., through several channels. These are described in D7.1 - 'Project communication kit' and include social media accounts, promotional material, such as leaflets and posters, as well as the project's website.

The communication tools used in the context of the project, as well as the respective metrics that evaluate the impact, are presented in D7.2 - 'Report on dissemination and impact assessment' and D7.3 - 'Update on dissemination and impact assessment report', D7.4 - 'Exploitation and market analysis report', and D7.5 - 'Update on exploitation and market analysis report'.

In the following subsections, we provide a brief overview of some relevant metrics.

#### 5.2.3.1 Publications

As of January 2024, EVIDENT has published about:

- 25 deliverables, <https://evident-h2020.eu/deliverables/>
- 10+ scientific publications (journals and conferences), <https://evident-h2020.eu/publications/>
- several datasets and other materials on the Zenodo open access repository, e.g., <https://zenodo.org/records/7825986>
- 16 blog posts, <https://evident-h2020.eu/posts/>
- the EVIDENT serious game and platform, <https://evident-h2020.eu/seriousgame/>
- newsletters, leaflets, posters, etc., <https://evident-h2020.eu/newsletters/>

EVIDENT was also featured in several media articles, for example (non-exhaustive list):

- June 2020. Online article. General description of the EVIDENT project, and presentation of its objectives. Discussion regarding the PPC infrastructure and how it is incorporated into the project's use cases (blog post in Greek). <https://ypodomes.com/evident-to-ereynitiko-programma-toy-kdep-dei-poy-deichnei-to-dromo-pros-tin-kainotomia/>
- June 2020. Article on an on-line news site. Description of the EVIDENT project, discussion about its role in industry 4.0 environment and internet of things (IoT) ecosystems (blog post in Greek). <https://ecopress.gr/kdep-dei-stin-proti-grammi-tis-evropaikis-energikis-kenotomias/>
- 15 November 2022. **CORDIS** journalists covered the EVIDENT project in a news article was published on the CORDIS website in six languages. [https://cordis.europa.eu/article/id/442567-new-game-to-increase-energy-literacy-among-consumers?WT.mc\\_id=exp](https://cordis.europa.eu/article/id/442567-new-game-to-increase-energy-literacy-among-consumers?WT.mc_id=exp)
- 30 January 2024. Article in an online newspaper. <http://tinyurl.com/5n7tbr74>

#### 5.2.3.2 Television news program

On 27 February 2024, the project coordinator gave an interview in the Greek television news program 'Perimetros'. The interview was focused on the EVIDENT serious game and its potential implications for assisting consumers to adopt energy-efficient behaviours.

### 5.2.3.3 EVIDENT on social media

In addition to the EVIDENT website (<https://evident-h2020.eu/>) which also includes blogs (<https://evident-h2020.eu/posts/>), the project has dedicated social media accounts on:

- Facebook: <https://www.facebook.com/people/Evident-H2020/100068141126075/>
- LinkedIn: <https://www.linkedin.com/company/74626407/>
- Twitter<sup>31</sup> <https://twitter.com/EvidentH2020>

Using social media is encouraged for EU-funded R&I projects for both communication and dissemination, as they can ‘reach an extremely wide – but also targeted – audience maximising the impact and successful exploitation of [...] research results’<sup>32</sup>. Here we focus on the EVIDENT Twitter account while more information on the projects’ social media strategy and metrics can be found in EVIDENT D7.1, D7.2, and D7.3. An example is provided in Figure 26.



#### Evident - H2020

@EvidentH2020

EVIDENT is #EU funded #H2020 project that promotes #energyefficiency by investigating #behaviouralbias of individuals’ decision making in energy consumption.

1,714 Following 1,023 Followers

Figure 26. EVIDENT on Twitter (<https://twitter.com/EvidentH2020/>)

Table 4 depicts the Twitter communication KPIs as registered in May 2023 and included in D5.1. Since EVIDENT’s Twitter account has evolved into a major dissemination channel for the project, the consortium opted to closely monitor its performance. Till May 2023, the project has a successful social media presence and is followed by 977 accounts. EVIDENT has posted 122 tweets, measuring over 4200 impressions in the last two years. Further, the project’s Twitter page had over 4400 profile visits and 21 mentions during 2023. We should note that Twitter measures *impressions* throughout only last two years; while profile visits and mentions are measured for the current year (2023).

<sup>31</sup> To avoid confusion and for consistency, we use the name ‘Twitter’ which was the name of the company when the described activities occurred.

<sup>32</sup> European Commission, Directorate-General for Research & Innovation. Social media guide for EU funded R&I projects. [https://ec.europa.eu/research/participants/data/ref/h2020/other/grants\\_manual/amga/soc-med-guide\\_en.pdf](https://ec.europa.eu/research/participants/data/ref/h2020/other/grants_manual/amga/soc-med-guide_en.pdf)

**Table 4. Communication KPIs of the EVIDENT’s Twitter channel (as of May 2023)**

KPIs until May 2023	May 2023
<b>Followers</b>	977
<b>Tweets</b>	122
<b>tweet impressions (last 2 years)</b>	> 4200
<b>Profile visits (2023 only)</b>	> 4400
<b>Mentions (2023 only)</b>	21

Between May 2023 and end of January 2024, EVIDENT continued to gain followers and impressions, as can be seen in Table 6. In total, the project’s account is followed by 1210 users/accounts, while the consortium has posted 161 tweets, measuring over 5100 impressions. Further, the project tweeter page had over 6000 profile visits and more than 25 mentions.

**Table 5. Communication KPIs of the EVIDENT’s Twitter channel (as of January 2023)**

KPIs until end of January 2024	Jan. 2024
<b>Followers</b>	1210
<b>Tweets</b>	161
<b>tweet impressions (last 2 years)</b>	> 5100
<b>Profile visits (2023 only)</b>	> 6400
<b>Mentions (2023 only)</b>	> 25

An example of EVIDENT’s social media activities is the information campaign launched on 10 February 2023 with the aim to:

- raise awareness for the importance of energy efficiency to the public
- provide energy-saving tips to minimise energy consumption in the EU, and,
- reach out to policymakers and regulators for energy-related issues.

Table 6 depicts the progress of this campaign in terms of KPIs associated with the project’s Twitter channel till May 2023. The information campaign was a success and the EVIDENT consortium achieved over 2030 impressions in 22 tweets, within 4 months.

**Table 6. Communication KPIs of the EVIDENT’s energy-awareness information campaign**

Total tweets	Total tweet impressions	Retweets
<b>23</b>	> 2030	22

#### 5.2.3.4 Dissemination events and workshops

The following list presents the dissemination events and workshops the EVIDENT project (co-)organised or participated in. As reported in D5.1, up until June 2023 EVIDENT had (co-)organised or participated in about 21 events/workshops and through them, reached an audience of at least 1.300 people. Between June 2023 and January 2024, EVIDENT participated in or organised at least another three events reaching more than 300 people. What follows is a non-exhaustive list of events where EVIDENT participated or (co-)organised.

##### **Presentation to the Centre of Innovative Human Systems**

- Date: 29 April 2021
- Location: Online
- Attendees: 18 researchers and students
- Description: Presentation of the EVIDENT project and illustration of the achieved progress. Discussion about energy efficiency, serious games, and financial literacy.
- Link: <https://www.tcd.ie/cihs/>

##### **EU Researchers Night Workshop**

- Date: 22 September 2021
- Location: Online
- Attendees: 20 researchers from different disciplines
- Description: During START2021, an interactive workshop took place to present the EVIDENT project and collect input and perspectives on various project elements. Participants received an introduction to energy efficiency, serious games, and engaged in interactive exercises and conversations.
- Link: <https://www.tcd.ie/research/start/evident.php>

##### **International Conference on Environmental Psychology (ICEP)**

- Date: 06 October 2021
- Location: Online
- Attendees: More than 60 researchers and policy makers
- Description: A presentation was given on the combined impact of social norms in promoting energy conservation. The EVIDENT research design, goals, policy objectives, and next actions were also discussed.
- Link: <http://icep2021.com/>

##### **Presentation at 3<sup>rd</sup> Power and Gas Forum, Athens. Nudging consumers for energy efficiency**

- Date: 30 March 2022
- Location: Online
- Attendees: More than 60 policy makers, politicians, researchers, ministers, and industry members
- Description: Discussion about the revision of energy efficiency directive. Insights regarding the energy efficiency, behavioural insights, and nudging. Overview and use cases of the EVIDENT project.
- Link: <https://powergassupplyforum.gr/forum-program/>

**Use Cases**

5 large scale use cases to

- Assess biases that impact decision-making
- Estimate interrelations between financial literacy and consumption behaviour
- Estimate the impact of specific policy behavioural-based interventions.

Use Cases	Design
1: Estimate the importance of consumption feedback in residential users	RCT
2: Estimate the relative effectiveness of interventions like peer comparison feedback	RCT
3: The role of big data in assessing the impact of behavioural insights in energy consumption	Survey & data mining
4: Relation of energy consumption behavioural biases with consumers' financial literacy level	Serious Game
5: Exploit energy demand curves	Stated Preference Survey

**Paul Liston**  
Centre for Innovative Human Systems, Energy College Dublin (ECS)

Figure 27. 3<sup>rd</sup> Power and Gas Forum, Athens, Greece

### Exploring the impact of behavioural interventions and policy measures on energy efficiency (EU Sustainable Energy Days)

- Date: 28 June 2022
- Location: Online
- Attendees: 20 researchers from different disciplines
- Description: The EVIDENT consortium instigated a discussion about the energy consumption of households aiming to contribute to the discourse regarding the impact of behavioural interventions on energy efficiency.
- Link: <https://eusew.eu/energy-days/exploring-impact-behavioural-interventions-and-policy-measures-energy-efficiency>

**EXPLORING THE IMPACT OF BEHAVIOURAL INTERVENTIONS AND POLICY MEASURES ON ENERGY EFFICIENCY**

**EVIDENT**

**SUSTAINABLE ENERGY DAY ORGANISERS**  
Going green and digital for Europe's energy transition  
#EUSEW2022

European Commission

Figure 28. EVIDENT workshop: Exploring the impact of behavioural interventions and policy measures on energy efficiency

Rising



- Date: 08 August 2022
- Location: Ireland
- Attendees: 12 people from the wider public
- Description: EVIDENT serious game usability workshop.
- Link: <https://risingdublin.ie>

#### **Dublin Climate Action Week - South Dublin County Council**

- Date: 14 September 2022
- Location: Online
- Attendees: 9 people from the wider public, 1 local authority
- Description: EVIDENT serious game usability workshop.
- Link: <https://www.fingal.ie/news/dublin-climate-action-week-officially-launched>

#### **Dublin Climate Action Week - Fingal County Council**

- Date: 15 September 2022
- Location: Online
- Attendees: 8 local authorities
- Description: EVIDENT serious game usability workshop.
- Link: <https://www.fingal.ie/news/dublin-climate-action-week-officially-launched>

#### **An Taisce**

- Date: 21 September 2022
- Location: Ireland
- Attendees: 9 people from the public
- Description: EVIDENT serious game usability workshop.
- Link: <https://www.antisce.org/>

#### **START2022**

- Date: 27 September 2022
- Location: Online
- Attendees: 100 people from the public
- Description: EVIDENT serious game usability workshop.
- Link: <https://www.start-ern.org/programme>



Figure 29. EVIDENT at START2022

### START2022

- Date: 30 September 2022
- Location: Ireland
- Attendees: 100 people from the public
- Description: EU researchers' night event, outdoor stall set up with information on EVIDENT, and associated use cases Open event, no specific attendee number. Public, researchers, and students.
- Link: [https://www.tcd.ie/news\\_events/events/event/european-researchers-night---start-2022.php](https://www.tcd.ie/news_events/events/event/european-researchers-night---start-2022.php)

### 5<sup>th</sup> Annual Conference of the Centre of Behaviour Analysis, Queens University Belfast

- Date: 02 December 2022
- Location: Online
- Attendees: 40 Researchers, students, and academics
- Description: Presentation on the use of behavioural science to support energy behaviour change, with the EVIDENT serious game presented as a case study.

### Presentation at Electron H2020 clustering event

- Date: 06 December 2022
- Location: Hybrid
- Attendees: 200-250 researchers, academics, policymakers, entrepreneurs, and professionals
- Description: Presentation of the EVIDENT project, motivation, and early results.
- Link: <https://electron-project.eu/baku-event-agenda/>

### TCD Sustainability Strategy and Action Plan Open Consultation event

- Date: 13 December 2022
- Location: Ireland
- Attendees: 50 students, and scientists
- Description: TCD shared information about the quasi-experiment within EVIDENT use case 5.

### School of Psychology, TCD Research Symposium

- Date: 07 March 2023
- Location: Ireland
- Attendees: 60 Researchers, students, and academics

- Description: In-person event. Presentation on energy behaviour change and the EVIDENT project as part of a session on 'Decision Making in the Climate Crisis' within the School of Psychology Research Symposium.

#### **Trinity Sustainability Research Network Event**

- Date: 21 March 2023
- Location: Ireland
- Attendees: 30 Researchers, students, and academics
- Description: In-person event. Presentation on the EVIDENT project, with a focus on the serious game.

#### **Guest lecture, MSc in Environmental Economics, Amsterdam School of Economics, University of Amsterdam**

- Date: 03 April 2023
- Location: The Netherlands
- Attendees: 20 students, and academics
- Description: In-person event. Presentation of the EVIDENT project, with a focus on the policy implications, and the survey.

#### **7<sup>th</sup> International Conference on Applied Theory, Macro and Empirical Finance**

- Date: 11 April 2023
- Location: Greece
- Attendees: 30 researchers and scientists
- Description: In-person event. Presentation of the Use case 3 of the project with a focus on how policymakers can harness the heterogeneity in household energy for conservation planning.
- Link: <https://amef.uom.gr/>

#### **EU Open Door event**

- Date: 06 May 2023
- Location: Brussels
- Attendees: 500-600 participants
- Description: In-person event. The serious game created by EVIDENT, which delves into consumer behaviour when faced with a malfunctioning home appliance, was introduced. Participants were able to play the game and provide feedback to the consortium.
- Link: [https://cinea.ec.europa.eu/news-events/events/cinea-eu-open-door-event-2023-brussels-2023-05-06\\_en](https://cinea.ec.europa.eu/news-events/events/cinea-eu-open-door-event-2023-brussels-2023-05-06_en)

#### **EVIDENT summer school**

- Date: 04 July 2023
- Location: Greece
- Attendees: 10-14 participants
- Description: Summer school organised by the EVIDENT project
- Link: [https://ithaca.ece.uowm.gr/summer\\_school\\_2023\\_cppl/#](https://ithaca.ece.uowm.gr/summer_school_2023_cppl/#)



Figure 30. The 2023 EVIDENT summer school

### Europe Day 2023 - Journée de l'Europe 2023

- Date: 09 May 2023
- Location: Luxembourg
- Attendees: 200-300 participants
- Description: In-person event. The consortium talked with participants regarding the scope, the achievements, and the outcomes of the project.
- Link: [https://eurohpc-ju.europa.eu/events/europe-day-2023-journee-de-leurope-2023-2023-05-09\\_en](https://eurohpc-ju.europa.eu/events/europe-day-2023-journee-de-leurope-2023-2023-05-09_en)

### EU Sustainable Energy Days 2023

- Date: 12 September 2023
- Location: Online
- Attendees: 44 researchers, people from energy communities, and academics
- Description: EVIDENT came together with sister projects, energy communities, researchers, and academics to discuss behavioural change in energy efficiency.

## 6. Summary

In this deliverable, the EVIDENT project was presented, including its purpose, methodologies, progress, and initial findings. It also provided the first insights for policymakers, presented the EVIDENT use cases, and shared preliminary results.

The preliminary results serve to shape our initial recommendations to policymakers at different levels. For instance, the findings indicate that offering customized HERs to residential consumers can lead to a decrease in consumption, while also meeting specific requirements of the recast Energy Efficiency Directive, which is relevant for both European and national level policymakers.

We also highlight targeted behavioural interventions that can be incorporated into the National Energy and Climate Plans (NECP) of Member States. The EVIDENT use cases are purposefully designed to be replicated and, thus, be included as such in the NECPs.

Regional and local policymakers can use the EVIDENT serious game, or design their own through the EVIDENT platform. The serious game is already available for promoting energy efficiency, as it offers practical guidance to participants while gathering data for scientific analysis.

Overall, the EVIDENT online platform offers the chance to host tailored surveys and serious games from external parties at no cost. Additionally, it serves as a platform for sharing information on energy efficiency, including policy briefs, pertinent events, and more.

The EVIDENT project's progress was presented, including the methods used and the KPIs to track the progress. More results and policy recommendations will continue to be provided through EVIDENT reports and deliverables, publication of scientific papers, presentations at scholarly and policy conferences, policy briefs, through open repositories used by the project (e.g., Zenodo), and the project's website <https://evident-h2020.eu/>

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