



DELIVERABLE 6.12

Report on the Eco-Bot dissemination activities Version 3

RISA
November 2021

www.eco-bot.eu



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D6.12: Report on the Eco-Bot dissemination activities Version 3

Summary

This document has been prepared in the context of Task 6.2: "Eco-Bot dissemination activities" and aims to present the dissemination and communication activities that have been carried out by the consortium partners during the final phase of the project, i.e., during the months M29-M45 (February 2020 – June 2021).

DELIVERABLE NUMBER	WORK PACKAGE
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D6.12	WP6
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- ☒ PU = Public
- ☐ PP = Restricted to other programme participants
- ☐ CO = Confidential, only for members of the consortium

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List of Acronyms and Abbreviations

ACM: Association for Computing Machinery

ASEME: Spanish association of electricity companies

ASEW: German association of municipal utilities

CEO: Chief Executive Officer

CTO: Chief Technical Officer

CO: Confidential

DSO: Distribution System Operator

ESCO: Energy Service Company

EU: European Union

GEODE: European association of independent electricity and gas distribution companies

IFCS: International Federation of Classification Societies

KPI: Key Performance Indicator

NILM: Non-intrusive load monitoring

OEM: Original Equipment Manufacturer

PU: Public

SME: Small and Medium-sized Enterprise

UVP: Unique Value Proposition

WP: Work Package

Executive summary

This document describes the dissemination work carried out by the consortium partners during the months M29-M45 (February 2020 – June 2021) of the project in the context of Task 6.2: “Eco-Bot dissemination activities” of WP6: “Communication, Dissemination and Liaison Activities”.

The reporting period includes both the intermediate project phase (M29-M36) and the final project phase (M37-M45), with the former one involving system refinement based on the system usage findings and the user feedback received during the first part of the pilot phase, and the latter one focusing on the delivery of the final Eco-Bot version and its detailed evaluation and validation. In accordance with the “Dissemination strategy and action plan” (D6.2), during the intermediate phase of the project, emphasis was given on raising further awareness about Eco-Bot, engaging stakeholders more actively, and starting disseminating the first concrete project results, while, during the last phase of the project, dissemination and communication activities were further intensified.

Overall, the dissemination activities that have been performed during the reporting period as well as throughout the project's duration, are considered satisfactory and generally in line with the dissemination strategy and the initial plan, and in several cases the targets were overachieved, as, indicatively, the number of website visitors (7347 unique visitors while the target was 3500) and the number of Eco-Bot videos' views (706 with a target of 500), while a few minor deviations noted were mostly related to Covid-19 implications. It should be noted in addition that strong effort was put also towards the achievement of the additional targets defined in the revised version of D5.1, aiming to follow a more stakeholder-focused approach than initially foreseen, and although certain newly set targets were missed (e.g. 4 pilot-related newsletters were released instead of the 6 planned in D5.1), other newly set targets were overachieved (e.g. 50 pilot-related posts during the last period on social media instead of the 21 initially planned).

1 Introduction

This deliverable presents the dissemination work carried out by the consortium partners during the period M29-M45 (February 2020 – June 2021) of the project in the context of Task 6.2: “Eco-Bot dissemination activities”. The aim of the deliverable is to present the dissemination and communication activities that have been performed during the last 17 months of the project, and to evaluate the progress made against the Key Performance Indicators that were defined in D6.2: “Dissemination strategy and action plan”, as well as against the additional pilot-related KPIs that were defined in D5.1.

The deliverable is structured as follows:

- *Chapter 2* presents the strategic overview.
- *Chapter 3* presents the work carried out with regards to the preparation of new dissemination material.
- *Chapter 4* describes the dissemination and communication activities carried out during the period M29–M45.
- *Chapter 5* outlines the progress made in the dissemination activities, taking into account the action plan and the Key Performance Indicators.

2. Strategic Overview

Our dissemination strategy and action plan, which have been described in detail in D6.2, take into account the three main project phases in terms of work progress, namely the initial phase (M1-M28), the intermediate phase (M29-M36), and the final phase (M37-M45).

The reporting period includes both the intermediate project phase (M29-M36) and the final project phase (M37-M45), with the former one involving system refinement based on the system usage findings and the user feedback received during the first part of the pilot phase, and the latter one focusing on the delivery of the final Eco-Bot version and its detailed evaluation and validation. In accordance with the “Dissemination strategy and action plan” (D6.2), during the intermediate phase of the project, emphasis was given on raising further awareness about Eco-Bot, engaging stakeholders more actively, and starting disseminating the first concrete project results, while, during the last phase of the project, dissemination and communication activities were further intensified.

Moreover, the initial plan was updated and enriched with additional KPIs, defined in D5.1, aiming to follow a more stakeholder-focused approach during the last phase of the project. In the updated plan it was foreseen that pilot-related dissemination activities would be significantly strengthened and intensified so as to emphasise the dissemination of pilot findings and user testimonials, highlight Eco-Bot’s key advantages from the perspective of relevant stakeholders and how these stakeholder groups could benefit from it, thus maximising exploitation opportunities.

More specifically, as far as the dissemination and communication activities of Eco-Bot for the reporting period (M29-M45) are concerned, our action plan comprised the following:

- Creation of dissemination material
- Updating of the website
- Updating of social media accounts
- Publications in journals and participation in scientific conferences and workshops
- Participation in external events (exhibitions, trade fairs, forums, etc.)
- Organisation of Eco-Bot events
- Mass media activities
- Training and education activities

The following chapters present in detail the activities performed in relation to the above plan. It should be noted that the liaison activities with relevant stakeholders are described in D6.11 for the period M29 to M45 and the exploitation workshops organised by the consortium partners during the reporting period are presented in detail in WP7 deliverables.

3. Eco-Bot Identity and Dissemination Material


During the first 18 months of the project, as was presented in D6.3, timely actions were taken to create the Eco-Bot brand identity and dissemination material. These actions included the creation of the Eco-Bot logo and templates for the project deliverables, documents and presentations, as well as the creation of a project leaflet and a poster, both of which were updated after the replacement of BOTEGO with ERRA. Additional dissemination material that was created and disseminated during the period M19-M28, was presented in D6.4. This chapter presents the progress made during the last 17 months of the project (M29-M45) in the creation of new dissemination material.

3.1. Leaflets

The first leaflet of the project, to be used for distribution at all relevant key events as well as through the website, was produced on M8 and presented in D6.3. Moreover, as shown in D6.4, EYPESA produced in July 2019 (M22) an additional leaflet presenting Eco-Bot and their pilot, to be disseminated both online and in paper.

As far as the reporting period is concerned, SEC adapted the project leaflet in April 2020 (M31) to address end users and used it for user recruitment.

Figure 1 presents the layout and content of the leaflet produced by SEC.



HALLO, ICH BIN ECO-BOT!

Ich bin Ihr neuer Energieassistent und wurde entwickelt, um Ihnen beim Energiesparen zu helfen. Ich gebe Ihnen maßgeschneiderte Tipps, um Ihr Zuhause energieeffizienter zu machen. Ich bin mit dem Energiesparkonto verbunden und kann Ihnen jederzeit Auskunft zu Ihrem Stromverbrauch, Ihren Stromkosten und CO₂ Emissionen geben. Dazu tippen Sie einfach nur den gewünschten Zeitraum oder auch zwei Zeiträume zum Vergleich in mein Textfeld. Falls bei Ihnen ein Discovery Smart Meter installiert ist, kann ich Sie darüber hinaus über den Verbrauch und die Kosten einzelner Haushaltsgeräte informieren.

WAS ICH SONST NOCH FÜR SIE TUN KANN?

- Ihnen helfen, Ihre persönlichen Einsparziele, die sie mir vorher mitgeteilt haben, für einen bestimmten Zeitraum zu erreichen.
- Sie benachrichtigen, falls ich einen erhöhten Verbrauch feststelle
- Die Tage mit Ihrem geringsten und höchsten Verbrauch bestimmen
- Überprüfen, ob sich Energiesparmaßnahmen bezahlt gemacht haben
- Anhand des Verbrauchs bewerten, ob sich die Anschaffung eines neuen Haushaltsgerätes lohnt
- Die Vollkosten (Anschaffungskosten und Betriebskosten) verschiedener Haushaltsgeräte vergleichen

Das Eco-Bot-Projekt




Eco-Bot ist ein europäisches Projekt, an dem fünf Länder teilnehmen. Durch einen intelligenten Chat-bot, der mit einer Datenbank mit Empfehlungen verbunden ist, soll der Energieverbrauch in Haushalten und Unternehmen verringert werden. Mehr Informationen unter der Projekt-Homepage www.eco-bot.eu.

JETZT MITMACHEN!

SEnerCon ist Teil des Konsortiums und testet Eco-Bot als Applikation im Energiesparkonto www.energiesparkonto.de.

Wenn Sie am Projekt teilnehmen und Eco-Bot testen oder mehr über Eco-Bot wissen möchten, kontaktieren Sie uns gerne:

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Hochkirchstr. 11
10829 Berlin
ecobot@senercon.de

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Eco-bot partner











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Eco-Bot Förderung

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Die alleinige Verantwortung für diese Veröffentlichung liegt beim Autor. Die Europäische Union haftet nicht für die Verwendung der darin enthaltenen Informationen.

Hallo, ich bin Eco-Bot, Ihr neuer Energieassistent!

Hi Johannes!

Bisher haben Sie 100 kWh verbraucht

Ja, gerne!

Hi, wieviel Strom habe ich diesen Monat verbraucht?

Möchten Sie wissen, wie Sie Energiesparen können?





eco-bot
let's talk energy!

Figure 1: SEC's flyer for participant recruitment (front and back page)

Moreover, another leaflet was produced by adelphi in October 2020 (M37) to be used for Eco-Bot exploitation and dissemination workshops.

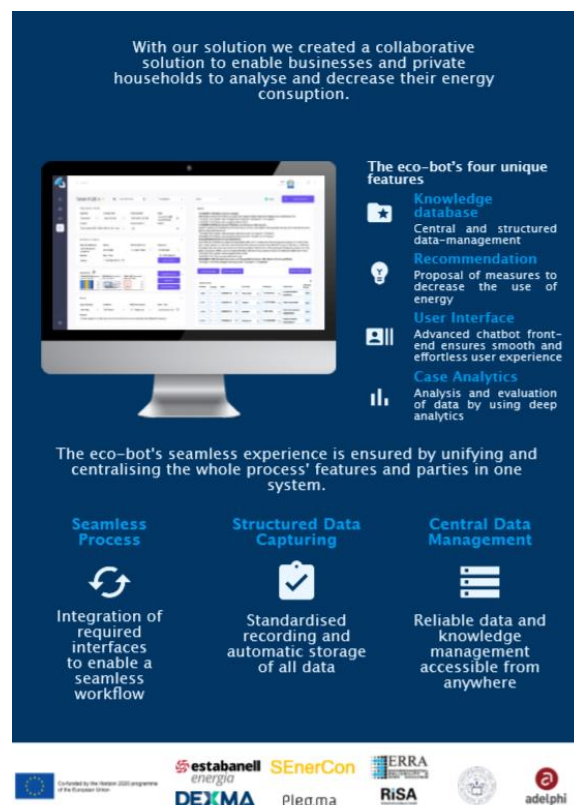
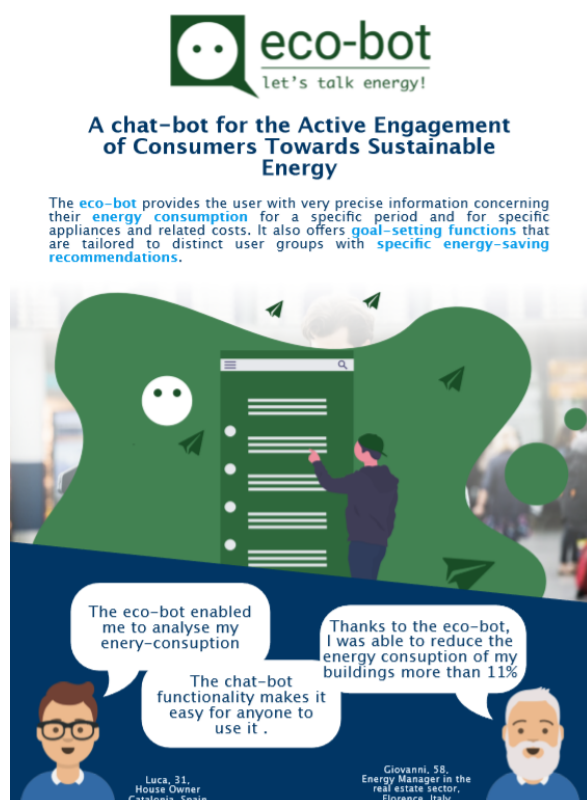


Figure 2: Eco-Bot leaflet (front and back page) for Eco-Bot exploitation and dissemination workshops

3.2. Newsletters

The first Eco-Bot newsletter was published in the end of January 2020 (M28) on the project's website and is available at: <http://eco-bot.eu/newsletter-1-introducing-the-eco-bot-project/>.

Following the second review, and in accordance with the reviewers' advice, instead of the initial plan to publish newsletters for general dissemination purposes, it was decided that it will be most beneficial in terms of exploitation to release newsletters that will address key audiences, i.e. the primarily targeted stakeholder groups. To this end, during the last phase of the project, user testimonials, success stories, pilot findings and other relevant information were used for preparing *stakeholder-targeted newsletters* that were published by the pilot partners, according to the updated action plan that was defined in the revised version of D5.1.

The newsletters that were published by the pilot partners are presented below:

SEC

SEC prepared two newsletters during the reporting period.

The first newsletter was prepared and published in October 2020 (M37) after the organisation of the stakeholder meeting with SEC's collaboration partner Discovery, the German consumer association of North Rhine Westphalia and DEnBAG, an energy auditor organisation that is running an energy portal. The newsletter informed on the meeting and its outcomes. During the meeting Eco-Bot as well as findings of the German pilot were presented and the application of Eco-Bot in other German energy platforms like Discovery was discussed as well as data protection issues that were most interesting for the consumer association.

+++Newsletter+++



What offers Eco-Bot and how can it be used by energy service providers in the future?

This question was the focus of a workshop with the smart meter metering service provider Discovery, the Deutsche Energie-Berater und -Auditoren Gesellschaft mbH DEnBAG and the Verbraucherzentrale NRW, which was organised by the German project partners of Eco-Bot, adelphi, RISA and SEnCon and the Greek partner ERRA in October.

The digital energy assistant [Eco-Bot](#), which is integrated in the interactive [Energy Savings Account](#) of SEnCon, was demonstrated live by ERRA. Its individual components, such as the evaluation of energy consumption at device level, the chatbot function and the model for dividing Eco-Bot users into user segments (e.g. environmentally or cost-conscious) were presented and it was explained which steps are necessary for the use of the components by other energy service providers.

First experiences with Eco-Bot as well as positive and constructive user feedback from the three pilot projects in Germany and Spain (EYPESA energy supplier and DEXMA energy monitoring platform operator for companies) were presented.

For the consumer association Verbraucherzentrale NRW, data security was important in the project, because the anonymized energy data of the users are evaluated and encrypted by various project partners in Greece, Scotland and Poland. This is done in accordance with the strict requirements of the European Data Protection Directive, which is described in the project's separate [data management plan](#).

Discovery shares the project objective "More energy efficiency through the use of digital tools in the energy sector" and is also participating in the "[Einsparzähler](#)" project with the same objective of the Federal Government. SEnCon and Discovery want to make even greater use of these synergies in the future. Discovery customers are currently testing Eco-Bot, and SEnCon has created an interface for the smart meter applied by Discovery in the energy saving account.

DEnBAG is developing an information and training platform on energy efficiency in companies, which bundles various offers on the market and is intended to contribute to increasing the quality of energy audits and energy efficiency in companies in general. A further development of Eco-Bot for industry, for example for applying it during an energy audit, would be interesting from DEnBAG's point of view and was discussed within the workshop.

The online workshop format was very successful, and further workshops on the use of Eco-Bot, for example by energy supply companies, are planned for the future.

Figure 3: SEC's first Eco-Bot Newsletter

The second newsletter published in February 2021 (M41) was summarising an interview with an Eco-Bot user that was organised on the 3rd of February 2021 about their experience with the bot.

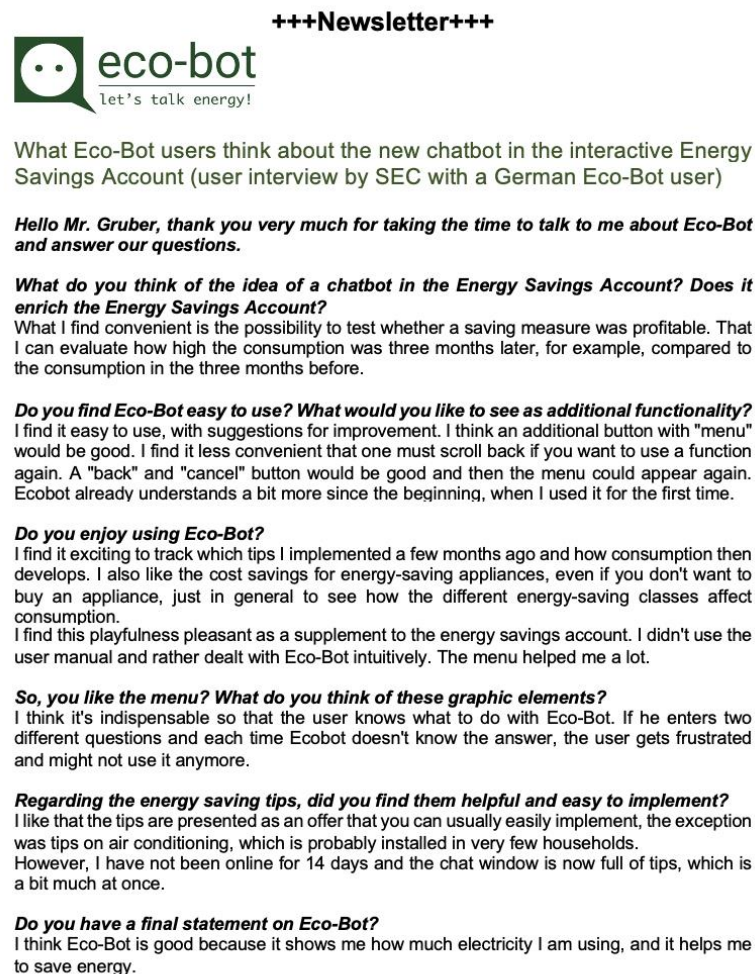


Figure 4: SEC's second Eco-Bot Newsletter

Both newsletters were published in German through SEC's business network and were translated into English (Figures 3 and 4) to disseminate them also on project level and on the project's website and Twitter account. The aim of both newsletters was to share stakeholders' views and end-users' experiences regarding Eco-Bot with interested energy service providers and other stakeholders.

EYPESA

EYPESA published a newsletter in December 2020 (M39). The aim of this newsletter was to promote Eco-Bot project and the service it offers among other stakeholders not participating in the project. As produced by EYPESA and mostly shared in their network, the main target audience were other utilities, DSOs and retailers in Spain and in the rest of Europe.

The newsletter consisted in a landing page, available at <https://eco-bot.estabanell.cat/newsletter-en>, which was composed by 4 different parts:

- 1) Eco-Bot at a glance (Figure 5)
- 2) The functionalities of Eco-Bot (Figure 6)
- 3) The motivation behind the use of Eco-Bot and its advantages (Figure 7)
- 4) Contact info (Figure 8)

A Spanish version was also created and can be found at: <https://eco-bot.estabanell.cat/newsletter-es>

An email was sent from EYPESA to all members of GEODE and ASEME associations, network of SME utilities at European and Spanish level, respectively. Furthermore it was shared on the social media of EYPESA and of the project and was sent to all consortium partners to further disseminate it to their own networks.

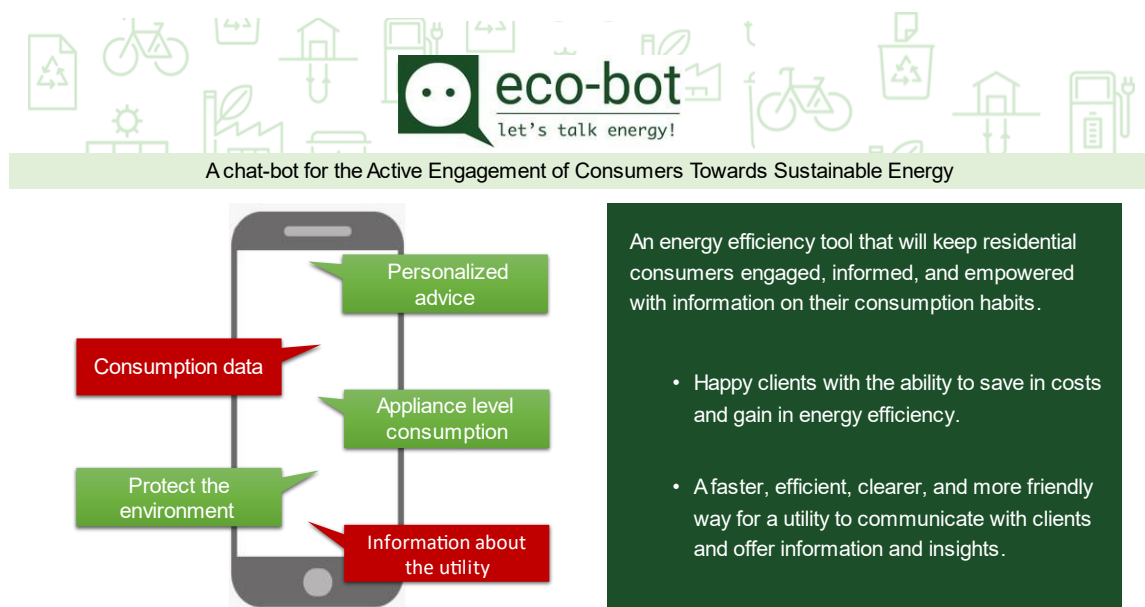
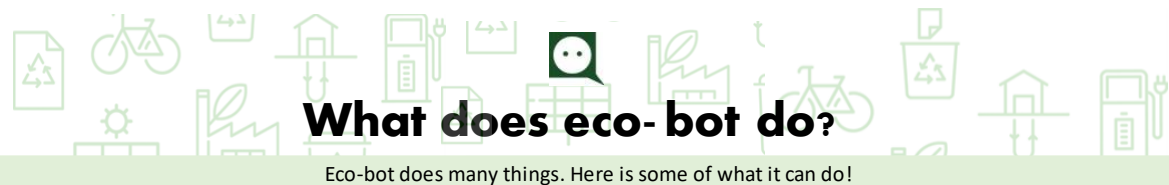


Figure 5: EYPESA's Newsletter – Eco-Bot at a glance



- Check their **consumption, cost, and impact** : being informed about consumption between any two days, its cost, and its environmental impact
- Know about the consumption of the main **appliances** at home to have a better indication of where a big part of their consumption is going
- Receive information on **procedures** that can be made with the company and how, without the person having to call or come to the office to inquire
- Receive **recommendations** on how they can become more efficient
- Receive customizable **notifications** about their consumption (for example when it has been especially high)



Figure 6: EYPESA's Newsletter – Eco-Bot functionalities

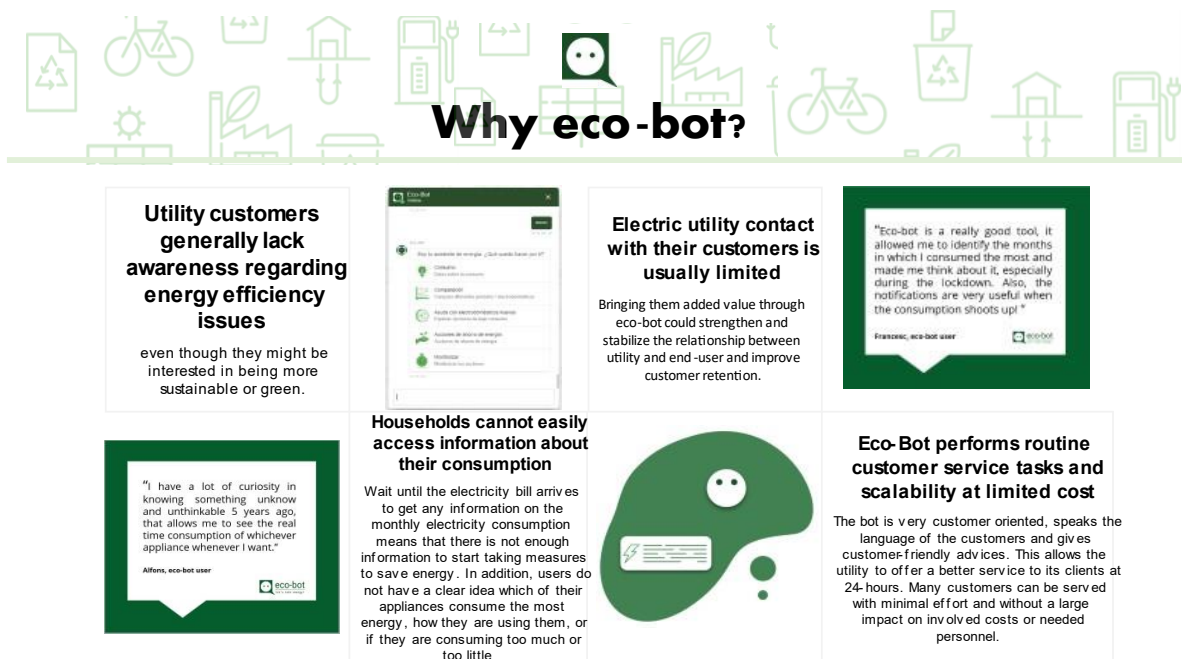


Figure 7: EYPESA's Newsletter – Advantages of Eco-Bot



Interested? Contact us!

	Eco-bot e-mail address info@eco bot.eu
	Coordinator's post adeses Xantener Straße 11 Berlin DE-10707
	Coordinator's phone number +49 30 3157060
	Coordinator's name Mr. Stephanos Camarinopoulos



An algorithms trained and tested in **various European locations** and continuously improving.

For more information you can visit the website: <http://eco-bot.eu/>



Co-funded by the Horizon 2020 programme of the European Union

Figure 8: EYPESA's Newsletter – Contact info

DEXMA

As described in D5.4, during the commercial pilot phase Eco-Bot was included in several periodical newsletters (Marketing Energy Flash newsletters in November 2020 and January 2021) sent by DEXMA's Marketing team to the more than 3000 subscribers, most of whom belong to Eco-Bot's targeted stakeholders (contacts from utilities, ESCOs and facility management companies). Apart from the Energy Flash newsletters, a more specific newsletter was sent in November 2020 (M38) to DEXMA's partners included in the Beta Tester programme. This programme involves more than 40 contacts from ESCOs that want to be the first ones to test new functionalities and are eager to give feedback. The newsletter sent to these specific potential stakeholders describes the chatbot, explains its benefits and also presents testimonials from real users.



eco-bot news

November 2, 2020 • Issue #1

Figure 9: DEXMA newsletter – Header

The First Energy Efficiency Chatbot in DEXMA

The aim of project Eco-Bot is to build an **energy efficiency chatbot** that can deliver personalised information and interactive virtual assistance.

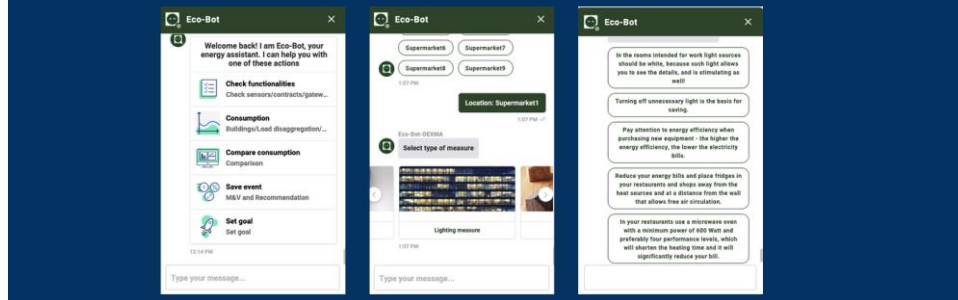


Figure 10: DEXMA's newsletter – Presentation

Benefits of using Eco-Bot

- Allows for **time saving** and efficiency through better **decision making**
- Reduces energy duties management to **1 h per week**
- Delivers constant legislation updates
- Enables **control at major KPIs** at a glance
- Allows **early problem detection**
- Offers various options for **push notification** intervals
- Facility Managers switch **from reactive to proactive**

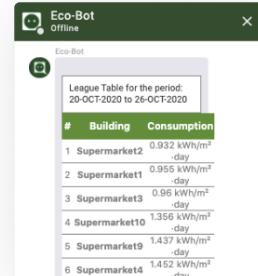
Figure 11: DEXMA's newsletter – Benefits of Eco-Bot

What do real users think about eco-bot? 🗣️

*"I would highlight the **location ranking according to its electrical consumption**. Since it is normalized by its surface, it gives the energy manager more accurate information"*

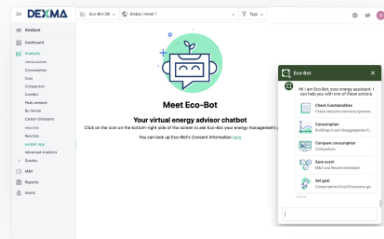


– Pinelopi Spyropoulou, Energy Manager at Justa Energia



#	Building	Consumption
1	Supermarket2	0.932 kWh/m ² day
2	Supermarket1	0.955 kWh/m ² day
3	Supermarket3	0.96 kWh/m ² day
4	Supermarket10	1.356 kWh/m ² day
5	Supermarket9	1.437 kWh/m ² day
6	Supermarket4	1.452 kWh/m ² day

"I think eco-bot is quite useful. It would be nice to have it as a pop-up function that you could use in other apps though, so whilst you are in the comparison app for example, you could still have that function overlaid, with the option to minimize or exit it"



– Connor McMenamin, Energy Data Analyst at Optimised Buildings

Figure 12: DEXMA's newsletter – Testimonials

Preliminary configuration

To be able to use Ecobot it is **mandatory**:

1. Reference meter assigned
2. Contracts configured
3. Carbon Emissions app configured
4. Receive real-time readings

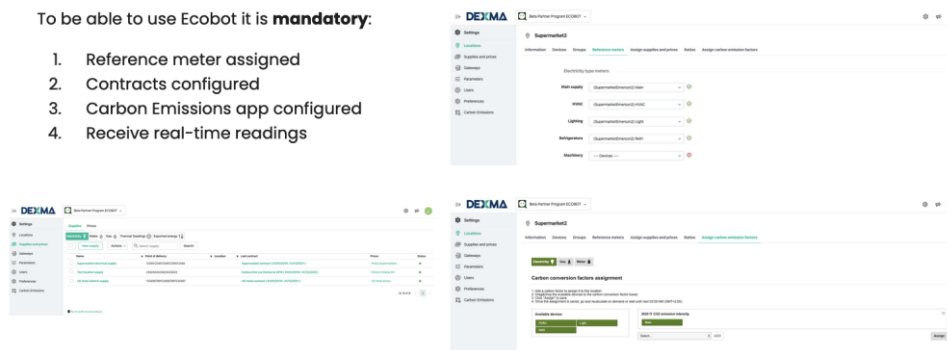


Figure 13: DEXMA's newsletter – Preliminary configuration

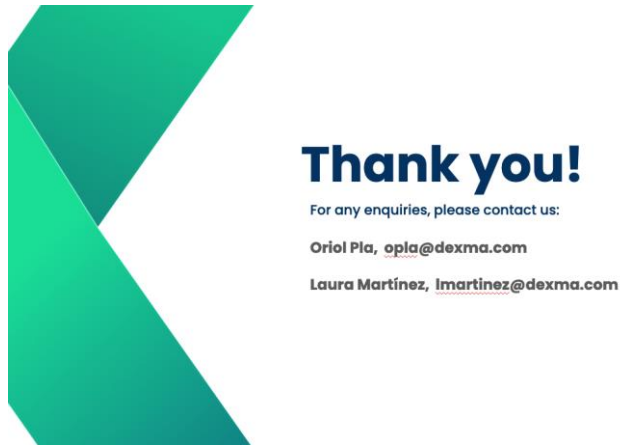


Figure 14: DEXMA's newsletter – Contact info

3.3. Videos

Our first Eco-Bot video (https://youtu.be/Yhg8s-K_WnQ) was produced in January 2020 and presented in D6.7: "Eco-Bot Video Version 1".

During the last phase of the project, five videos were produced. The videos are presented in D6.8: "Eco-Bot Video Version 2" and are the following:

USTRAT

Eco-Bot: How it works. Available at: <https://www.youtube.com/watch?v=9ssG6JSZC0w>

This "Eco-Bot: How it works" project video has been prepared for and streamed at the 5th International Workshop on Non-Intrusive Load Monitoring (<http://nilmworkshop.org/>) in conjunction with the ACM International Conference on Systems for Energy-Efficient Buildings, Cities and Transportation (BuildSys) on November 18 2020.

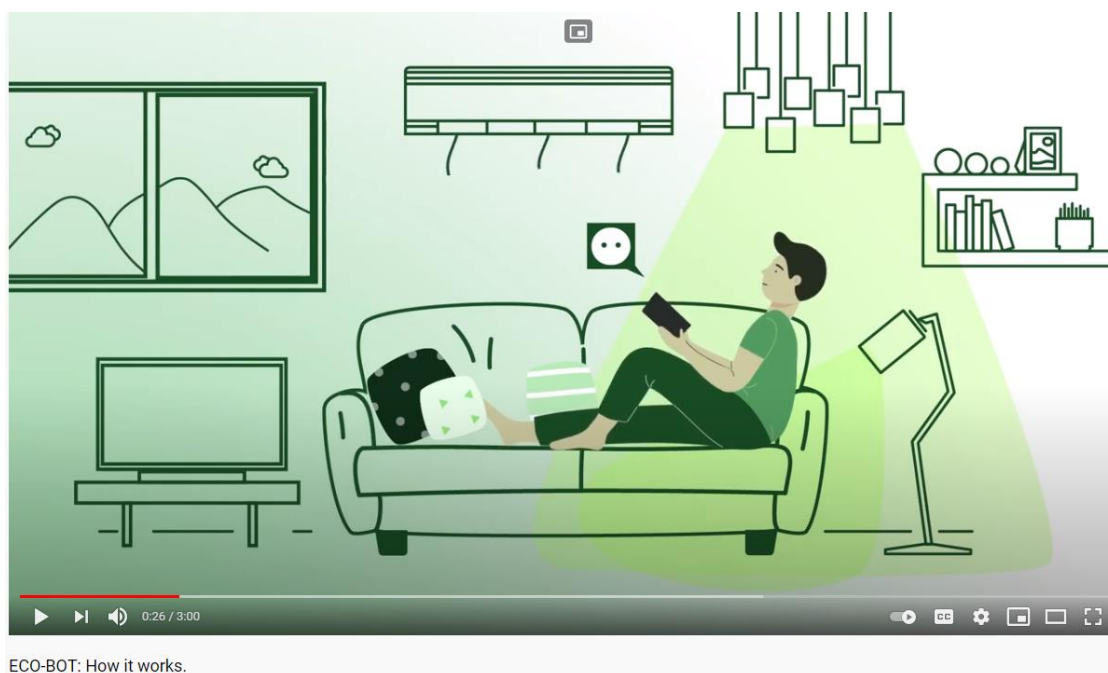


Figure 15: Example frame from the 'ECO-BOT: How it works' video

EYPESA

The Eco-Bot Spanish pilot. Available at: <https://www.youtube.com/watch?v=TjZn-p2bDYc>

Video produced by pilot partner EYPESA.

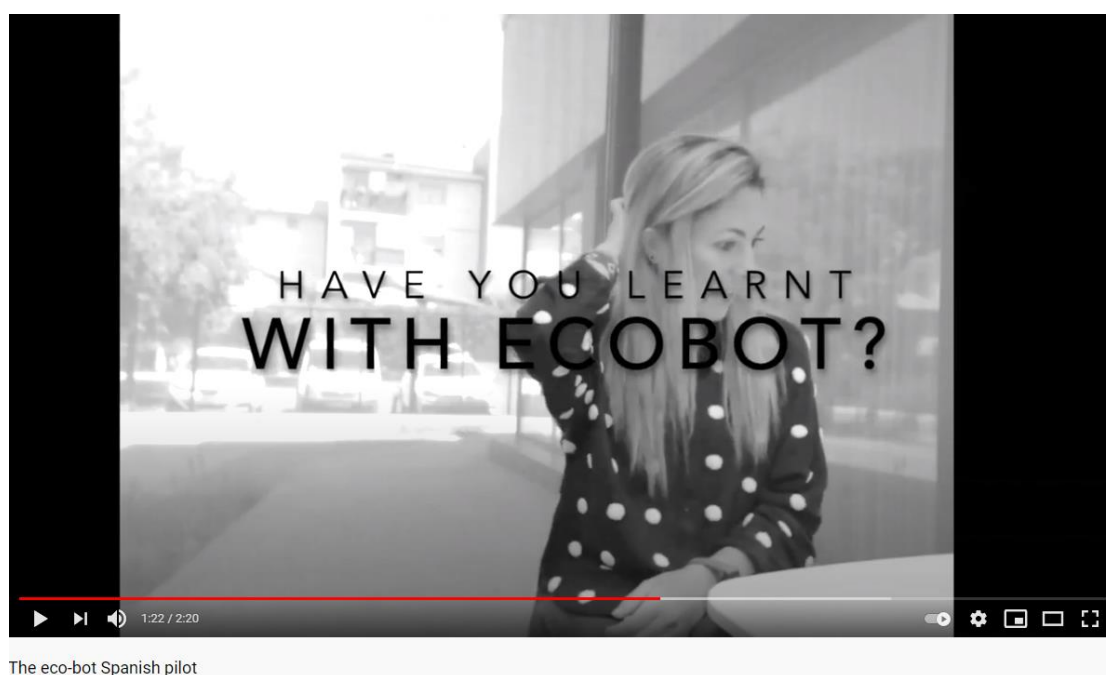


Figure 16: Example frame from the Eco-Bot Spanish pilot video

SEC

The Eco-Bot German pilot. Available at: <https://www.youtube.com/watch?v=sA3HD7H4Ps> and with English subtitles at: https://www.youtube.com/watch?v=su_ehwDocLM.

Video produced by pilot partner SEC.

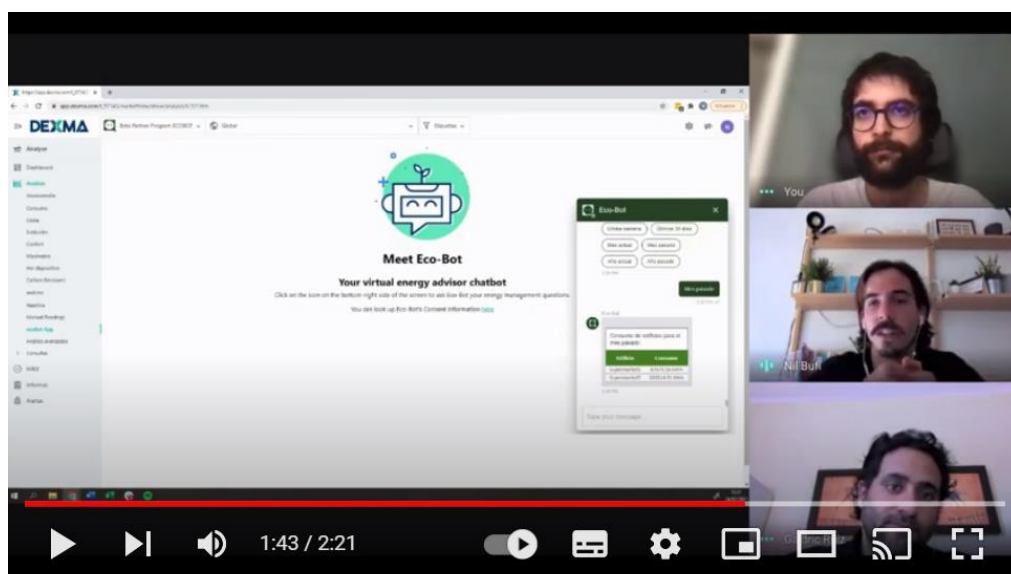


Figure 17: Example frame from the Eco-Bot German pilot video

DEXMA

The Eco-Bot commercial buildings pilot. Available at: <https://www.youtube.com/watch?v=KN1QxYRS800>

Video produced by pilot partner DEXMA.



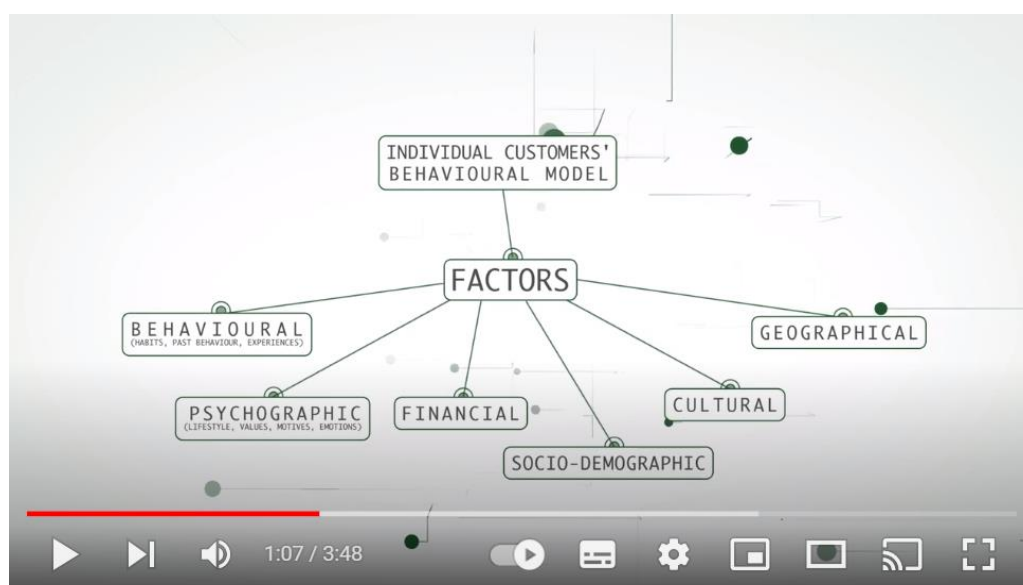
The eco-bot commercial buildings pilot

Figure 18: Example frame from the Eco-Bot commercial buildings pilot video

UEKAT

How Eco-Bot's behavioural model works. Available at: <https://www.youtube.com/watch?v=uGyFLIVjtQ>

This video was produced by UEKAT and was presented at the 5th edition of the Silesian Science Festival (<https://www.slaskifestiwalnauki.pl/o-festiwalu>), which took place on October 9-15, 2021.



How Eco-Bot's behavioural model works

Figure 19: Example frame from the 'How Eco-Bot's behavioural model works' video

4. Dissemination Activities

This chapter presents the dissemination activities that have been performed during the period from the beginning of February 2020 until the end of June 2021 (M29-M45).

4.1. Website

The Eco-Bot website (www.eco-bot.eu) was created in M2 with relevant project information and is constantly updated with project news and dissemination activities, publications, and public deliverables. It also provides direct links to the project's social media accounts. The website has been reformed and enriched in order to highlight achievements and competitive advantages, following a stakeholder-oriented approach. New sections have been added that provide pilot-specific, and consequently stakeholder-targeted information, thus supporting an exploitation-oriented approach.

Moreover, the landing page has been updated in order to address in a more direct way the CEOs and CTOs of the different stakeholder categories that have been identified and help them find out the specific Eco-Bot product offerings, by leading them through buttons to the brand-new dedicated webpages, serving as CEO and CTO pitches.

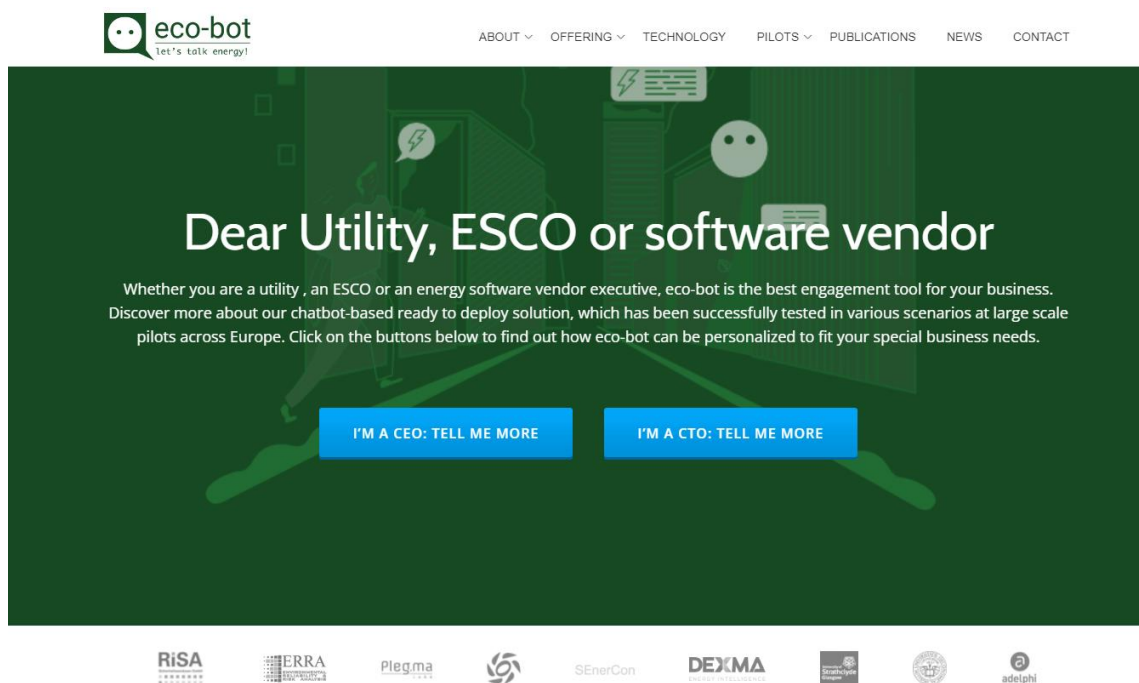


Figure 20: Eco-Bot website updated section in landing page

CEO PITCH

How eco-bot can be personalized for your special needs:

Utilities & ESCO CEOs

Stand out from your competition and generate additional value: build long-term relationships with your customers through a viable communication channel and use it to upsell new products or services.

Eco-Bot allows you to:

- Reduce the workload of your customer service and save money. Through Eco-Bot's interface you have a direct and automated line of communication with your customers.
- Deliver on your sustainability promises and help your customers save energy. Eco-Bot's ability to monitor consumption of specific appliances enables you to send tailor-made energy saving recommendations to your customers.
- Include features ("use cases") that you need. Eco-Bot's energy monitoring abilities and natural-language chat abilities can easily be customized to your company's needs and generate extra revenue for a small price/investment...

Software Vendor CEOs

Bind your customers to your service platform and create additional revenue through best supplying the easiest-to-use energy monitoring tool on the market.

Eco-Bot allows your customers to:

- Be more efficient and save time. Eco-Bot displays information on energy consumption and building performance KPIs on one unified and user-friendly page.
- Focus on technical visits, retrofit proposal or customer engagement using the valuable time savings facilitated by Eco-Bot
- Streamline their daily task. Eco-Bot enables facility managers to set automatic goals and alerts for energy-saving measures and recommendation follow-ups

Figure 21: Eco-Bot website – dedicated CEO pitch webpage

CTO PITCH

How eco-bot can be personalized for your special needs:

Utilities & ESCOs CTOs

Leverage state-of-the-art non-intrusive load monitoring and behavioural modelling with a natural dialogue chatbot to become the most innovative and user-friendly energy company.

Eco-Bot allows you to:

- Upgrade your service to offer a sophisticated load monitoring solution. Eco-Bot's NILM algorithms calculate the energy consumption of individual electrical appliances and combines them with Eco-Bot's advanced behavioural model, producing automated and individualised energy saving recommendations.
- Securely scale up to your needs. Eco-Bot's distributed system architecture is designed to scale on demand, allowing for stable network growth as well as easy third-party integration.
- Personalize your service without worrying about data security. Eco-Bot innovative data exchange protocol allows the bot to guarantee compliance to data protection regulations.

Software Vendors CTOs

Integrate Eco-Bot's powerful monitoring and communication components to your own software solution to become the most innovative energy software company on the market.

Eco-Bot allows you to:

- Take what you need. Eco-Bot's distributed system architecture is designed to let its individual components work independently from each other. Whether you need state-of-the-art non-intrusive load monitoring, advanced energy consumption behavioural modelling, a natural language chatbot, or all of these: Eco-Bot's components can be mixed and matched to supply exactly what your software solution needs.
- Scale up automated customization. The combination of Eco-Bot's components produces automated and individualised energy savings recommendations. The system's architecture is geared to achieve quick and stable network growth.
- Turn data security into one of your strengths. Eco-Bot's innovative data exchange protocol can be easily integrated and adapted to your solutions to guarantee compliance to data protection regulations.

Figure 22: Eco-Bot website – dedicated CTO pitch webpage

POWER UTILITY IN SPAIN



Estabanell is an electric utility based in Catalonia, Spain. As part of the project, eco-bot will be offered to residential clients of Estabanell.

What does eco-bot offer for residential clients of the utility? For utility clients eco-bot offers several advantages:

- Consumption, cost, and impact: inform about consumption between any two days, its cost, and its environmental impact.
- Appliances: inform about the consumption of the main appliances at home so clients have a better indication of where a big part of their consumption is going
- Procedures: give information on procedures that can be made with the company and how, without the person having to call or come to the office to inquire
- Recommendations: send recommendations to clients on how they can become more efficient
- Notifications: allow clients to receive customizable notifications about their consumption (for example when it has been especially high)

What does eco-bot offer for the utility?

- Eco-bot can give information often asked to the customer service office, gives it instantly, and is available to 24/7
- Eco-bot offers information and functionalities to clients not traditionally offered by utilities, empowering them, and improving their experience with the company.
- Eco-bot allows the utility to use consumption data and turn it into useful easy insights for clients
- Eco-bot allows both the utility and its customers to be more "eco" as customers are accompanied by eco-bot helping them become more energy efficient

Details about the pilot:

- The pilot is taking place in Granollers and surrounding towns, in the region of Valles Oriental next to Barcelona
- Eco-bot is offered in Spanish
- For a part of the participants eco-bot also uses more granular consumption data coming from an additionally installed meter, this allows eco-bot to give more precise appliance consumption data

Sabies que...

- No despendeu els electrodomèstics consumint un 10% de l'energia de la casa?
- La televisió en stand-by consumeix la meitat d'energia que un ordinador totalment operatiu?
- Quan calen un fan elèctric, parden el 20% de l'energia calafiteja?
- La càrrega de responsabilitat de gairebé el 50% del consum energètic, d'un fan?
- La reventa de l'aparell elèctric, que més eficiència costa?

Hola! Soc l'eco-bot

Soc el teu assessor energètic i he arribat dissenyat per ajudar-te a millorar la teua eficiència energètica.

Vinc connectat al teu comptador i disposo d'una base de dades desenvolupada a partir de recomanacions d'eficiència energètica. Així pots aconseguir fer un ús dels electrodomèstics, donar resposta als dubtes sobre consum elèctric i ajudar-te a fer hàbits.

Estic sempre disponible online.



Què és un xat-bot?

En xat-bot són programes informàtics que incorporen la intel·ligència artificial per ser capaços de mantenir una conversa amb tu i perquè ells

Què puc fer per a tu?

Respectar el medi ambient
Reduir el cost de la factura

- **Consum, cost i impacte:** Informar sobre el consum, el cost de la teua factura i l'impacte que generen sobre el medi ambient.
- **Aparells elèctrics:** detallar la informació sobre el consum que generen els teus electrodomèstics.
- **Tècniques:** ajudar a actuar alguns dels hàbits que podries fer des d'una altra perspectiva.
- **Recomanacions:** aconseguir accions per a millorar la teua eficiència energètica.
- **Notificacions:** enviar notificacions sobre canvis que has fet en el teu consum (per exemple, quan pagas més).



Figure 23: Eco-Bot website EYPESA pilot page

RESIDENTIAL ENERGY MONITORING PLATFORM IN GERMANY



SEnerCon is an SME based in Berlin operating an online energy monitoring platform called interactive Energy Savings Account (IESA) which is applied in climate protection campaigns run by the non-profit company co2online in Germany. The IESA helps consumers get an overview on their energy consumption for electricity, space heating and mobility and to monitor their water consumption.

Eco-Bot has been integrated into the Energy Savings Account as a chatbox and offers the following advantages to households:

- Immediate feedback when users are asking about their energy consumption, costs and CO₂ emissions (also related to car kilometers and trees needed to absorb the emissions) of any time period entered
- Impact of energy-saving activities implemented by the user (comparison of energy consumption and cost)
- Information on the cost-benefit of new appliances compared to their old ones
- Information on the energy consumption of their main household appliances
- Personalized energy saving tips
- Notification on high consumption and monitoring of personal energy saving goals

Advantages for co2online and SEnerCon:

- New direct communication channel with users in addition to IESA charts and tables
- Energy saving advice beyond sole energy monitoring features by IESA
- Energy-saving events entered by users through Eco-Bot for anonymized research studies on the effect of energy-saving measures
- Test and apply new innovative technology that is a step ahead of the market

Details about the pilot:

- Eco-bot is offered to IESA users all over Germany
- Language: German
- The majority of pilot participants have normal electricity meters installed in their homes – some households are testing Eco-Bot in combination with smart meters of a 10s resolution of the company Discovery which allows Eco-Bot to give more precise appliance consumption data.




Figure 24: Eco-Bot website SEC pilot page

COMMERCIAL BUILDING MANAGERS IN EUROPE



Insights from real users in the eco-bot B2B pilot

Interview with energy managers: Galdric Ruiz & Nil Bufí

Watch on  YouTube

DEXMA is a leading building energy management system provider, offering an international SaaS platform focused on energy efficiency which is monitoring more than 24,000 buildings, distributed through a network of 275 partners serving 2,500 customers in 45 countries. Partners are mainly energy services companies (ESCOs), utilities and integrators that manage tertiary buildings like corporate buildings, hotels, retail sector, public administration buildings (hospital, city halls, public schools, cultural centers, universities, etc) and industries.

The demo case in DEXMA's Energy Management System, DEXMA Analyse, is a B2B (business to business) use case – this means that Energy Management System (EMS) users, like facility managers, will use the chatbot in order to increase and/or improve the functionalities of the EMS. The Eco-Bot chatbot offers a variety of functionalities for facility managers and/or owners and energy managers such as a recommendation engine that displays the best available recommendation in order to increase the energy savings in the locations managed by the user, league tables to see the 10 best or worst performing locations in the user's portfolio or set up consumption, cost or carbon emission goals, among other functionalities. The chatbot will allow users to save up a lot of time on energy management, as global KPIs can be displayed by the chatbot in seconds.



Details about the pilot:

- ✓ 3 Energy Services Companies (ESCOs) from 3 European countries (Italy, Spain and the UK) participate in the B2B pilot phase. Energy managers in these companies are participating as Eco-Bot end users.
- ✓ Properties from 3 different economic sectors are monitored in this phase: restaurants, supermarkets and hotels. Historical main and submetering electrical consumption data is available.
- ✓ Eco-Bot is offered in English and Spanish

Benefits of using Ecobot

- Allows for time saving and efficiency through better decision making
- Reduces energy duties management to 1 h per week
- Delivers constant legislation updates
- Enables control at major KPIs at a glance
- Allows early problem detection
- Offers various options for push notification intervals
- Facility Managers switch from reactive to proactive

Figure 25: Eco-Bot website DEXMA pilot page

In order to monitor the website activity, we have set up Google Analytics since April 2018 (M7). In the period from April 1, 2018 until March 31, 2019 (M7-M18), the number of new visitors reached 1445, as reported in D6.3, while in the period from April 1, 2019 until January 31, 2020 (M19-M28), 1558 new visitors were recorded, as reported in D6.4. In the period from February 2020 until June 2021 (M29-M45), the number of new visitors reached 4344. The distribution of visitors per month for the latter period, as well as other additional website usage metrics, are shown in Figure 26.

Moreover, Figure 27 shows the distribution of visitors by country for the 10 top countries that have visited the website in the period from M29 to M45. As shown in the figure, the majority of visitors are from Germany (13.03%), followed by Spain (6.85%).

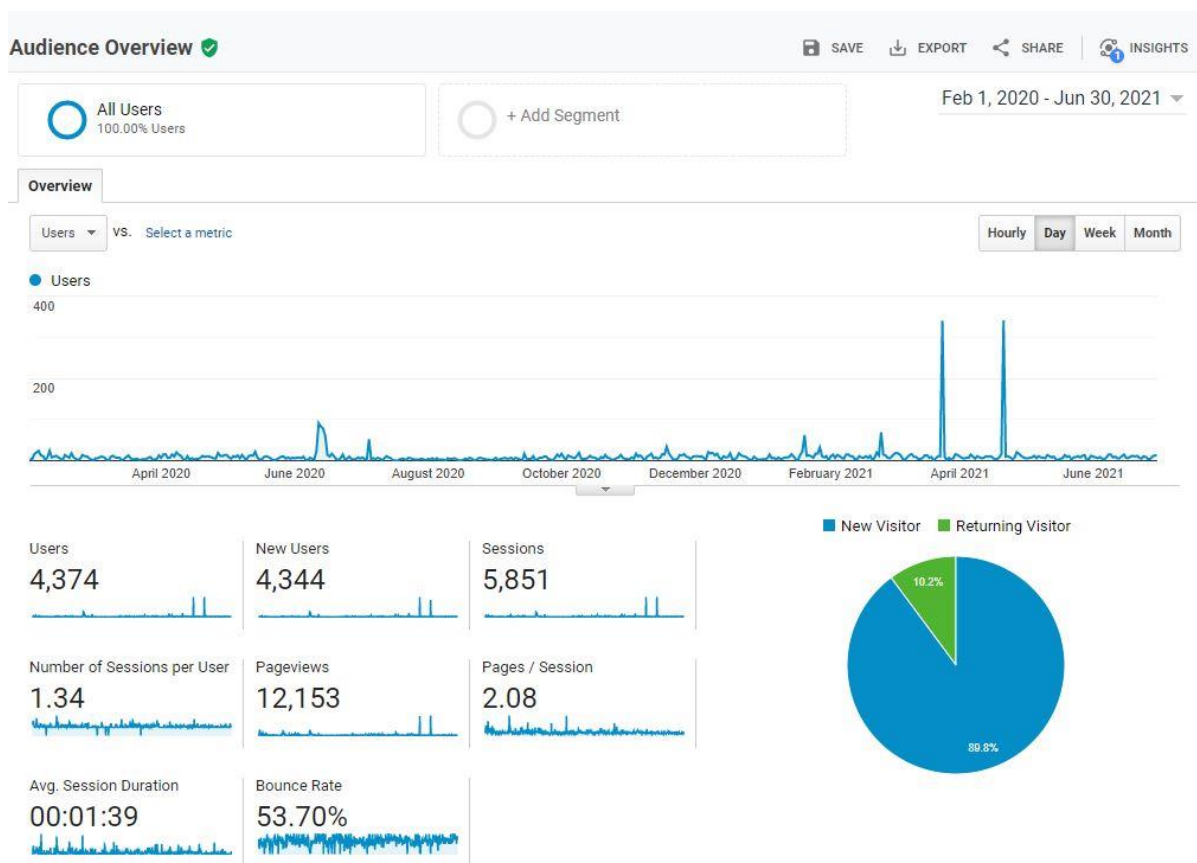


Figure 26: Eco-Bot website analytics for the period M29-M45

Country	Users	% Users
1. Germany	571	13.03%
2. Spain	300	6.85%
3. United States	295	6.73%
4. Greece	230	5.25%
5. China	216	4.93%
6. France	210	4.79%
7. United Kingdom	182	4.15%
8. India	154	3.51%
9. Brazil	150	3.42%
10. Poland	118	2.69%

Figure 27: Eco-Bot website visitors by country for the period M29-M45

As far as the whole monitored period from April 1, 2018 until June 30, 2021 (M7-M45) is concerned, the number of new visitors reached 7347. The distribution of visitors per month for the whole period, as well as other additional website usage metrics, are shown in Figure 28.

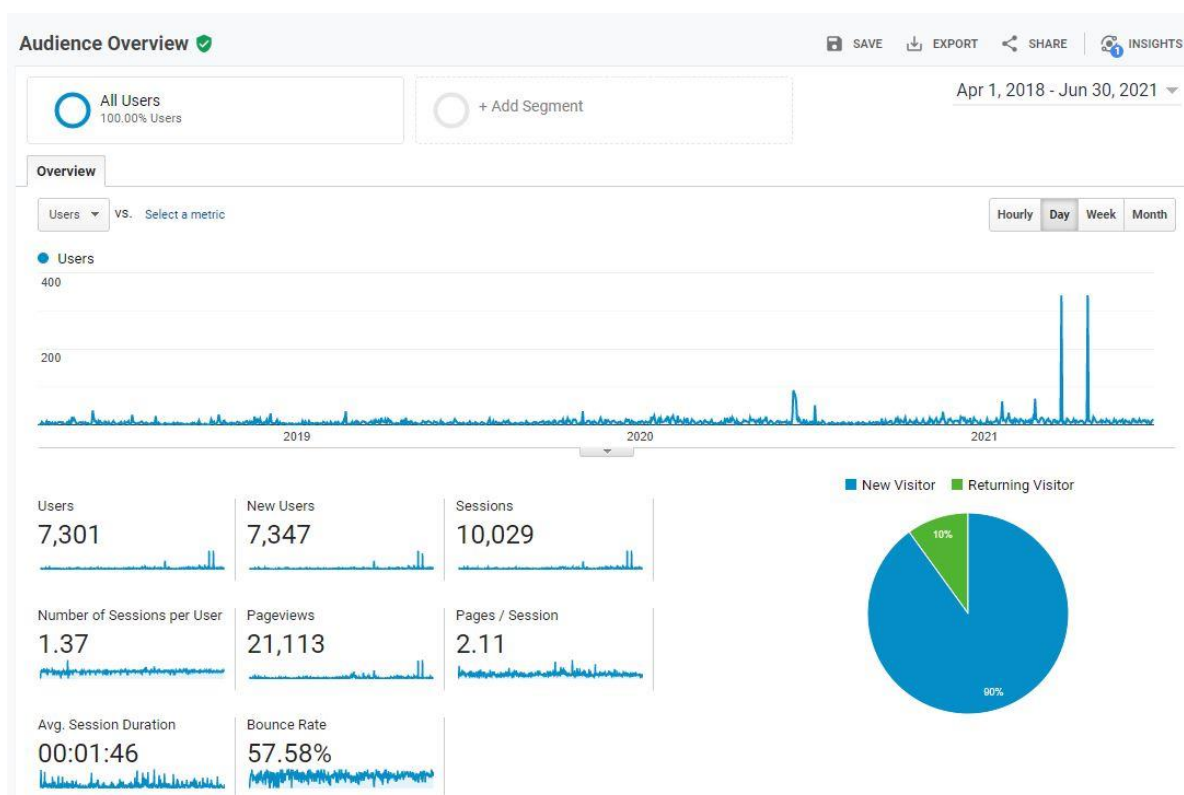


Figure 28: Eco-Bot website analytics for the period M7-M45

Figure 29 shows the distribution of visitors by country for the 10 top countries that have visited the website during the whole monitored period from M7 to M45. As depicted in the figure,

overall, the majority of visitors are from Germany (14.42%), followed by Spain (9.32%). This was expected as we were focusing on participants' recruitment and awareness raising where pilots were situated.





















Country	Users	% Users
1.  Germany	1,062	 14.42%
2.  Spain	686	 9.32%
3.  United States	608	 8.26%
4.  Greece	451	 6.12%
5.  United Kingdom	292	 3.97%
6.  France	289	 3.92%
7.  Poland	284	 3.86%
8.  China	260	 3.53%
9.  India	221	 3.00%
10.  Brazil	200	 2.72%

Figure 29: Eco-Bot website visitors by country for the period M7-M45

Project announcements are published also on the partners' websites. Indicatively:

- Project's description on RISA's website:
<http://www.risa.eu/en/informationssystem/contractresearch.php>
- Direct link to Eco-Bot's website on EYPESA's website homepage:
<https://www.estabanell.cat/>
- Project's description on adelphi's website:
<https://www.adelphi.de/de/projekt/eco-bot-entwicklung-virtueller-energiespar-assistenten-f%C3%BCr-die-private-und-gewerbliche> (German version)
<https://www.adelphi.de/en/project/eco-bot-development-virtual-energy-saving-assistants-private-and-commercial-use> (English version)
- Information about the project and the pilot on SEC's website as well as on SEC's energy blog:
<https://www.senercon.de/projekte/eco-bot/>
<https://www.senercon.de/2020/11/25/14483/>
- Project description and interview given from JustaEnergia about Eco-Bot on DEXMA's website:
<https://www.dexma.com/research-and-energy-innovation/all-our-projects/ecobot/>
<https://www.dexma.com/blog-en/interview-with-pinelopi-spyropoulou-from-justaenergia-about-eco-bot-project/>

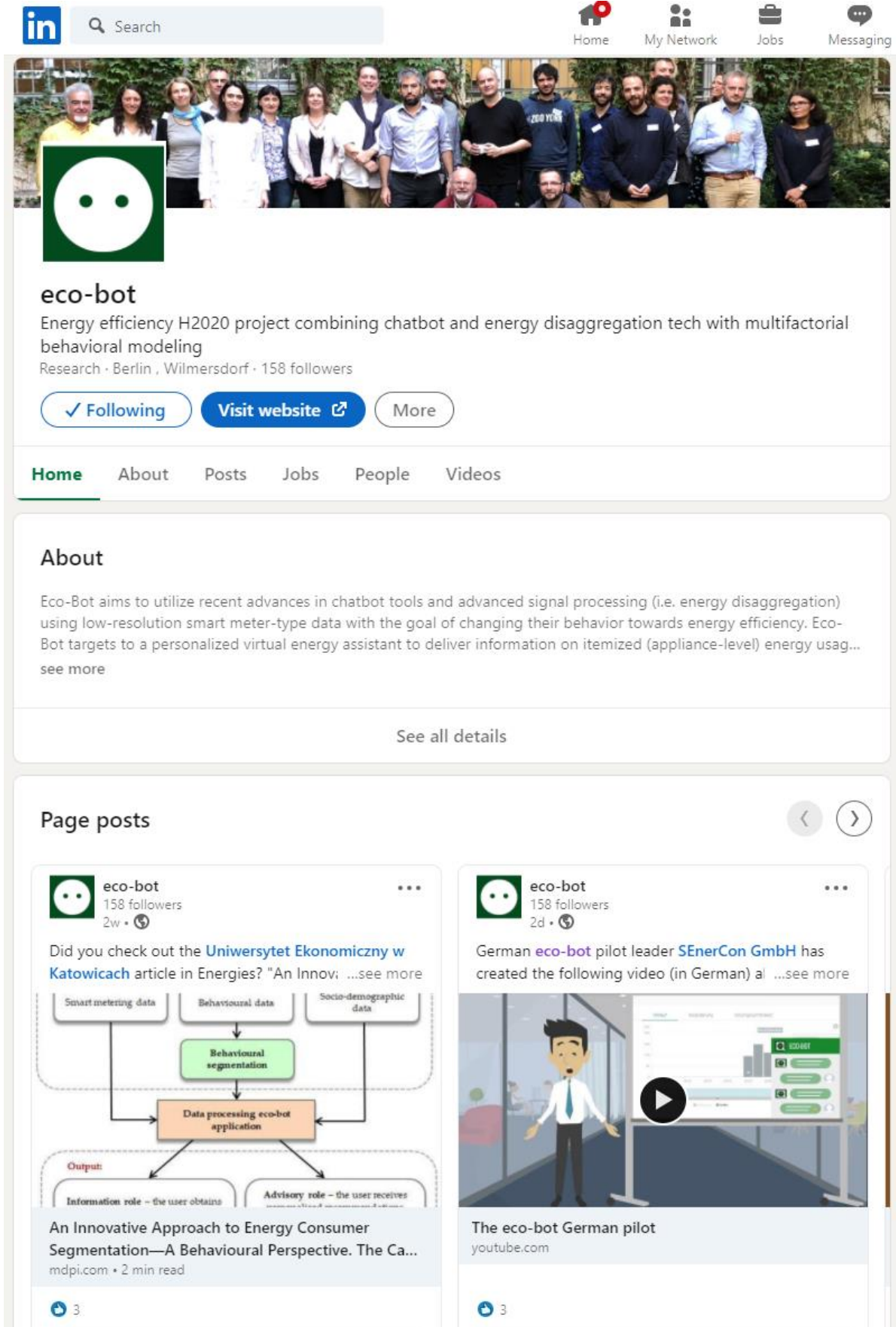
- Project's description and links to project's social networks and outputs (activities and papers) from USTRAT on USTRAT's website:
<https://pureportal.strath.ac.uk/en/projects/eco-bot-personalised-ict-tools-for-the-active-engagement-of-consu>
- Project's description on PLEGMA's website:
<http://pleg.ma/research/>
- Project's description and video from the interview given about Eco-Bot from UEKAT to Poland In channel on UEKAT's website:
https://www.ue.katowice.pl/no_cache/en/university/news/article/european-research-project-eco-bot-with-the-participation-of-the-ue-katowice-video.html (English version)
https://www.ue.katowice.pl/no_cache/pracownicy/nauka-i-biznes/article/europejski-projekt-badawczy-eco-bot-z-udzialem-ue-katowice-wideo.html (Polish version)
- Information on UEKAT's website about the publication of an article on Eco-Bot in the Science in Poland portal:
https://www.ue.katowice.pl/no_cache/pracownicy/nauka-i-biznes/article/kolejny-etap-europejskiego-projektu-badawczego-eco-bot.html
- Project's description on ERRA's website:
<http://erra.gr/index.php/researchanddevelopment/researchprojects>

4.2. Social Media

Social media channels are used to reach a wider audience frequently and cost-effectively, in order to create and raise awareness and communicate progress and results. Project news, achieved milestones, Eco-Bot events, participation in external events, videos, and any other relevant project announcements are shared through the social media of Eco-Bot. Project-related announcements are also published in the social media of the consortium partners.

4.2.1. LinkedIn

The Eco-Bot LinkedIn account (<https://www.linkedin.com/company/eco-bot/>) has attracted 161 followers.



The screenshot shows the LinkedIn profile of 'eco-bot'. At the top, there's a header with the LinkedIn logo, a search bar, and navigation icons for Home, My Network, Jobs, and Messaging. The profile banner features a group photo of the project team. Below the banner is the profile picture, which is the same green speech bubble logo. The name 'eco-bot' is followed by the description 'Energy efficiency H2020 project combining chatbot and energy disaggregation tech with multifactorial behavioral modeling' and 'Research · Berlin · Wilmersdorf · 158 followers'. There are buttons for 'Following', 'Visit website', and 'More'. Below this is a navigation bar with tabs for Home, About, Posts, Jobs, People, and Videos. The 'About' section is expanded, showing a detailed description of the project's goals and a 'See all details' link. The 'Page posts' section shows two recent posts. The first post is a text-based announcement about an article in 'Energies' with a flowchart diagram. The second post is a video announcement about a German pilot project by SEnerCon GmbH.

eco-bot
Energy efficiency H2020 project combining chatbot and energy disaggregation tech with multifactorial behavioral modeling
Research · Berlin · Wilmersdorf · 158 followers

Following Visit website More

Home About Posts Jobs People Videos

About

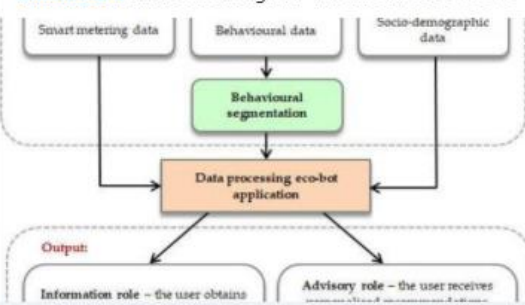
Eco-Bot aims to utilize recent advances in chatbot tools and advanced signal processing (i.e. energy disaggregation) using low-resolution smart meter-type data with the goal of changing their behavior towards energy efficiency. Eco-Bot targets to a personalized virtual energy assistant to deliver information on itemized (appliance-level) energy usag...
see more

See all details

Page posts

eco-bot
158 followers
2w · 🌐

Did you check out the [Uniwersytet Ekonomiczny w Katowicach](#) article in *Energies*? "An Innov...see more




An Innovative Approach to Energy Consumer Segmentation—A Behavioural Perspective. The Ca...
mdpi.com · 2 min read

3

eco-bot
158 followers
2d · 🌐

German **eco-bot** pilot leader [SEnerCon GmbH](#) has created the following video (in German) al...see more



The eco-bot German pilot
youtube.com

3

Figure 30: LinkedIn account

4.2.2. Twitter

A Twitter account (<https://twitter.com/ecobotproject>) has been created and is being updated with news and information about the project. The number of followers until the end of the project reached 259.

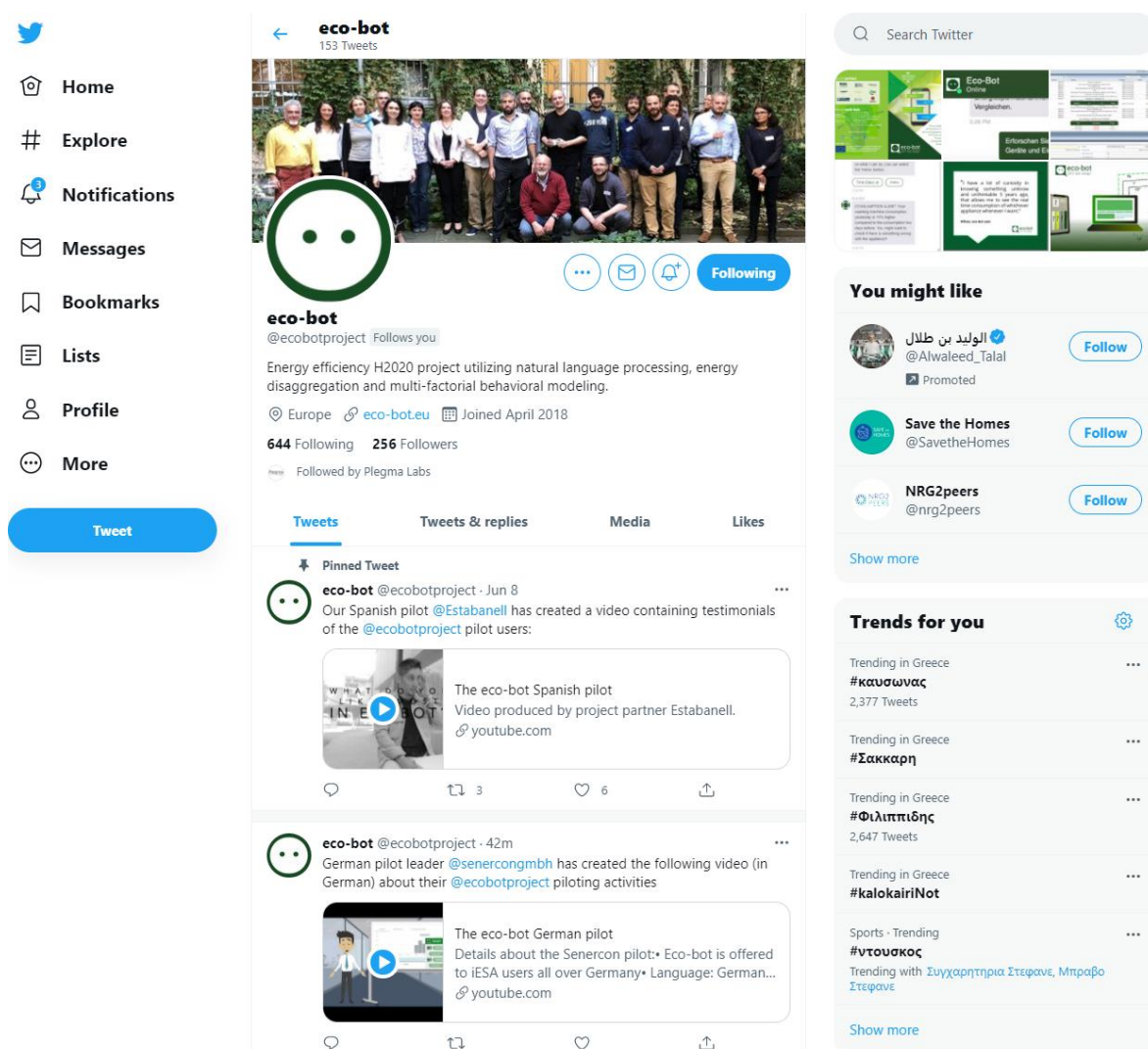


Figure 31: Twitter account

4.2.3. YouTube

We have also set up a [YouTube account](#), which is used for disseminating Eco-Bot videos. Six Eco-Bot videos have been uploaded so far on YouTube. The YouTube account is promoted through the project's website and posts in social media.

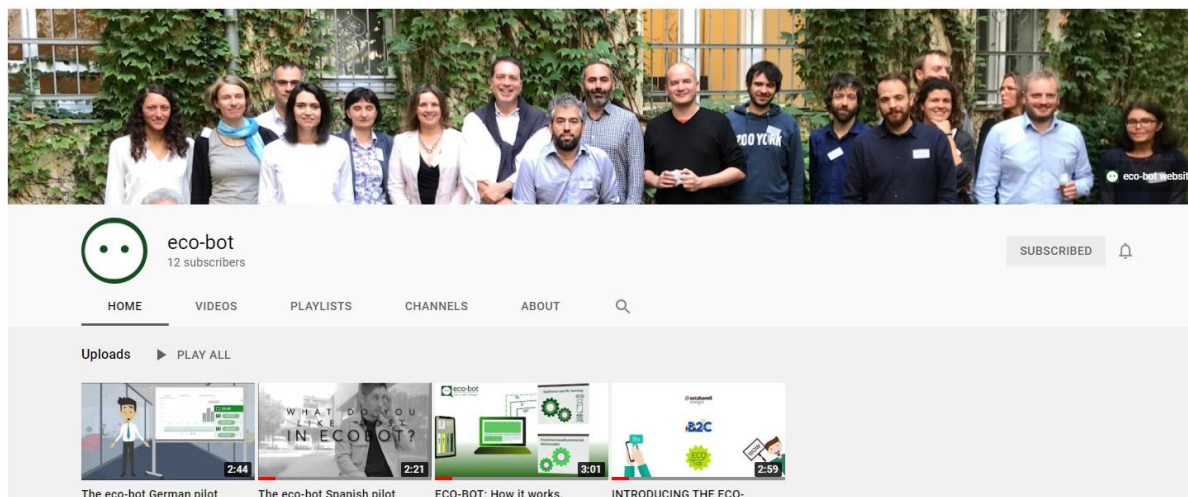


Figure 32: YouTube account

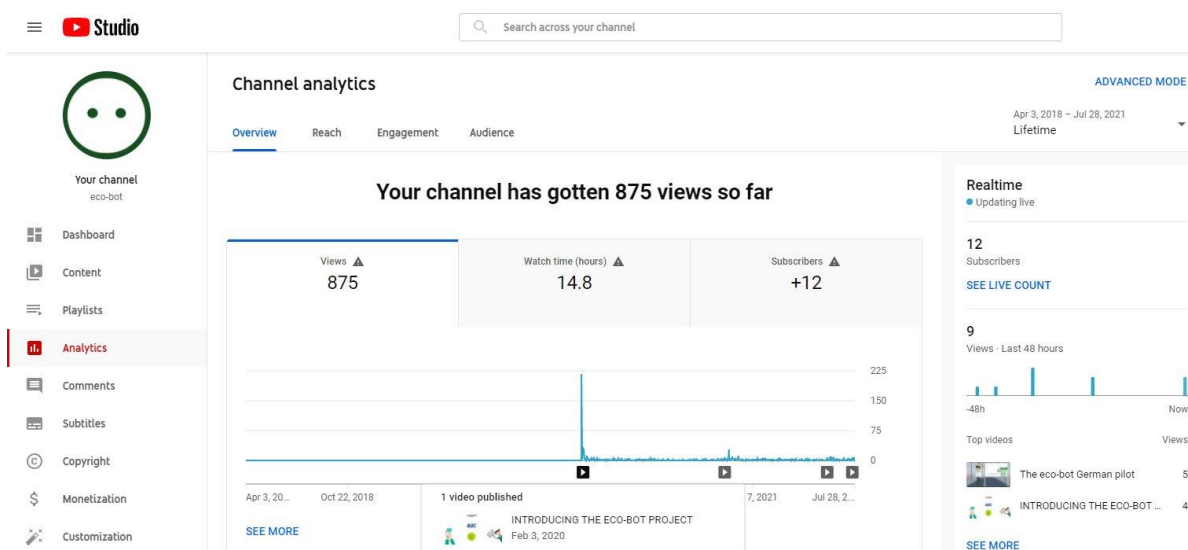


Figure 33: YouTube channel analytics

4.2.4. Pilot-related posts in Social Media Accounts

After the second review, it became clear that emphasis should be given in the dissemination of pilot news and updates, including user stories and pilot findings and highlighting top features per business case. In accordance with the pilot-related dissemination plan of the revised version of D5.1, such information was disseminated during the last phase of the project through the pilot partners' corporate social media accounts as well as through the project's social media accounts. These pilot-related posts are indicated below:

SEC

SEC disseminates pilot activities and information through the company's Facebook account:

<https://www.facebook.com/senercongmbh/posts/4232380320158238>

<https://www.facebook.com/senercongmbh/posts/3717783428284599>

<https://www.facebook.com/senercongmbh/posts/3694504817279127>

<https://www.facebook.com/senercongmbh/posts/4232380533491550>

<https://www.facebook.com/senercongmbh/posts/4152921301437474>

<https://www.facebook.com/senercongmbh/posts/3654479931281616>

<https://www.facebook.com/senercongmbh/posts/4051133168282955>

EYPESA

EYPESA disseminates pilot-related information through the company's Twitter account:

<https://twitter.com/Estabanell/status/1313089050174160898>

<https://twitter.com/Estabanell/status/1323610883046608896>

<https://twitter.com/Estabanell/status/1336969655563419648>

<https://twitter.com/Estabanell/status/1361599195694698496>

<https://twitter.com/Estabanell/status/1364125797934632964>

<https://twitter.com/Estabanell/status/1372818463388004356>

DEXMA

DEXMA disseminates information about Eco-Bot through the company's Twitter, Facebook and LinkedIn accounts:

https://www.linkedin.com/posts/dexma-energy-intelligence-by-spacewell_eco-bot-has-entered-its-final-and-most-exciting-activity-6717443110374297600-kFm/

https://www.linkedin.com/posts/dexma-energy-intelligence-by-spacewell_pinelopi-spyropoulou-from-justaenerg%C3%ADa-talks-activity-6734049749034438656-SfMy/

https://www.linkedin.com/posts/dexma-energy-intelligence-by-spacewell_eco-bot-how-it-works-activity-6737727016646311936-adhr/

<https://www.linkedin.com/feed/update/urn:li:activity:6775712161877557248/>

<https://www.linkedin.com/feed/update/urn:li:activity:6760507691950501888/>

<https://twitter.com/dexma/status/1329689936644214784>

<https://twitter.com/dexma/status/1331545411513950208>

<https://twitter.com/dexma/status/1341048915274182662>

<https://twitter.com/dexma/status/1369922542505451521>

https://twitter.com/dexma_ES/status/1369957774705184771

<https://www.facebook.com/DEXMAtech/posts/3402896303121247>

<https://www.facebook.com/DEXMAtech/posts/3424629074281303>

Eco-Bot's social media accounts

Pilot-related information is also disseminated through the social media accounts of the project. The links of relevant posts are given below. Besides these posts, all of the Eco-Bot pilot-related posts that were published by the pilot partners were shared / retweeted through the project's accounts, however there is no URL post when there is no additional text inserted.

https://www.linkedin.com/posts/eco-bot_the-eco-bot-german-pilot-activity-6825801483196370944--9BV/

https://www.linkedin.com/posts/eco-bot_interview-with-german-eco-bot-pilot-user-activity-6817724369016557568-D-tJ

https://www.linkedin.com/posts/eco-bot_chatbot-energyefficiency-innovation-activity-6775814789760352256-aYBU

https://www.linkedin.com/posts/eco-bot_the-eco-bot-spanish-pilot-activity-6807969971767939072-f1zQ

https://www.linkedin.com/posts/eco-bot_ecobot-chatbot-energyefficiency-activity-6760940870033252353-AE_6

https://www.linkedin.com/posts/eco-bot_eco-bot-activity-6749229089871204352--fNt

https://www.linkedin.com/posts/eco-bot_tips-from-co2online-on-how-to-save-energy-activity-6803276815818391552-CYCA

https://www.linkedin.com/posts/eco-bot_pinelopi-spyropoulou-from-justaenerg%C3%ADa-talks-activity-6734526058386792448-vxQH

https://www.linkedin.com/posts/eco-bot_eco-bot-estabanell-activity-6742349129873207296-HbJ6

https://www.linkedin.com/posts/eco-bot_energy-h2020-chatbots-activity-6773188231946153984-e9Qu

https://www.linkedin.com/posts/eco-bot_h2020-nilm-chatbots-activity-6736574576710496256-pkxt

https://www.linkedin.com/posts/eco-bot_we-have-started-to-receive-eco-bot-user-feedback-activity-6720235874417737728-tnkL

https://www.linkedin.com/posts/eco-bot_eco-bot-has-entered-its-final-and-most-exciting-activity-6717441048286777344-xLtt

https://www.linkedin.com/posts/eco-bot_energy-assistant-energyconsumption-activity-6654304879395250176-4svN

https://www.linkedin.com/posts/eco-bot_great-news-the-eco-bot-project-pilot-activity-6653714475893481472-0-UQ

<https://twitter.com/ecobotproject/status/1247949602784972800?s=20>

<https://twitter.com/ecobotproject/status/1311676394586492931?s=20>

<https://twitter.com/ecobotproject/status/1314469533793558528?s=20>

<https://twitter.com/ecobotproject/status/1328664774251606016?s=20>

<https://twitter.com/ecobotproject/status/1328741713070993413?s=20>

<https://twitter.com/ecobotproject/status/1330808115156103169?s=20>

<https://twitter.com/ecobotproject/status/1355179822771818497?s=20>

<https://twitter.com/ecobotproject/status/1367423231335026692?s=20>

<https://twitter.com/ecobotproject/status/1421047888998715395?s=20>

<https://twitter.com/ecobotproject/status/1402205292268503047?s=20>

Moreover, all Eco-Bot pilot-related posts posted by the pilots were retweeted through the project's account, however there are no URL posts for those as there was no additional text inserted.

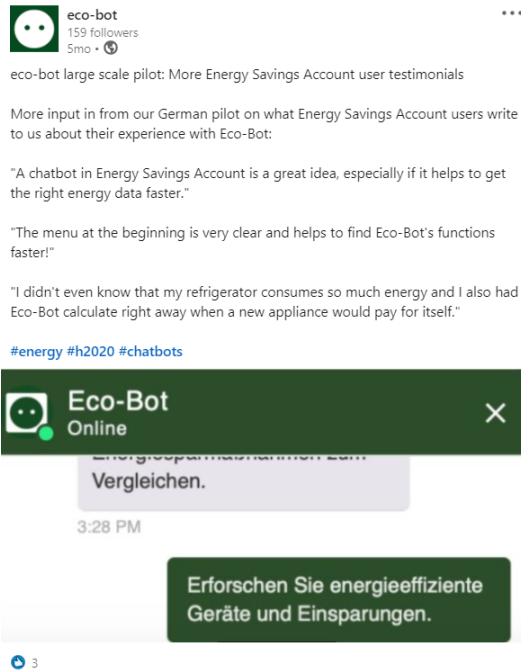


Figure 34: Indicative SEC pilot-related posts

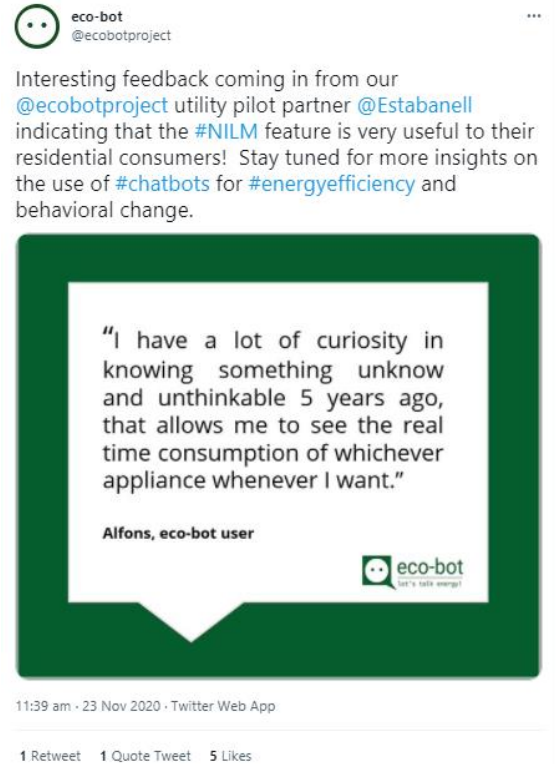


Figure 35: Indicative EYPESA pilot-related posts

DEXMA Energy Intelligence By Spacewell
4,971 followers
10mo · Edited

For Utilities, OEMs or ESCOs, one of the means to actively engage customers is using trending technologies, solutions and apps. This is why, in an urge for energy efficiency, Eco-Bot was brought to life! ☐

We talked to **Pinelopi Spyropoulou** from **JustaEnergia** (Spanish Utility), and she gave us more insights on **eco-bot**, explaining how this innovative tool helped her company to improve their customer loyalty and engagement. Read our interview: <https://dex.ma/3nmusU2>

#Utilities #EnergyServices #EnergyManagement #EnergyEfficiency #EnergyDigitalisation #EcoBot #Chatbot



Pinelopi Spyropoulou from JustaEnergia talks about the Eco-Bot Project
<https://www.dexma.com>

10

DEXMA Energy Intelligence By Spacewell
4,971 followers
7mo

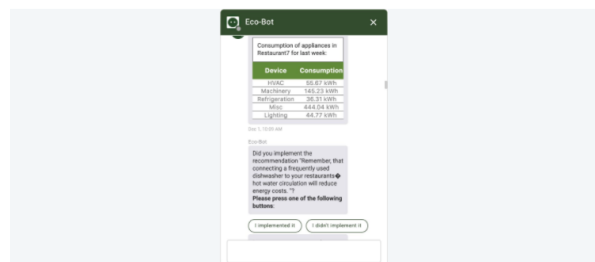
☐ Air conditioning is one of the biggest electricity consumption in commercial buildings. Especially in the hospitality sector.

💡 What if I tell you that there is already a Chat-Bot that gives energy saving recommendations for air conditioning specialised in this sector!

This is ☐ **eco-bot** an energy efficiency chat-bot developed by the Eco-Bot Project, which among its functionalities has the sending of energy-saving recommendations, including steps to reduce HVAC consumption.

Find out more about the eco-bot project at: <http://eco-bot.eu>

#EcoBot #Chatbot #EnergyEfficiency #HVAC #Airconditioning



9

Figure 36: Indicative DEXMA pilot-related posts

4.2.5. Project Announcements through Partners' Social Media Accounts

Besides the pilot-related posts presented above, news and announcements about the project were also communicated to mass audiences through the social media accounts of the partners. Indicatively:

RISA

RISA disseminates information about Eco-Bot through the company's LinkedIn account. Indicatively:

https://www.linkedin.com/posts/risa-sicherheitsanalysen-gmbh_energyefficiency-h2020-chatbot-activity-6806238550221234176-Wkty

EYPESA

All posts published by EYPESA were related to the pilot and were presented in the previous subsection.

adelphi

adelphi disseminates information about Eco-Bot through the company's Facebook and Twitter accounts. Indicatively:

<https://www.facebook.com/adelphi.de/posts/3782868735064108>

<https://www.facebook.com/adelphi.de/posts/3782877975063184>

<https://www.facebook.com/adelphi.de/posts/3782863668397948>

<https://www.facebook.com/adelphi.de/posts/5195586430458991>

<https://www.facebook.com/adelphi.de/posts/5477930295557935>

https://twitter.com/adelphi_berlin/status/1228197301564235778

https://twitter.com/adelphi_berlin/status/1359480709723942912

SEC

Besides the pilot-related posts, presented in the previous subsection, SEC disseminates project information and news through the company's Facebook account. Indicatively:

<https://www.facebook.com/senercongmbh/posts/3574349829294627>

DEXMA

All posts published by DEXMA were related to the pilot and were presented in the previous subsection.

PLEGMA

PLEGMA disseminates information about Eco-Bot through the company's LinkedIn, Twitter, and Facebook accounts. Indicatively:

https://www.linkedin.com/posts/plegma-labs_h2020-chatbot-reseach-activity-6628719911705292800-ox24

<https://twitter.com/PlegmaLabs/status/1329415512254795779>

<https://twitter.com/PlegmaLabs/status/1397549063655018496>

<https://twitter.com/PlegmaLabs/status/1227229363030167553>

<https://twitter.com/PlegmaLabs/status/1225040532671533056>

https://www.facebook.com/permalink.php?story_fbid=3591087870949397&id=634368869954660

Also, PLEGMA has retweeted many Eco-Bot posts, for which there is no link as this is Twitter's policy when there are no comments inserted.



Figure 37: Partners' indicative Twitter posts on Eco-Bot



Figure 38: Partners' indicative Facebook posts on Eco-Bot

4.3. Scientific Journals and Conferences

This section presents the efforts made during the last reporting period to disseminate the project's research findings and outcomes to the scientific community, through publications in journals and participation in scientific conferences and workshops.

4.3.1. Publications in Journals

A paper written by USTRAT was published online in February 2020 and in print in July 2020 in "IEEE Transactions on Smart Grid". The publication details are as follows:

Afrasiabi, M., Mohammadi, M., Rastegar, M., Stankovic, L., Afrasiabi, S., & Khazaei, M. (2020). Deep-based conditional probability density function forecasting of residential loads. *IEEE Transactions on Smart Grid*, 11(4), 3746-3757. [8988175]. <https://doi.org/10.1109/TSG.2020.2972513>

The paper described a new method for load forecasting of residential loads using deep neural networks. The paper is published in a prestigious journal with a high impact factor of 8.26 and though only recently being published, it has already attracted 14 scientific citations.

Another paper written by USTRAT was published in June 2020 in "Applied Energy". The publication details are as follows:

Zhao, B., Ye, M., Stankovic, L., & Stankovic, V. (2020). Non-intrusive load disaggregation solutions for very low-rate smart meter data. *Applied Energy*, 268, [114949]. <https://doi.org/10.1016/j.apenergy.2020.114949>

The paper shows possibilities of NILM algorithms for very low-rate smart meter data (15mins to 1 hour). Three different NILM methods were developed and compared – one unsupervised method based on minimising the error between aggregate and disaggregated loads, the second method based on unsupervised label propagation over graphs using graph Laplacian regularisation, and the third method based on convolutional neural networks. The paper discusses how sampling rate affects the performance as well as the meaning and usefulness of various performance measures. This work directly informed the Eco-Bot NILM model, sampling rates used, and the selection of performance measures to appropriately quantify accuracy of the results. The paper was published in a high impact journal (impact factor 8.85) and has already been cited 16 times.

A paper written by UEKAT was published in April 2021 in "Energies". The publication details are as follows:

Słupik S, Kos-Łabędowicz J, Trzęsiok J. Energy-Related Behaviour of Consumers from the Silesia Province (Poland)—Towards a Low-Carbon Economy. *Energies*. 2021; 14(8):2218. <https://doi.org/10.3390/en14082218>

The paper identifies individual attitudes and beliefs of energy consumers using the example of the residents of the province of Silesia (Poland). The research presented is divided in two parts: the first shows an expert segmentation of respondents in terms of motivation to save energy, based on the results of empirical data; the second involves using a classification model that allowed for the characterisation of the obtained groups. The results show that the psychological and financial factors are of greatest significance. Nonetheless, the obtained results explicitly indicate the specificity of the region, which requires transformation towards a low-emission economy. The obtained research results and the conclusions drawn contribute to the expansion of the concept of segmentation of Eco-Bot energy consumers in accordance with their internal beliefs, motivations and past behaviours. The paper was published in an open access high impact journal (impact factor 3.004), has already been cited once and has been read 471 times.

Another paper written by UEKAT was published in June 2021 in “Energies”. The publication details are as follows:

Słupik S, Kos-Łabędowicz J, Trzęsiok J. An Innovative Approach to Energy Consumer Segmentation—A Behavioural Perspective. The Case of the Eco-Bot Project. *Energies*. 2021; 14(12):3556. <https://doi.org/10.3390/en14123556>

The paper summarises the preliminary research results of the Eco-Bot project, where the novel model of energy consumer segmentation, based on behavioural variables was developed. The model considers influence of consumer decisions and motivations towards energy savings regardless of demographic, geographic and socio-cultural differences. The segmentation involved adopting—a priori—five basic classes of consumers, varying in terms of motivation to save energy: 1. the Ecological Idealist (EI), was mainly driven by a sense of inner responsibility (intrinsic source of motivation), while 2. the Aspiring Ecologist (AE) was influenced by the environment and social pressure, either experienced or perceived (extrinsic motivation); 3. the Opportunist (O) was responsive to pro-environmental and financial arguments, but limit their actions either due to aversion to change or fear of losing comfort and quality of life.; 4. the Dedicated Saver (DS) was motivated and willing to undertake energy-saving measures that require effort and may result in lowering their perceived comfort 5. the Indifferent (I) did not show any interest in their energy consumption levels and did not consider environmental issues when making decisions. The division into five segments was the starting point for the preparation of the characteristics of individual groups, which became the basis for the development of dedicated recommendations and strategies for engaging individual groups of application users in activities aimed at more energy-efficient behaviour. The paper was published in an open access high impact journal (impact factor 3.004) and has been read 438 times.

UEKAT wrote a chapter in the book “Data Analysis and Classification” that was published in June 2021. The publication details are as follows:

Słupik S., Trzęsiok J. (2021) Is Society Ready for Long-Term Investments? —Profiles of Electricity Users in Silesia. In: Jajuga K., Najman K., Walesiak M. (eds) Data Analysis and

Classification. SKAD 2020. Studies in Classification, Data Analysis, and Knowledge Organization. Springer, Cham. https://doi.org/10.1007/978-3-030-75190-6_11

The chapter characterises electricity users from the Silesian Province (Poland) in terms of their attitudes towards energy saving. It shows electricity savings through short- and long-term investment actions. Model types of users were defined in the chapter, so that it was possible to assign the surveyed people to appropriate groups using distance measures dedicated to non-metric variables. Moreover, the user classes formed in this way were characterised; and for that purpose, the measures to study the dependence of qualitative variables—the chi-square test and the Cramer's V coefficient—were used. The results show that the respondents' actions were significantly impacted by financial considerations, i.e., income, which determined the nature of the undertaken investments, and thus significantly influenced the result of the classification. However, the aspects related to environmental protection also significantly differentiate the investors' attitudes. The authors' original contribution is the proposed segmentation of respondents and their characterisation based on the obtained empirical data, which was used in the work on the Eco-Bot project. The chapter was published by the prestigious Springer Publishing, an award-winning publisher of medical and behavioural resources, and has already been downloaded 140 times.

Another paper written by UEKAT was published in September 2021 in "Energies". The publication details are as follows:

Słupik, S.; Kos-Łabedowicz, J.; Trzesiok, J. Are You a Typical Energy Consumer? Socioeconomic Characteristics of Behavioural Segmentation Representatives of 8 European Countries. *Energies* 2021, 14, 6109. <https://doi.org/10.3390/en14196109>

The aim of the article is a comprehensive socioeconomic analysis of particular behavioural types of energy consumers, as a continuation of the authors' previous research. The paper uses statistical methods (chi-square test and correspondence analysis). The identification of socioeconomic factors was carried out on a representative sample of N=4506 respondents from 8 European countries (Czech Republic, France, Greece, Spain, Germany, Poland, Romania, and the United Kingdom). The authors succeeded in combining behavioural segmentation with the socioeconomic characteristics of the created classes. The results indicated that 10 out of 12 examined factors were significant correlated with the behavioural type.

Table 1 outlines the progress made in terms of journal publications during the last 17 months of the project (M29-M45).

Table 1: Progress in journal publications

Paper Title	Partner involved	Journal	Status
Deep-based conditional probability density function forecasting of residential loads	USTRAT	IEEE Transactions on Smart Grid	Published online in February 2020 and in print in July 2020
Non-intrusive load disaggregation solutions for very low-rate smart meter data	USTRAT	Applied Energy	Published in June 2020
Energy-Related Behaviour of Consumers from the Silesia Province (Poland)—Towards a Low-Carbon Economy	UEKAT	Energies - MDPI	Published in April 2021
An Innovative Approach to Energy Consumer Segmentation—A Behavioural Perspective. The Case of the Eco-Bot Project	UEKAT	Energies - MDPI	Published in June 2021
Is Society Ready for Long-Term Investments?—Profiles of Electricity Users in Silesia	UEKAT	Data Analysis and Classification - Springer	Published in June 2021
Are you a typical energy consumer? Socioeconomic characteristics of behavioural segmentation representatives of 8 European countries.	UEKAT	Energies - MDPI	Published in September 2021

4.3.2. Scientific Conferences and Workshops

The presentation of the project at scientific conferences and workshops is one of the main dissemination channels used to reach the scientific and academic audience. During the last 17 months of the project (M29-M45), academic partners participated in one conference and one workshop where they disseminated Eco-Bot and presented work performed in the project. These are outlined in Table 2.

Table 2: Overview of conferences and workshops with Eco-Bot presentations

Conference / Workshop	Date	Location	Partner involved
5 th International Workshop on Non-Intrusive Load Monitoring (NILM' 20)	November 18, 2020	Virtual event	USTRAT

Conference / Workshop	Date	Location	Partner involved
29 th SKAD Conference. Data classification and analysis - theory and applications	September 7-9, 2020	Virtual event	UEKAT

More details regarding the participation of the academic partners in the above scientific events are given below:

5th International Workshop on Non-Intrusive Load Monitoring (NILM' 20)

USTRAT participated in the 5th International Workshop on Non-Intrusive Load Monitoring (<http://nilmworkshop.org/2020/index.html>), co-located with ACM BuildSys 2020 and jointly organised with the EU NILM Workshop. NILM Workshop is the only workshop dedicated only to NILM that brings, every year, researchers and practitioners working on various aspects related to theory and applications of NILM. USTRAT presented two papers that are both also available in the conference proceedings:

- Mohammad Khazaei, Lina Stankovic and Vladimir Stankovic. 2020. Evaluation of low-complexity supervised and unsupervised NILM methods and pre-processing for detection of multistate white goods. In *The 5th International Workshop on Non-Intrusive Load Monitoring (NILM' 20)*. November 18, 2020, Virtual Event, Japan. ACM, New York, NY, USA, 5 pages. <https://doi.org/10.1145/3427771.3427850>

This paper provides an experimental comparison of various NILM approaches suitable for low-complexity implementation. Unsupervised and supervised methods are compared focusing on white goods. The paper was downloaded 40 times.

- David Murray, Lina Stankovic, Vladimir Stankovic. 2020. Explainable NILM Networks. In *The 5th International Workshop on Non-Intrusive Load Monitoring (NILM'20)*, November 18, 2020, Virtual Event, Japan. ACM, New York, NY, USA, 6 pages. <https://doi.org/10.1145/3427771.3427855>

This paper focused on explaining the decisions made by the NILM module similar to the one deployed in the Eco-Bot study. Explaining the outputs of the NILM deep learning network are especially important to build trust in the decisions and recommendations and also for the developers working on analysing and further improving the NILM model. The paper has been cited three times and downloaded 41 times.

29th SKAD CONFERENCE. Data classification and analysis - theory and applications

UEKAT participated in the 29th SKAD Conference. Data classification and analysis - theory and applications (<https://wzr.ug.edu.pl/skad-2020/>). SKAD is a member of the International Federation of Classification Societies (IFCS) and organises annual scientific conferences for the exchange of research results. The aim of the SKAD conference is to present the achievements and exchange of experience in the field of theoretical and application

classification and data analysis such as: taxonomy, linear ordering methods, methods of statistical multivariate analysis, discriminant analysis, methods of continuous variable analysis, methods of discrete variable analysis, symbolic data analysis, graphical methods, spatial data analysis, financial analysis and many others. UEKAT presented a paper entitled: Is Society Ready for Long-Term Investments?—Profiles of Electricity Users in Silesia, which was published in 2021 by the Springer publishing house (https://doi.org/10.1007/978-3-030-75190-6_11).

4.4. Events

Attendance and organisation of events, as well as networking activities, enable large scale dissemination of Eco-Bot and engagement of key stakeholders, and help ensure project's sustainability and future exploitation. In this section, we focus on external events, besides scientific conferences described previously, where Eco-Bot was disseminated.

4.4.1. Participation in external events

During the last 17 months of the project (M29-M45), several planned major events, such as workshops and exhibitions, were cancelled, postponed or switched to virtual events with adapted programmes, due to the Covid-19 pandemic. Unavoidably, this situation affected the consortium partners' plans for participation in major exhibitions with Eco-Bot booths and presentation of the project in large physical events that would bring together multiple stakeholder groups and would facilitate networking and dissemination efforts to large key audiences.

Indicatively, the consortium was planning to participate with a project booth in the European Utility Week, which is now rebranded to Enlit Europe (<https://www.enlit-europe.com/>), unifying Clarion Energy's worldwide series of Utility Week and POWERGEN events. However, the Enlit Europe conference, originally scheduled for October 27-29, 2020, will be eventually held between November 30 and December 2, 2021, in Milan, Italy.

Moreover, UEKAT was planning to present Eco-Bot in two other events that were postponed due to Covid-19 to later dates, after the project's end. More specifically:

UEKAT applied to participate with a speech (20 minutes of presentation) for the 5th edition of the Silesian Science Festival (<https://www.slaskifestiwalnauki.pl/o-festiwalu>), which was to be held on April 10-12, 2021. Unfortunately, due to the Covid-19 pandemic, the festival has been postponed and will run on October 9-15, 2021. UEKAT is preparing a lecture/presentation entitled: "Energy, ecology, smartphone - does it connect?".

The participants of the lecture will have the opportunity to check if only ecology enthusiasts are able to save energy. They will find out what motivates the average Smith to reduce energy consumption and whether it is really that difficult in the era of consumerism. They will answer the question what is important to them, how to change their habits and daily routine. During the lecture, a tool supporting energy management at home will be presented (Eco-Bot application), as well as practical tips for the effective use of home appliances.

UEKAT also applied to participate (with a poster presentation) in the event "Prosumer Energy in the Dimensions of Sustainable Development" organised by the 3X20 Cluster. The event was supposed to take place in February 2021, but it was moved to next year – the date is not yet known. UEKAT was to present the results of the Eco-Bot project and show how energy can be managed at home using various IT tools, including the Eco-Bot application. The aim was to raise the environmental awareness of the participants, as the conference was to be an open event based on the exchange of experiences and thematic discussions.

It should be noted that the Covid-19 situation and the resulting change of plans w.r.t. specific dissemination channels, urged the consortium to focus even more on liaison activities and the organisation of online Eco-Bot workshops with targeted groups of stakeholders. These activities are discussed in D6.11 and WP7 deliverables.

4.4.2. Organisation of Eco-Bot events

Two Eco-Bot workshops were organised during the first 18 months of the project, aiming to disseminate the project's objectives, competitive advantages and expected results, and to receive feedback from relevant stakeholders. These events were described in detail in D6.9 and were also briefly outlined in D6.3.

During the reporting period (M29-M45), the pilot partners SEC and EYPESA organised virtual events to present the German and Spanish pilot, respectively, to potential end-users of Eco-Bot. More information is given below:

On the 16th of December 2020 SEC organised an online event to present and discuss Eco-Bot and the experiences gained within the Eco-Bot pilot with the team of co2online. All employees of co2online were invited to the event, around 30 of them took part. The intention of the event was also to recruit new Eco-Bot participants among the employees of co2online.

On the 24th of February 2021 EYPESA organised a webinar addressing the general public on energy efficiency at household level. The topics tackled were: how to read the electricity bill, appliance consumption, how to change behaviour, the environmental impact of electricity consumption and presentation of Eco-Bot and a demonstration. The persons registered were 51, however only 24 actually participated to the webinar. Only 6 of them were EYPESA clients. Right after the webinar a survey was conducted to evaluate the quality of the material used, the speakers and the usefulness of the session. On average the participants rated the webinar 4.4/5.



Figure 39: Announcement of the Eco-Bot webinar held by EYPESA

In addition to the events organised by the pilot partners, a series of exploitation workshops for targeted German and Greek stakeholders took place during the last phase of the project. These workshops are described in detail in WP7 deliverables and are briefly outlined below:

On October 8, 2020, adelphi, RISA, SEC and ERRA organised a first exploitation workshop for German stakeholders in order to show a demo of Eco-Bot, pitch the UVPs and provide information from the pilot experience and potential next steps for cooperation. It was organised as a webinar (cf. agenda and information on date and time in the short flyer in Figure 40). Participants came from Discovergy (a smart meter provider), the German consumer association of North Rhine Westphalia, and DEnBAG, a support service provider to energy consultants.



This project is co-funded by the EU's Horizon 2020 Research & Innovation programme under Grant Agreement No. 767625



Eco-bot Workshop: Chatbot & NILM Technologie zur Förderung von nachhaltigem Verbraucherverhalten

8. Oktober 2020 | 11:00 – 12:15 Uhr

Ort: Webinar via Zoom (Anmeldung bei Lena Domröse:
domroese@adelphi.de)

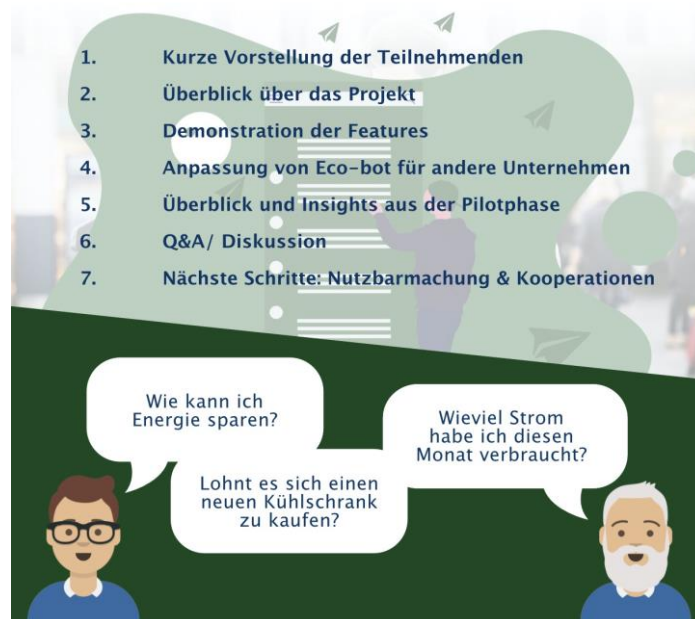


Figure 40: Electronic invitation flyer for the first Eco-Bot exploitation workshop held by adelphi in October 2020

Due to the positive feedback from the first webinar and to the interest from other stakeholders, adelphi organised with RISA, SEC and ERRa a second exploitation workshop for external stakeholders on November 10, 2020. The association of utilities in Germany (ASEW) participated with a group of people from different departments (cf. screenshot of meeting participants below). The workshop was held as a webinar and included information about the project, a live demonstration of the features of the chatbot, information on how to adjust or integrate it into other utilities or businesses, some learnings from the pilots and a discussion of next steps for cooperation.

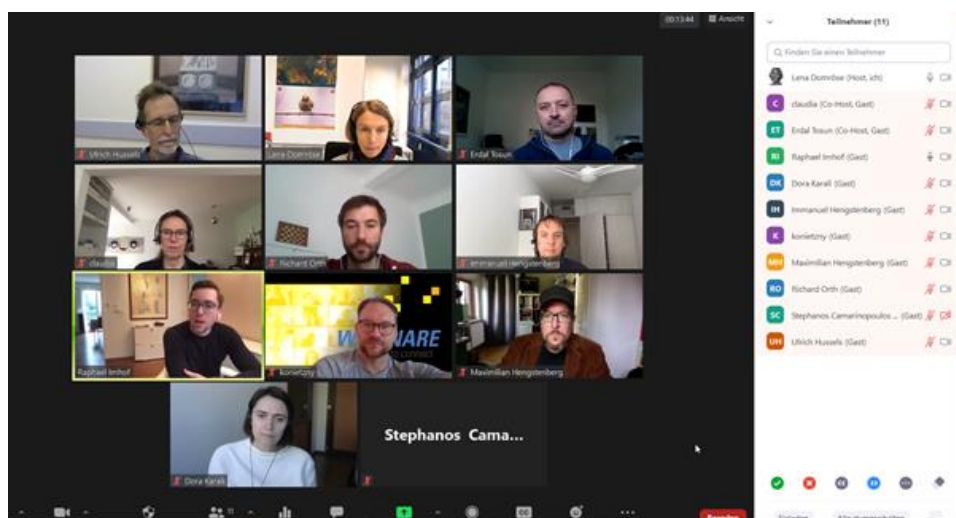


Figure 41: Second Eco-Bot exploitation workshop held by adelphi in November 2020

In April 2021, the Eco-Bot consortium was invited to demonstrate Eco-Bot in front of 23 members of ASEW, as a follow-up activity from the webinar in November 2021.

In April 2021, RISA, ERRA and PLEGMA held four workshops with Greek electricity producers and resellers (Protergia, Elpedison, WATT+VOLT, HERON).

In April 2021, PLEGMA and RISA held a workshop to present Eco-Bot to the directors of technology of two international consulting companies, namely PWS and Deloitte.

In May 2021, RISA and ERRA held a workshop to present Eco-Bot to one of the largest international Real Estate Companies (BARNES International Realty) and discussed collaboration opportunities over sustainable development, and a series of follow-up discussions have been held since then.

In May 2021, RISA and PLEGMA held a workshop with the Digital Transformation Officer of Cognity SA and discussed the potential integration of Eco-Bot solutions with other existing platforms of their portfolio.

In June 2021, RISA and ERRA organised a webinar with a group of Facility Managers working at Piraeus Bank of Greece.

In June 2021, RISA and PLEGMA held a workshop with the innovation team of ARIS Group and discussed business collaboration and potential rollout possibilities of the Eco-Bot system or subsystems.

As mentioned above, detailed information on the above exploitation workshops is presented in WP7 deliverables.

4.5. Mass media activities

The consortium sought opportunities to disseminate the project's main results also through press releases and media articles. The mass media activities that took place during the last phase of the project are shown below.

4.5.1. Press Releases

As was presented in D6.3, the first press release, which announced the launch of the project, was published on M2 and was forwarded by the project partners in their local and national press contacts.

In the action plan defined in D6.2, it was foreseen that press releases would be produced for the European, national and local press. According to the refined action plan presented in the revised version of D5.1, it was foreseen that, although the first press release of the project was used for general dissemination, the following press releases would be more stakeholder-targeted, making use of the pilot findings and success stories.

The press releases that were produced by the pilot partners are as follows:

EYPESA made a press release on the 19th of October 2020 (M37) in order to promote Eco-Bot and recruit participants. The release was made on the local newspaper "El Nou" of Granollers, city where the headquarters of Estabanell are based and where most of their clients live.

EL 9 NOU Dilluns, 19 d'octubre de 2020 **7**

Mango Man tanca la botiga de Granollers

El local del carrer Santa Anna baixarà la persiana aquest dissabte

Granollers

R.P. Mango Man tancarà dissabte la botiga que té al carrer Santa Anna, al centre de Granollers. Ho han confirmat fonts de la multinacional catalana a EL 9 NOU. També han apuntat que la decisió ja s'ha traslladat a la planifitació. Aquests tancaments s'uniran als de dues de les marques del grup Inditex: Massimo Dutti, a la Porxada, i Bershka, al carrer Anselm Clavé, que es van produir durant la segona quinzena de setembre. També al de la botiga Mango de moda per a dones, que ho va fer just després del confinament. Aquest, però, era un establiment franquiciat i no controlat directament per la cadena, com sí que ho és Mango Man. El sector comercial de la ciutat ha expressat el seu neguit per l'impacte que el tancament d'aquests establiments vinculats a grans grups del sector de la moda pot tenir en el comerç de la ciutat. Sobretot, en la capacitat per atraure clients de fora de Granollers o d'altres comarques perquè això genera un volum de visitants que, de retruc, beneficia els establiments més locals.

També hi ha el temor per la repercussió negativa que poden tenir els locals que queden buits, sobretot si s'allarga el període d'inactivitat com ja està passant en alguns locals del carrer Anselm Clavé –les antigues botiga Asia i Vint-i-tres o la joieria Saetra– o el local de l'antiga perfumeria Causa o d'El Far, al carrer Sant Roc, on després del tancament d'aquests negocis ja hi va haver altres activitats relacionades amb la telefonia.

De fet, l'eix dels carrers Sant Roc i Santa Anna concentra actualment una quinzena de locals tancats incloent els que estan situats a la plaça de les Olles i al tram proper de la Porxada. En els darrers dies, s'hi ha afegit la botiga Africa Complementis, a tocar del mercat de Sant Carles, que ha traslladat la seva activitat a la botiga Africa, situada a pocs metres. Just abans de l'estat d'alarma, ja van tancar les botigues Imaginarium –on des de divendres s'anuncia l'obertura de la botiga AG-25, fins ara a la plaça de les Olles– i Eureka Kids.

En canvi, es treballa a

l'antic local que ocupava la sabateria Mòn Groc, que va tancar el desembre de l'any passat i on obrirà una nova botiga de Bazar El Regalo. La xifra de locals sense activitat al tram més comercial d'Anselm Clavé –de la plaça de la Corona fins a la Fonda Europa– és més reduïda. N'hi ha cinc. Dos més si es compten els locals buits de la plaça de la Corona. Si es té en compte tot l'espai conegut com l'Eix d'Or –part d'Anselm Clavé i l'eix dels carrers Sant Roc i Santa Anna fins a la plaça de la Caserna amb un tram de la plaça de la Porxada i la plaça de les Olles– els locals sense activitat representen al voltant del 13% dels 173 que hi ha en tot aquest àmbit.

Canovelles no cobrarà res a bars i restaurants per tenir terrasses durant l'any que ve

Canovelles

EL 9 NOU

L'Ajuntament de Canovelles va aprovar en un ple extraordinari dijous al vespre suspendre temporalment la taxa d'ocupació de via pública amb taules i cadres que afecta els bars i restaurants que tenen terrasses. Amb aquesta decisió, aquests establiments no hauran de pagar res durant l'any que ve per tenir terrasses a la via pública. També s'ha suspès l'ordenança que regula els impostos que empreses i autònoms han de satisfer a l'Ajuntament per iniciar una nova activitat.

La revisió de taxes i ordenances es va aprovar amb els vots a favor del govern del PSC i d'ERC i Ciutadans, a l'oposició. Canovelles en Comú es va abstenir. Els canvis volen donar suport a comerciants, empresaris i autònoms.

La revisió preveu un increment del 2% de l'impost de béns immobles (IBI) que, en un rebut mitjà del municipi, –350 euros a l'any–, representa un increment de set euros l'any. També puja la taxa d'escombraries, que no es tocava des del 2013. S'actualitza amb un increment del 10%. La nova tarifa serà de 138 euros/any per als pisos i 237 euros en el cas de les cases. En contrapartida, es facilita l'accés a les bonificacions per ús de la deixalleria.

eco-bot
let's talk energy!

Hola! Soc l'eco-bot, el teu assessor energètic d'Estabanell Energia.

Quant he consumit aquest mes fins ara?

97kWh, que equivalen a 13,55€. Vols saber quins electrodomèstics han consumit més?

Apunta't a la prova pilot al Vallès Oriental

Taninim a participar en el projecte europeu Eco-Bot, el teu assessor virtual que et donarà informació detallada sobre el teu consum d'energia i et farà recomanacions per reduir-lo i fer-ne un ús més eficient.

Si ets client d'Estabanell Energia i estàs interessat en participar, contacta'ns o informa't a:

eco-bot@estabanell.cat www.eco-bot.estabanell.cat/participar

*Hi podem participar clients d'Estabanell Energia que pertanyin a la xarxa de distribució d'energia elèctrica d'Estabanell Distribució.

estabanell energia
estabanellenergia.cat

Energia 100% renovable

El projecte està finançat pel Departament d'Enllumenament i Energia de la Generalitat de Catalunya i el Departament d'Enllumenament i Energia de la Generalitat de Catalunya.

Figure 42: EYPESA's press release about Eco-Bot

On the 9th of August, SEC launched an online press release summarising the results of the German pilot. The press release as well as the links to press feedback can be found below. An English version of the press release can be found in the Annex.

+++++PRESSEMITTEILUNG+++++



Intelligenter Chatbot Eco-Bot hilft Privathaushalten beim Energiesparen

Der digitale Energieassistent Eco-Bot, ist ein Chatbot, der in das Energiesparkonto, einer kostenlosen Energiemonitoring-Plattform der Firmen SENERCon und co2online integriert ist. Über ein Menü oder ein Textfeld können Energieverbrauch, Kosten und CO₂ Emissionen einfach und schnell abgefragt werden. Zusätzlich kann überprüft werden, ob durchgeführte Energiesparmaßnahmen erfolgreich waren. Eco-Bot hilft darüber hinaus beim Energiesparen, indem er personalisierte Energiespartipps gibt und berät, ab wann sich die vorzeitige Austausch eines alten Haushaltsgerätes durch ein effizientes Gerät lohnt. Für Haushalte, die einen Smart Meter des Energiedienstleisters Discovery installiert haben, bietet Eco-Bot noch weitere Funktionalitäten, unter anderem wertet er den Verbrauch von einzelnen Haushaltsgeräten aus, ohne den Einsatz zusätzlicher Messgeräte, anhand von künstlicher Intelligenz, die auch bei der Spracherkennung eingesetzt wird - Eco-Bot verbessert selbstständig seine Spracherkennungsqualität.

Eco-Bot wurde im Rahmen des gleichnamigen EU-Projektes entwickelt und getestet (anteilig gefördert über das Programm Horizon 2020), unter anderen in Deutschland von Nutzern des Energiesparkontos. Die Ergebnisse sind vielversprechend: verglichen mit normalen Energiesparkonto-Nutzern, die bedingt durch Lockdown, Homeoffice und Homeschooling 5 Prozent mehr Strom und 2 Prozent mehr Heizenergie verbraucht haben, konnten Eco-Bot-Nutzer rund 2 Prozent Strom und 0,6 Prozent Heizenergie sparen. Nutzer, bei denen ein Smart Meter installiert ist, haben sogar 10 Prozent Strom gespart. Dies könnte ein Argument für die schnellere Einführung von Smart Metern in Haushalten in Deutschland sein. Durch Energieservices wie Eco-Bot könnte auf einfache Weise und geringinvestiv ein Beitrag zur Erreichung der Klimaziele geleistet werden.

Weitere Informationen:

Projekt-Website www.eco-bot.eu (Englisch)

Ecobot@senercon.de

Claudia.Julius@senercon.de

Figure 43: Press release of the German pilot

Press feedback:

<https://www.deutscherpresseindex.de/2021/08/09/intelligenter-chatbot-eco-bot-hilft-privathaushalten-beim-energiesparen/>

<https://www.presseradar.de/2021/08/09/intelligenter-chatbot-eco-bot-hilft-privathaushalten-beim-energiesparen/>

<https://www.openpr.de/news/1215474/Intelligenter-Chatbot-hilft-mit-KI-beim-Energiesparen.html>

<https://www.presse-control.de/2021/08/09/intelligenter-chatbot-eco-bot-hilft-privathaushalten-beim-energiesparen/>

<https://www.presse-blog.com/2021/08/09/intelligenter-chatbot-eco-bot-hilft-privathaushalten-beim-energiesparen/>

<https://www.newstags.de/intelligenter-chatbot-hilft-mit-ki-beim-energiesparen-362334.html>

<https://www.technologiebox.de/2021/08/09/intelligenter-chatbot-eco-bot-hilft-privathaushalten-beim-energiesparen/>

<https://www.immittelstand.de/2021/08/09/intelligenter-chatbot-eco-bot-hilft-privathaushalten-beim-energiesparen/>

<https://www.it-it-prof.de/2021/08/09/intelligenter-chatbot-eco-bot-hilft-privathaushalten-beim-energiesparen/>

<https://www.industriebox.de/2021/08/09/intelligenter-chatbot-eco-bot-hilft-privathaushalten-beim-energiesparen/>

<https://www.pressebox.de/inaktiv/senercon-gmbh/Intelligenter-Chatbot-Eco-Bot-hilft-Privathaushalten-beim-Energiesparen/boxid/1071382>

Two examples of articles, one of a portal targeting SMEs, another of an industry portal for research and development and innovation, are given in the following figures:

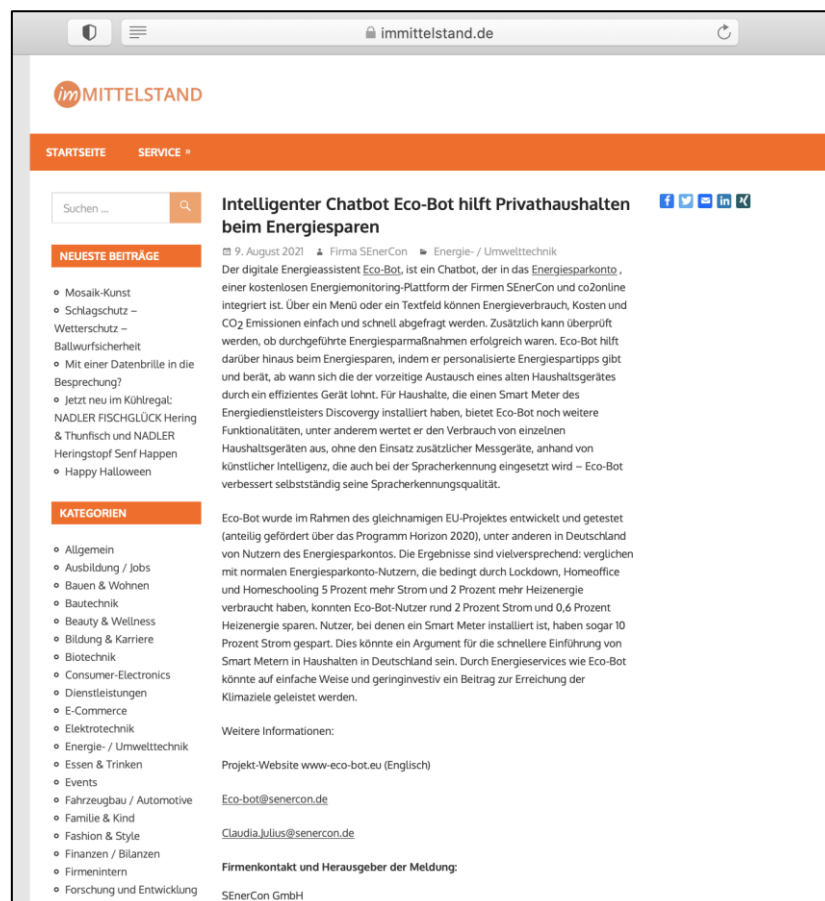


Figure 44: Eco-Bot article on SME portal



Figure 45: Eco-Bot post on industry portal

In February 2020, one of DEXMA's partners which participated in the pilot proposed to send a press release in Catalan to Barcelona's Gremi de Restauració, an association of restaurant owners in Barcelona in order to inform that some of its members would participate in the pilot phase of the commercial pilot and with the objective of recruiting more participants for the pilot. DEXMA completed the initial version sent by JustaEnergia but finally did not obtain authorisation from the partner and finally the press release was not sent.

Els robots entren a l'eficiència energètica

El projecte europeu ECO-BOT, finançat dins el programa Horizon 2020 mitjançant l'acord de finançament núm. 767625, compta amb la participació de diferents empreses tecnològiques que s'han unit per crear un bot de conversa o «Chat-Bot». La iniciativa per crear una nova eina que combina la intel·ligència artificial i la gestió massiva de dades compta amb la participació de RISA, Estabanell Energia, Adelphi Research, ERRA, DEXMA, SenerCon, University of Strathclyde, Plegma Labs i Uniwersytet Ekonomiczny W Katowicach.

D'entre les funcionalitats del «Chat-Bot» cal destacar-ne les recomanacions energètiques personalitzades que envia periòdicament al gestor energètic, la visualització dels 10 millors o pitjors consums energètics, la introducció d'un projecte de mesura i verificació i la comprovació del seu estalvi energètic, la visualització del consum desagregat a cada establiment mitjançant tècniques NILM (*Non-intrusive Load Monitoring*) i la definició d'objectius d'estalvi en termes energètics, econòmics o d'emissions de CO₂.

El nostre partner tecnològic DEXMA, empresa de desenvolupament de software de gestió energètica, lidera dins el projecte ECO-BOT el pilot B2B (*Business to Business*) i JustaEnergia hi col·labora fent-se càrrec de la configuració, proves inicials i fases de test i avaluació de l'eina. Per fer aquesta feina que es desenvolupa en el projecte, s'ha comptat amb la participació de 6 establiments del Gremi de Restauració de Barcelona, del qual en som proveïdor autoritzat de serveis energètics. A més, en les proves pilot també hi participaran establiments hotelers i supermercats del Regne Unit i Itàlia.

Durant un període de 18 mesos, JustaEnergia recollirà i analitzarà les dades de consum de Alsur Café Palau, Andreu, Triki Trac, Xàtiva Muntaner, Taverna del Bisbe i Xàtiva Corts per tal de crear una línia de base i fer, posteriorment, el test de l'ECO-BOT a partir de les dades obtingudes. Els establiments participants seran pioners en l'ús d'aquesta nova tecnologia i comptaran alhora amb una informació valuosa i precisa sobre els seus consums energètics. Aquesta eina suposarà noves oportunitats d'estalvi energètic per als establiments i un considerable estalvi de temps per al gestor energètic. Per a més informació sobre el projecte ECO-BOT: www.eco-bot.eu.

Figure 46: Eco-Bot press release for Barcelona's Gremi de Restauració

4.5.2. Media articles

During the reporting period, the following Eco-Bot related media article was published:

Article published in IEEE Smart Grid eNewsletter

The article "Personalised ICT-tools for the Active Engagement of Consumers Towards Sustainable Energy" by EYPESA presents the concept and objectives of the project and was published in the IEEE Smart Grid May 2021 eNewsletter. The article is available at: <https://smartgrid.ieee.org/newsletters/may-2021/personalised-ict-tools-for-the-active-engagement-of-consumers-towards-sustainable-energy>.

4.5.3. Interview on a national channel

Sylwia Słupik from UEKAT was invited as an expert to the cyclical TV program "This is a case" broadcast by Telewizja Polska together with Dziennik Zachodni. On September 28, 2021, the program will be devoted to the issues of ecology, climate and sustainable energy. Dr. Słupik will talk about, among other things, the Eco-Bot project, and how people in households can save energy, why it is so important and what to pay special attention to during the daily routine. Dr. Słupik will talk about the results of the project, explain the role of IT tools in energy management and present the Eco-Bot application that can facilitate energy savings.

4.6. Training and Education

Education activities for students and training activities for academic projects on the project's research methodologies and results have already been organised by USTRAT as follows:

- USTRAT provides training and education through the following means: individual one-year projects taken up by 4th year undergraduate students (x 3 students), MSc project students project dissertation (x 1 student), contribution to PhD student dissertation (x 2 students), 3-month group project on energy data analytics for 1st year undergraduate students within the Python Programming class (x5 groups of 2 students).

5. Dissemination activities against KPIs

Error! Reference source not found. Table 3 presents the dissemination activities that took place during the period M29-M45, complemented by those performed during the first 28 months of the project, in order to enable direct comparison of the overall progress made with the defined KPI targets. It should be noted that certain activities that were foreseen in the dissemination and communication plan of D6.2 were revisited and refined in D5.1, so as to emphasise the dissemination of pilot findings and user testimonials and strengthen a key stakeholder-focused approach that would maximise the exploitation opportunities. The table presents the progress made against the initial KPI targets that were defined in D6.2, as well as against the new and/or adapted KPI targets defined in D5.1, with the latter being highlighted in light blue.

As shown in the table, despite the unexpected challenges faced due to Covid-19, which resulted in change of plans w.r.t. specific dissemination activities, overall, most of the KPI targets were achieved, and in some cases overachieved, as, indicatively, the number of website visitors (7347 unique visitors while the target was 3500), Eco-Bot videos' views (706 with a target of 500), pilot-related announcements (50 with a target of 21), etc.

As mentioned above, several major events were cancelled or postponed to later dates due to Covid-19, which resulted in the presentation of Eco-Bot in 10 external events in total instead of the 14 initially foreseen. Notwithstanding, the Covid-19 limitations urged the consortium to focus even more on the organisation of online Eco-Bot workshops with targeted key stakeholders, organising in total 16 Eco-Bot events instead of 7 that was the initial target.

As far as the press releases are concerned, although only 2 pilot-related ones were published during the reporting period instead of the 3 initially foreseen, it should be noted that the press release regarding the German pilot was widely distributed and got published on 11 media sites.

The number of published newsletters reached 5 in total, overachieving the initial target of 2 newsletters, however the 4 pilot-related newsletters fell short of the new KPI of 6 pilot-specific newsletters that was set in the revised D5.1. Given that in the revised plan of pilot-related

dissemination activities defined in D5.1 it was foreseen that the next newsletters would be more stakeholder-focused instead of addressing the general public, it was expected that the initial target of 5000 newsletter recipients, intended for general dissemination, could not be achieved by focusing only on targeted stakeholders for the dissemination of the newsletters. Nevertheless, the total number of Eco-Bot newsletters recipients was high anyway and reached approximately 3300, with the contribution of DEXMA, which has an extensive base of more than 3000 subscribers.

As far as the dissemination of the scientific work is concerned, the academic partners achieved both targets of journal publications and presentations in scientific conferences / workshops, while the targets of training and educational activities were overachieved.

Overall, the dissemination activities that have been performed during the reporting period as well as throughout the project's duration, are considered satisfactory and generally in line with the dissemination strategy and plan, and in several cases the targets were overachieved, while a few minor deviations noted were mostly related to Covid-19 implications.

Table 3: Dissemination activities against KPIs

Category	Activity	Monitored parameter	Achieved per period				Timeline and targets			
			M1-M18	M19-M28	M29-M45	Total	Initial phase (M1-M28)	Interm. phase (M29-M36)	Final phase (M37-M45)	Total
Brand identity	Creation of Brand Identity	Project logo	Ready on M2				Ready on M2			
		Project templates (leaflet, poster, deliverable)	Ready on M2				Ready on M2			
Communication kit	Leaflet	Number of leaflets	1	1	2	4	1	1	-	2
	Poster	Number of posters	1	-	-	1	1	1	-	2
	e-newsletters	Number of e-newsletters	-	1	4	5	2	1	1	4
		Number of recipients	-	-	3300	3300	5000	5000	5000	5000
	Pilot-specific newsletters	Number of pilots' e-newsletters			4	4	-	-	6	6
	Promotional videos	Number of videos	-	1	5	6	1	1	-	2

Category	Activity	Monitored parameter	Achieved per period			Total	Timeline and targets			
			M1-M18	M19-M28	M29-M45		Initial phase (M1-M28)	Interm. phase (M29-M36)	Final phase (M37-M45)	Total
	Pilot specific videos	Number of pilots' videos			3	3	-	-	3	3
Website	Project website	Creation of Eco-Bot website	Ready on M4				Ready on M4			
		Number of unique visitors	1445	1558	4344	7347	2000	500	1000	3500
		Creation of pilot-specific pages			Ready				Ready on M38	
Social media channels	LinkedIn account	Number of followers	21	73	161	161	50	120	200	200
	Twitter account	Number of followers	55	82	259	259	50	130	250	250
	YouTube account	Number of video views	-	-	706	706	-	250	250	500
	Partners' individual social media accounts	Number of Eco-Bot related announcements	16	20	15	51	18	9	9	36
	Project's & Pilot partners' social media accounts	Number of pilot-related announcements	-	-	50	50	-	-	21	21
Scientific publications	Publications in journals and magazines	Number of published papers in journals	-	1	6	7	-	2	4	6
	Presentations in scientific conferences / workshops	Number of presentations in conferences / workshops	6	5	2	13	2	4	4	10
Networking and events	Participation in external events (exhibitions, workshops, EU events)	Number of Eco-Bot presentations	9	1	-	10	6	4	4	14

Category	Activity	Monitored parameter	Achieved per period			Total	Timeline and targets			
			M1-M18	M19-M28	M29-M45		Initial phase (M1-M28)	Interm. phase (M29-M36)	Final phase (M37-M45)	Total
	Organisation of Eco-Bot events	Number of Eco-Bot events & webinars	2	-	14	16	At least 7 Eco-Bot events & webinars ⁱ			7
		Number of attending stakeholders	40	-	123	163	20	30	80	130
		Number of non-specialist attendees	-	-	54	54	At least 50 non-specialist attendees			50
Mass Media	Press releases, media articles and interviews	Number of press releases	1	-	2	3	1	2	1	4
		Number of pilot-related press releases	-	-	2	2	-	-	3	3
		Number of media articles	-	1	1	2	1	1	3	5
		Number of interviews	-	1	(1) ⁱⁱ	2	-	-	1	1
Training and education	Educational activities for students	Number of educational activities	6	6 ⁱⁱⁱ	4 ^{iv}	8	At least 2 educational activities for students during the course of the project			2
	Training activities for academic researchers	Number of training activities	5	2	-	7	At least 1 training activity for academic researchers during the course of the project			1

ⁱ The initial target of 6 Eco-Bot events and 1 webinar throughout the project's duration, was adapted to 7 Eco-Bot events & webinars given the Covid-19 pandemic, which resulted in the organisation of online Eco-Bot events during the last phase of the project.

ⁱⁱ Although no interviews were given during the reporting period (M29-M45), an interview is scheduled to be aired on Polish TV on September 28, 2021.

ⁱⁱⁱ 6 educational activities during the period M19-M28, including 4 ongoing and 2 new ones

^{iv} 4 ongoing educational activities during the reporting period M29-M45

6. Conclusions

This deliverable covers the dissemination and communication activities that took place during the final period of the project (M29-M45), thus enabling the overall evaluation of the dissemination performance during the whole project phase in relation to the defined action plan and KPIs.

In accordance with the “Dissemination strategy and action plan” (D6.2), during the intermediate phase of the project, emphasis was given on raising further awareness about Eco-Bot, engaging stakeholders more actively, and starting disseminating the first concrete project results, while, during the last phase of the project, dissemination and communication activities were further intensified.

Moreover, the initial plan was updated in D5.1 with additional KPIs w.r.t. the pilot-related dissemination activities, aiming to follow a more stakeholder-focused approach during the last phase of the project. In accordance with the updated plan, pilot-related dissemination activities were intensified so as to emphasise the dissemination of pilot findings and user testimonials, highlight Eco-Bot's key advantages from the perspective of relevant stakeholders and how these stakeholder groups could benefit from it, thus maximising exploitation opportunities of the project.

Overall, the dissemination activities that have been performed during the reporting period as well as throughout the project's duration, are considered satisfactory and generally in line with the dissemination strategy and the initial plan, and in several cases the targets were overachieved, as, indicatively, the number of website visitors (7347 unique visitors while the target was 3500) and the number of Eco-Bot videos' views (706 with a target of 500), while a few minor deviations noted were mostly related to Covid-19 implications. Strong effort was put also towards the achievement of the additional targets defined in the revised version of D5.1, aiming to follow a more stakeholder-focused approach than initially foreseen, and although certain newly set targets were missed (e.g. 4 pilot-related newsletters were released instead of the 6 planned in D5.1), other newly set targets were overachieved (e.g. 50 pilot-related posts during the last period on social media instead of the 21 initially planned).

ANNEX: Press release of the German pilot (English translation)

+++++PRESS Release+++++



Intelligent chatbot Eco-Bot helps private households save energy

The digital energy assistant Eco-Bot is a chatbot that is integrated into the Energy Savings Account (German *Energiesparkonto*), a free energy monitoring platform of the companies SENERcon and co2online. Energy consumption, costs and CO₂ emissions can be queried quickly and easily via a menu or a text field. In addition, it is possible to check whether energy-saving measures that have been implemented have been successful. Eco-Bot also helps to save energy by giving personalized energy-saving tips and advises when it is worthwhile to replace an old household appliance with an efficient one. For households that have installed a smart meter from the energy service provider Discovergy, Eco-Bot offers even more functionalities, among other things it evaluates the consumption of individual household appliances, without additional measuring devices, using data science. Eco-Bot independently improves its speech recognition quality. It was trained for this at the beginning of the project.

Eco-Bot was developed and tested within the framework of the EU project of the same name (funded in part by the Horizon 2020 Programme), including in Germany by users of the Energy Savings Account. The results are promising: Compared to normal Energy Savings Account users, who consumed 5 percent more electricity and 2 percent more heating energy due to lockdown, home office and homeschooling, Eco-Bot users were able to save around 2 percent electricity and 0.6 percent heating energy. Users with a smart meter installed even saved 10 percent electricity. This could be an argument for the faster introduction of smart meters in households in Germany. Energy services such as Eco-Bot could also make a simple and low-investment contribution to achieving the climate goals.

Further information:

Project website www.eco-bot.eu

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