



C.H.A.N.G.E.R.S.

BEST PRACTICES IN CHANGING HOUSEHOLD ATTITUDES TOWARDS SUSTAINABILITY FOR RURAL SENIORS.

A project outcome of the C.H.A.N.G.E.R.S. project.

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Authors: Anett Papanitz, Tímea Baranyi (CAM)

Brian Restall (PiM)

Roko Padovac, Maša Gorenšek (BSC Kranj)

Viviana Mazzaggio (Eurocrea Merchant)

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Introduction

Exchanging good practices to Change Household Attitudes for a Non-wasteful, Green environment and Energy-consciousness addressing Rural Seniors (C.H.A.N.G.E.R.S.)

This paper is intended to be used by entities planning to develop training on sustainability efforts and to adapt best-practices for adult education. It offers basic guidelines to train households on the themes of Non-wasteful, Green environment and Energy-consciousness. This collection of good examples is based on four short-term joint staff trainings that have been organised between the C.H.A.N.G.E.R.S. partner countries: Hungary, Malta, Slovenia, and Italy, covering three main topics, namely:

- energy efficiency,
 - renewable energy sources and,
 - sustainability
- in households.

Although numerous learning materials are available online, there are social groups who have little or no chance to gain knowledge in these topics. The best way to meet these challenges is to train staff members from partner organisations, who can in turn apply the lessons learned to their customers. Since we did not have the opportunity to tailor the training materials to seniors in the framework of the C.H.A.N.G.E.R.S. project, we can help the stakeholders to change their attitude on vulnerable target groups in terms of training. Therefore, the present Collection of good practices is completed with a Recommendation which serves as a user guide explaining how to undertake adult education trainings for seniors on various aspects of the specific topics above.

Living more sustainably and reducing energy use is nowadays a well embedded principle in most households in Europe; and in some cases, it can offer tangible financial or environmental gains. In order to achieve tangible results, C.H.A.N.G.E.R.S partners remain fully aware that training seniors in sustainability and energy efficiency is essential to make the energy transition possible for this cohort. It also helps address increased public concerns and interest with various sustainability issues such as increased energy consumption and costs, energy import dependence, pandemic shortages, economic instability and more lately with climate change.

However, drawing peoples' attention, inspire them to take action with regard to their energy use, and then to maintain positive participation, are much bigger challenges. Most energy efficiency campaigns suggest practical and simple actions to save energy in daily life - in most cases tips to conserve and save energy which require little or no particular investment. However, a transition to greater energy efficiency or renewable energy sources will require longer and more lasting changes. Besides, energy improvements often in case of energy poverty, often requires some form of investment in new and more efficient appliances, equipment, or technology to improve their thermal comfort and improve their efficiency. These matters and financial outlays can be daunting or overwhelming for specific cohorts, and rarely a political priority beyond the short-term. Engaging training remains an important element to promote and support more sustainable practices. Beyond seeking to promote greater energy efficiency alone, the C.H.A.N.G.E.R.S. project promotes the behavioural change rather than just the necessary investment decisions. Beyond the topics themselves, the project indirectly targets older learners, seniors and adult citizens living in rural areas in the field of energy and

sustainability by addressing their mentors, teachers, and trainers directly. The overarching driving forces and intentions behind creating the C.H.A.N.G.E.R.S project were:

- To transfer energy efficiency knowledge to partner organisations, and ultimately to help adult learners gain significant awareness, energy, and cost savings at their households.
- To provide sustainability & energy training and resources to partner participants.
- To foster a sense of common sustainability/energy goals and foster a sense of common purpose.
- To extend and develop the competences of educators and other personnel who support adult learners.
- To exchange good examples on adult education of the project partners through four short-term joint-staff trainings.
- To promote lifelong learning of staff and open access to the main project outcomes.
- To kick-start a network of similar minded organisations and share best practices and ideas toward improved energy efficiency amongst vulnerable households, while building new relationships with stakeholders.

C.H.A.N.G.E.R.S. partnership collected ideas for adapting the presented materials for rural seniors in the project outcome titled “RECOMMENDATIONS FOR ADAPTING BEST PRACTICES IN CHANGING HOUSEHOLD ATTITUDES TOWARDS SUSTAINABILITY FOR RURAL SENIORS”.

About the Partnership

CAM, is a Hungarian company specialised in education and development of professional awareness-raising material on energy related issues. CAM has great experiences in the field of EE, RES, sustainability, climate change, VET and adult education, and in international cooperation. The C.H.A.N.G.E.R.S. project is coordinated by CAM. www.camconsulting.eu

PiM is a Malta-based SME. As a multidisciplinary research organisation, it believes in the power of human and technology-centred approaches. Its aim is to promote RES, EE and the intelligent use or reduction of energy requirements in Europe through partnerships, awareness-raising, innovation and strategic actions. www.pim.com.mt

Eurocrea Merchant is a consulting and training company based in Milan, Italy. Its mission is to improve the competitiveness of the European society, through business development, training and creation of transnational partnerships. <http://www.eurocreamerchant.it/en/>

BSC is the Regional Development Agency of Gorenjska in Slovenia, which promotes the development of the Gorenjska region and unites 18 municipalities under its auspices. BSC is a connecting link between the regional and national level, cooperating with municipalities, companies and chambers of crafts and entrepreneurship, non-governmental organizations, ministries, and other state bodies. <https://www.bsc-kranj.si/>



C.H.A.N.G.E.R.S.

1) Energy poverty in vulnerable households

Projects in Motion Ltd. (PiM) delivered training on the subject of energy poverty to the partners in order to address some of the abovementioned challenges. Training material was developed during a previous three-year project called SMART-UP - Vulnerable consumer empowerment in a smart meter world. The project directly assisted vulnerable smart meter consumers by conducting research on how to engage with vulnerable households effectively and instigate energy-related behaviour change. Training was aimed at raising consumer awareness of the costs and environmental impacts associated with energy consumption and the opportunities offered by smart metering. Efforts addressed a variety of stakeholders, but primarily energy efficiency staff, consumers, educators and trainers, small and medium sized businesses, as well as government agencies. It has also attempted to understand whether solutions to energy poverty can be found in the provision of energy services and support via public action centres and social workers engaged with this cohort.

Over the course of three years, organisations in France, Italy, Malta, Spain, and the UK worked to train stakeholders on how to identify and assist vulnerable smart meter householders; supported them to deliver advice to these householders; and conducted research to monitor the impact of this advice.

More detailed research reports, training materials and other information are available at www.smartup-project.eu or via the C.H.A.N.G.E.R.S project website.

1.1.) Why is Energy Poverty a concern?

What is energy poverty? When a household is unable to secure materially- and socially necessitated levels of domestic energy services (2015)¹. It is estimated that 1 out of 10 citizens is affected by energy poverty. There is growing recognition at EU and Member State level of the issue of energy poverty, that is, the inability to access adequate energy to heat, cool and power the home. Energy poverty is a distinct form of poverty that is most likely to affect low-income and vulnerable households, and is caused by high energy expenditure, low household

¹ Stefan Bouzarovski, Saska Petrova (2015). A global perspective on domestic energy deprivation: Overcoming the energy poverty–fuel poverty binary. *Energy Research & Social Science*, Volume 10, Pages 31-40. <https://doi.org/10.1016/j.erss.2015.06.007>.

incomes and inefficient buildings and appliances. It is estimated to affect over 34 million households in the European Union² and another 52 million people facing delays in paying their energy bills.³ The impacts of energy poverty on individuals and communities can be devastating, including poor physical and mental health, low educational attainment, social isolation, and reduced economic activity. Here we are concerned with access to energy as a means of maintaining physical and psychological health and well-being, hence perceive energy as a social necessity.

There is a strong case for prioritising assistance to those in greatest need in terms of both financial disadvantage and poor housing conditions. Addressing the growing problem of energy poverty whilst also tackling the urgent and global problem of climate change requires appropriate safeguards and programmes which target assistance to the energy poor to avoid serious detrimental impacts on the most vulnerable in our society. Addressing energy poverty can bring multiple benefits including reduced demand on public health services, reduced air pollution, improved comfort, and wellbeing, and increased economic activity.

For example, although the Maltese climate is usually mild and low winter temperatures are rare, energy poverty is still present and a multidimensional challenge even in Malta. Typical drivers for energy poverty include:

- particular energy needs and practices;
- limited household income (student, unemployed, retired, single or single parent);
- not owning the home - renting;
- limited affordability and ability to access cheaper energy;
- limited efficiency of old built fabric and equipment, which increase consumption; and
- policy marginalisation.⁴

1.2.) Solutions and Results for training energy-poor households

The following are the recommended steps towards planning an energy poverty training campaign, before actually engaging with your potential audience.

STEP 01: Establish training goals and objectives

It is critical that the campaign is clear about the goals it intends to achieve, and provides reachable targets for participants to meet. It should also provide clear endpoints for efforts and attention. Assuring the campaign has clear goals would serve as the basis for the campaign planning and choice of expected measurable outcomes, while providing a communication framework for the campaign. **STEP 01 is valid for all the trainings of the document.**

STEP 02: Define the target group and sector

It is important to make the target group your focus from the very start of your initiative and in particular to gain their support and feedback by applying a bottom-up approach designed to

² Energy Poverty Advisory Hub. https://energy-poverty.ec.europa.eu/energy-poverty-observatory/what-energy-poverty_en

³ Alleviating energy poverty. The Covenant of Mayors. <https://www.eumayors.eu/support/energy-poverty.html>

⁴ Thomson, Harriet & Snell, Carolyn & Bouzarovski, Stefan. (2017). Health, Well-Being and Energy Poverty in Europe: A Comparative Study of 32 European Countries. International Journal of Environmental Research and Public Health. 14. 584. 10.3390/ijerph14060584.

research their needs. It remains important to ensure who your target audience is and to delineate any geographic or operational boundaries for participant or organisation eligibility, the expected timeframes of the campaigns and the types of households eligible for the campaign. Defining these elements will ensure the campaign scope remains focused on the changes you are trying to achieve and clarifies the type of support you plan on providing to campaign participants. It is therefore of utmost importance to take into account the national conditions or baselines regarding energy consumption practices, media preferences of the target group and past local best practices.

Remember that each person's time is valuable and therefore they must be engaged in useful and beneficial ways in order to convince them to participate in the energy saving campaign. This is the time to also establish a marketing, communications and behaviour-change platform that mobilises social workers involved with vulnerable households. Furthermore, powerful branding, the involvement of media, key stakeholders, multiplier organisations and interactive European and national websites were maintained with new content, energy saving advice materials, links and readings, stimulated their involvement and proved to be important for the campaign. **STEP 02 is valid for all the trainings of the document.**

STEP 03: Dedicate campaign resources and develop a communication plan

Campaigns can be run with no or low financial costs. However, in order to achieve meaningful results, it is imperative that the right amount of financial support is provided. Identifying and dedicating financial and human resources at the onset will ensure that you pre-empt setbacks and maintain momentum throughout the duration of the campaign. It is recommended that campaign organisers identify the costs and determine precisely how funding will be obtained and spent. Where possible, try to join forces with other relevant lobby groups interested in energy efficiency, environment, and specifically working with energy poor groupings in order to maximise available resources and achieve common goals. It is also advisable that campaign goals remain simple since households and social workers are typically time constrained, tasked with other pressing issues, and have limited time to engage fully. A campaign which targets one or two specific behavioural changes is usually more effective than a one which attempts to target a multitude of targets.

Decide as soon as possible who in the partner organisations will manage the campaign effectively, and make sure you recruit the necessary number of individuals who have the necessary social and technical skills to support the campaign and its participants on an ongoing basis, for the duration of the campaign. A campaign manager's responsibilities should include:

- Undertaking a literature review of similar energy efficiency campaigns and state of art of the target sector;
- Detailing and executing pre and post-campaign outreach, marketing, and communications;
- Recruiting participants and corresponding with them throughout the campaign
- Collecting, analysing, and reporting data;
- Informing participants about the resources and support provided by the campaign, as well as incentives offered by utilities or other energy efficiency stakeholders;
- Training participants in the use of available resources and providing them with other general support and;
- Supporting household awareness raising events, while enabling networking and socialising opportunities.

This is also the stage when campaign organisers should start establishing a campaign brand and communications plan that is memorable and is easy to publicise. Hitting the right tone with your target group is important when designing tools and material that are effectively going to be used to attract their attention. The most critical elements for developing a communications plan would include emphasising participant benefits for recruiting and personalising energy savings techniques and reports through relatable actions. Furthermore, powerful branding, the involvement of media, key stakeholders, multiplier organisations, a well-designed and interactive website maintained with new content, energy saving advice materials, links and readings can stimulate improved household involvement.

STEP 04: Develop a training programme for energy poor households

Furthermore, always keep in mind the steps that need to be taken to engage the involvement of your target group. It is therefore of utmost importance to take into account the national conditions or baselines regarding energy consumption practices, media preferences of the target group and past local best practices. Remember that each person's time is valuable and therefore they must be engaged in useful and beneficial ways in order to convince them to address some of the achievable goals in reducing energy poverty in vulnerable households. Both the training course for installers and the course for frontline staff must include an element of role play. The role play engages the training participants (installers and frontline staff) in 'real life' scenarios, and participants should be required to provide advice and assistance to a 'live' consumer on how to help reduce their energy consumption.

It remains critical that training conforms to the highest ethical and data protections standards. This is particularly the case for organisations dealing with vulnerable cohorts, ensuring that participants are provided with '**informed consent**' – that they understood what data was to be collected and why. For consent to be valid, the data subject is to be informed in a concise and clear manner on the purpose for processing. Essential information needs to be sufficient for the data subject to be able to give his informed consent at that point in time. Ethical policies and procedures should be fully compliant with national laws relating to data collection and ethical research and certified by a specialised ethics 3rd party.

STEP 05: Provide advice in households

Assist frontline workers to recruit vulnerable households/consumers to the project, gain their informed consent, provide face-to-face energy advice, and complete questionnaires to capture baseline data on energy use. It remains of essence that multipliers employ behavioural and social tactics which encourage improved energy use in building and operational performance, while ensuring **thermal comfort** is improved and where possible, energy savings made. Furthermore, it is imperative throughout the training that participants also learn how to avoid the **stigma** of labelling households as poor when encountering people who have become accustomed to living in conditions that may be perceived as inadequate by society in general, as well as other 'odd' situations which are typically a result of complex socio-cultural and psychological factors.

STEP 06: Monitor the campaign progress and achievements

The SMART-UP consortium collected baseline data and issued a follow-up questionnaire 6-12 months following the initial advice visit to assess the impact of the advice. Some households

also received additional support, intervention and monitoring as part of a more in-depth small-scale pilot. Qualitative, semi-structured interviews were held with stakeholders and some householders. Monitoring of campaign progress and achievements is suggested for all training materials.

STEP 07: Analyse the campaign results

Quantitative and qualitative data should be aggregated and analysed in order to understand impacts, insights and lessons learned. **STEP 07 is valid for all trainings of the document.**

STEP 08: Lobby for mainstreaming energy access within national development strategies.

- Continue working to help responsible authorities focus on and identify those living in energy or fuel poverty.
- Raise awareness of the financial support for energy payments available, national schemes and policies, grant schemes for improving energy efficiency.
- Apply area-based or spatially guided initiatives to tackle energy poverty.
- Support income maximisation schemes to reduce energy poverty.
- Raise awareness of the energy poverty problem and available solutions among professionals.
- Train a broad range of relevant front-line staff in energy efficiency, fuel poverty and maximisation of income.
- Continue investment in social housing improvement works.
- Enforce private rented sector standards, and ensure the energy efficiency of new builds.
- Organise help for vulnerable households during cold weather periods.
- Explore sources of funding available to local authorities to tackle energy poverty.⁵

Further reading

The original training slides used in SMART-UP project can be found online https://www.researchgate.net/publication/305656375_Vulnerable_consumer_empowerment_in_a_smart_meter_world_Energy_poverty_in_Malta

For further reading, please refer to a publication funded by the European Union EC titled “Alleviating energy poverty - Useful resources” (Feb., 2020); which gathers information about energy monitoring tools, guidance materials, recommendations on how to involve citizens in energy poverty projects, and various policy materials.⁶ The EU Energy Poverty Observatory (EPOV) also offers useful resources on measuring, monitoring and sharing of knowledge and best practice on energy poverty. www.energypoverty.eu

The EPOV’s Member State Report for 2019 (May 2020) summarises the latest key aspects of the energy poverty situation in each EU Member State, based on the key indicators and EUROSTAT data, policies, and publications.⁷

⁵ United Nations Development Programme (2011). Towards an ‘energy plus’ approach for the poor. A review of good practices and lessons learned from Asia and the Pacific. <https://www.undp.org/publications/towards-energy-plus-approach-poor-review-good-practices-and-lessons-learned-asia-and>

⁶ “Alleviating energy poverty: Useful resources”, by the Covenant of Mayors - Europe Office. <https://www.eumayors.eu/component/attachments/?task=download&id=806>

⁷ Member state reports on energy poverty 2019 (May 2020). <https://op.europa.eu/en/publication-detail/-/publication/b9a25ba4-9ef6-11ea-9d2d-01aa75ed71a1>



C.H.A.N.G.E.R.S.

2) Energy efficiency

2.1) Problem

Slovenia has a small energy sector, with final energy consumption in 2017 of 4.92 Mtoe (57,242 GWh). Oil (45%) is the main energy source, followed by electricity (24%), renewables (14%), natural gas (12%), heat (4%) and solid fuels (1%) (SURS 2018). Electricity generation can be divided into three parts—hydropower (38%), nuclear power (37%) and thermal power (22%)—that vary slightly from year to year because of weather conditions and the amount of rainfall, which influences generation in hydropower plants. The biggest share of thermal power comes from one coal-fired plant (lignite). Renewables contribute to only a small share of electricity generation, with solar accounting for less than 2%, and even less wind energy (0.02%) (ARSO 2015). Slovenian energy independence in 2017 was 52%.

Renewable energies include wind, solar, biomass and geothermal energy sources. This means all energy sources that renew themselves within a short time or are permanently available. Energy from hydropower is only partly a renewable energy. This is certainly the case with river or tidal power plants. Otherwise, numerous dams or reservoirs also produce mixed forms, e.g., by pumping water into their reservoirs at night and recovering energy from them during the day when there is an increased demand for electricity. Since it is not possible to clearly determine the amount of generated energy, all energies from hydropower are displayed separately.

Hydropower is Slovenia's most significant renewable energy source for electricity generation; biofuels provided the greatest contribution to total energy needs among renewables. Variable renewable energy sources such as solar PV and wind produced 1.9% of electricity in 2019.

At EU level, electricity production from renewable energy sources in 2020 exceeded production from fossil fuels for the first time, according to preliminary data. The bulk of Slovenia's electricity was generated by its only nuclear plant (37%), followed by thermal power stations (30.5%) and hydro power stations (30.4%). A mere 2.2% came from sun and wind, although the share of electricity from photovoltaic systems and wind farms is increasing. A total of 5,600 gigawatt hours of electricity was produced from renewables, the majority by hydro power stations (93%) and the rest by solar and wind power stations.

SOCIO-MATERIAL DYNAMICS OF HOUSEHOLD ENERGY USE IN SLOVENIA

Future growth in electricity consumption must be considered given the expansion of air conditioning and electric vehicles. Energy efficiency measures, in particular insulation of multi-apartment buildings and family houses, serve as a counterbalance to these increases. However, improvements in thermal insulation are usually concentrated in the better-off sectors of the population, while the less well-off are less able to invest in improving energy efficiency of their dwellings.

A significant percentage of households live in energy poverty, primarily because of low energy efficiency of buildings in combination with high ownership rates (more than 95% of people live in their own flat or house) and low incomes. Due to rising prices of heating oil in the last 10 years, there is a tendency to replace oil for heating with cheaper alternatives. While some households use heat pumps and gas, an increasing number choose biomass, as wood is the cheapest option. However, the large percentage of heating with biomass leads to an increasing problem with air pollution.

ENERGY POLICY IN SLOVENIA

The government has worked on a new national energy concept since the autumn of 2014, but the programme has not yet been adopted. The current version focuses on keeping the status quo and preparing for changes in the longer term. Slovenia's vision for the energy sector is gradually to transition to low-carbon energy sources by focusing on efficient energy consumption, use of renewable energy sources (RES) and the development of active electricity-distribution networks. This strategy will likely envisage a strong reliance on nuclear energy and further development of hydroelectric power (Export.gov 2017). While the gas and oil markets are somewhat privatised, electricity production is still in state hands. The major electricity producers in Slovenia, Holding Slovenske Elektrarne (HSE) and Gen Energija (GEN), are fully owned by the state of Slovenia.

Energy efficiency and energy refurbishment of the building stock are perceived as priority measures but are not fully visible in government financial schemes and policies. Energy communities are only slowly entering the discourse.

Trends in National Households Energy Campaigns in Slovenia

National campaigns in Slovenia are run mainly through the national organisations Eco Fund and Energy Agency. Eco Fund has programmes and financial aids for energy efficiency (EE) and RES measures (e.g. energy refurbishment of buildings, replacement of old inefficient heating systems, energy advising, energy poverty alleviation programmes, co-financing investments in RES, subsidies for electric cars).

Energy Agency is responsible for tenders for support schemes for RES projects. The Ministry for Environment is also active in campaigns for cleaner air, targeting air pollution from wood burning. Other non-governmental stakeholders and actors, including utility companies, run campaigns on RES projects and 'prosumer ship' of RES electricity through a net metering scheme, which allows consumers who generate their own electricity to use that electricity at any time. Community groups run campaigns based on community (RES) projects, energy efficiency, energy poverty and sustainable mobility. Apart from being active in the promotion of EE and RES, community groups are also involved in campaigns against fossil fuels and nuclear power.

Slovenia helping to bring households out of energy poverty with EU grants

Owners and co-owners of dwellings in Slovenia can apply for grants of up to EUR 9,620 for home makeovers including the installations of solar water heaters and heat pumps, state-backed Eco Fund said as it launched a pilot project against energy poverty.

Health aspect

The aspect of improving living conditions by eliminating mould and excess humidity is also notable, it added and pointed to the effect on health. The scheme is scheduled to remain open until the end of the year or until the funds are spent. Owners or co-owners with a registered permanent residence at the home that is being improved are eligible for the grant if they have been on welfare for at least nine months before applying. The public call is for single or dwellings with two homes built before 1968. It is also possible to get the funds if the house was extended in line with the law.

Heat recovery bringing families out of energy poverty in Slovenia

Eco Fund is signing contracts with the investor and contractor for works that are yet to be done. They include thermal insulation of the roof, ceiling and façade, new doors and windows and the replacement of the water heating equipment with solar panels or a heat pump. Beneficiaries can install a heat recovery ventilation system. The incentives cover 100% of the cost, but at a maximum of EUR 9,620 including value-added tax. The amount will be determined by the contract and as a pro forma invoice, according to Eco Fund. Energy consultants from public energy advisory network Ensvet will participate in the program, providing information to citizens about the possibilities. They will be involved in the entire investment process, the announcement adds.

2.2) Solutions and Results

2.2.1 REFURB

REFURB is a consortium of 13 partners and several co-operators in a project exceeding border in EU, to inspire homeowners to move a step further with their energy renovations and achieve zero energy renovation. Easy, economical, and efficient. REFURB gives an overview in a one-stop-shop model and establishes local partnerships and energy solutions close to consumers in the participating countries.

The REFURB consortium consisted of knowledgeable companies, partnerships, associations, and local public authorities, able to mobilise the relevant stakeholders in the respective value chains for buildings renovation packages. It had a well-balanced mix of competences and skills and included 13 EU partners from 6 EU participating regions, bringing very large scope of housing types and huge dissemination capabilities with a total of 1,350,000 inhabitants and more than 500,000 homes. The participating regions were South-West-Flanders; Province of Fryslân, Netherlands; Sonderborg and South Denmark; Tartu, Estonia; Halle, Germany; and Gorenjska region, Slovenia.

The REFURB-consortium aimed to increase the renovation rate by bridging the gap between the supply side (building sector) and demand side (homeowners). The ambition was to unburden homeowners, make it easier for them and create one-stop-shops instead of being

confronted with a myriad of parties, contractors, public bodies, etc. The consortium developed a methodology and country roadmaps which will result in dedicated renovation packages for different market segments and regions across Europe, starting with the private residential sector (homeowners). Customizable renovation packages were developed and tested to ensure that they meet local demands and can be provided by local supplier.

KEY LESSONS LEARNED AND RECOMENDATIONS

Customer segments of the nZEB home renovation market

Defining customer segments has its complexities, namely through different dwelling characteristics and different dwellers characteristics. To pass this complexity, a 'matrix' had to be created as means to identify the (six) market segments with high potential for which it makes sense to further develop "compelling offers" for homeowners on nZEB renovation.

Drivers and barriers for nZEB renovation

An interesting lesson learnt was that although similar drivers and barriers were found in the six identified high potential customer segments, local (regional) conditions differ and may play an important role into the weight of each driver or barrier. The local conditions include local legislation, ownership market, subsidy schemes, conditions of the building sectors and its readiness to deliver nZEB renovation, etc.

Demand side (homeowners) aggregation schemes

REFURB analysed 10 existing demand side aggregation schemes. A range of lessons were learned, for example,

- The strength in organising homeowners is focusing on a well-defined customer segment; providing independent tailor-made advice; reduce the burden of a renovation process; give trustworthy information on the benefits of renovation (energy, monetary, other); involvement of a neutral party (i.e. local authority/government); access to financial incentives and clear information on the upfront costs.
- The failure factors in organising homeowners are: weak financial structure of the aggregation scheme; predominantly aimed at raising awareness; insufficient support for the added value of reaching the nZEB renovation standard; inadequate involvement of the key stakeholders in the value chain; the approach to inform and motivate homeowners is too generic, lacking in specific tailor-made information; and high dependence of the aggregation scheme from the external financing and subsidies provision.
- Key strategies to reduce likelihood of homeowners to drop out of their participation in an nZEB home renovation aggregation scheme are: provide personal approach and tailored advice; understand the value of creating kind of 'communities', for example by groups of neighbours; give the long-term perspective on the renovation; quality knowledge on the renovation measures and time planning of the renovation; support the aggregation scheme with a funding plan, from undertaking small-number of nZEB renovations up to scaling up, i.e. a solid business models.

FINAL RESULTS

A **tailored segmentation of the nZEB house renovation market** was developed, by using behaviour study, psychology, sociology, economics, technology, legislation, architecture, building physics and urbanism. This provided an insight into how homeowners decide, plan, and think, and, how this could affect their choice to invest (or not) in nZEB home renovation. As a result, a matrix was used as a tool to design tailor-made segments, which resulted in identification of **high-potential market segments in Europe to design nZEB renovation packages for**: “young families”, “Post-war suburbs with detached houses”, “Empty nesters”, “Terraced houses with a high energy bill”, “Convinced energy savers”, and “Homeowners of multi-apartment dwellings”.

REFURB found that these segments face similar drivers or barriers. However, local critical success factors to tackle barriers and activate drivers for housing renovation differ in the REFURB’s participating regions. It was observed that **local conditions may play an important role**, through local legislation, the mobility of homeownership, subsidy schemes, acceptance of renewable energy, building sector readiness for nZEB, the tradition of staged renovations.

The REFURB project also made an in-depth analysis of **10 existing demand aggregation schemes** based on best practice experiences. Focus was given to analyse their **success factors, fail factors, and how to reduce the drop-out moments** of homeowners. Based on the analysis findings, a set of recommendations on the best way to organize the demand side was provided.

The **customer journey model** was found as the best model to encourage homeowners to invest in nZEB-renovations. Based on the findings of the critical success and critical fail factors in the Customer Journey, the REFURB partners formulated recommendations for continuous improvement of the Customer Journey towards nZEB. REFURB confirmed that the main barriers in the residential sector relate to fragmentation of the renovation offer, resulting in inefficient or only partial solutions. In addition to financial restrictions and unclear benefits, homeowners do not have a structured way to obtain all the necessary information.

REFURB also analysed what is driving homeowners to renovate their home to nZEB, in the eyes of the supply side. Both drivers and barriers were researched. This resulted in a list of categories of demand-side drivers and barriers. **It was found that the supply sides’ perception of the drivers of the demand side is very approximate to the real drivers of the demand side.**

The REFURB project formulated recommendations to which existing renovation solutions can be used in **renovation packages** that are offered to homeowners to stimulate them to renovate their house to nZEB. Out of the examples of one-stop-shop concepts analysed in Europe, the **common characteristics of existing one-stop-shop-solutions** were identified. It was clear that the specific country context determined the success of the one-stop-shop solutions. Furthermore, many of the analysed one-stop-shop-solutions are not isolated initiatives. Most of them are embedded in a much broader programme, project, or campaign, with clear demonstration projects, etc.

Further step towards the REFURB aim was through investigation on the suitable financing constructions specific for energy efficient house renovations. It was found that there are number of financial stimuli to reward homeowners when they conduct nZEB renovation. This can be **coaching, grants and subsidies** for individual energy-efficiency related renovation measures of the building envelope or the technical installations, or **tax stimuli** such as tax deduction for selected renovation measures or tax reduction on a property in case of achieving a certain energy efficiency level with the renovation.

2.2.2 PEACE Alps

PEACE-ALPS tackles the problems related to the implementation of Sustainable Energy Action Plans (SEAPs) or any other energy concepts already endorsed by Local Authorities (LAs) in Alpine Space Area (ASA) by supporting LAs, about 100, in developing concrete actions with an inter-municipal approach. This is the core aim of the project and the way for reaching its main objective: establishing low carbon and climate change (CC) adaptation policy instruments. The project proceeded by identifying local needs using a bottom-up approach, pooling them to create scale economies and then providing centralized solutions at regional level.

To ensure durability to the outputs, a multi-level cooperation on a long-term perspective were put in place. The outputs and experience gained were spread out in the ASA with an effective engagement campaign of new regions interested in developing the same approach and with policy recommendation at EU level.

Climate change is already in place in the Alpine Space Area (ASA) and adaptation and mitigation actions must be taken with even more urgency than in the past. It is well known that local action is necessary to reach low carbon targets at EU level and the Covenant of Mayors and Mayors Adapt Initiatives have been launched directly for the purpose. Such initiatives have stimulated climate action planning, however, stepping out from the mere planning toward their implementation is not easy even for the more experienced. Lack of technical expertise's in the internal staff and the fact that often the actions need economy of scales to be effective, prevent the LAs from concretely implementing those Action Plans viably. The request of pooling common needs with centralized solutions, supporting several Local authorities at the same time in the implementation phase, is, thus, widespread all over the ASA and can give a concrete contribution to the transition toward a low carbon economy.

The addressed topics were:

- 1) Energy management,
- 2) Energy refurbishment of buildings and public light,
- 3) Local adaptation to CC.

These services were set up and tested with a transnational mutual learning process among PPs and involved LAs.

The project set up innovative centralized solutions for several LAs at a time, providing economy of scale and higher quality than the isolated approach of each LA, commonly the standard today. The centralized solutions were set up by the PPs at regional level based on a bottom-up approach in the definition of needs. This approach will ease the implementation process of the action plans saving money and increasing effectiveness.

Examples were: Feasibility studies for bundling investments; centralized energy management systems for LAs; centralised CC risk and impact analysis services. Each centralized solution was designed and fine-tuned jointly with other PPs working on the same topic with a mutual learning approach. Performance indicators for the monitoring of the success of the actions were defined.

The main project result was the implementation of local actions establishing centralized low carbon policy instruments. In the programme area, the project can thus provide the following changes: LAs' better awareness and understanding of climate change problems and solutions; new investments for sustainable energy; public expenditures reduction; capacity building of territorial coordinators in supporting LAs improved and their transnational cooperation networks boosted and enlarged.

Transferability of project outputs can be provided in several ways and to different target groups thanks to:

1) Mutual learning meetings organized at consortium level (twinning internal partnership to be created on a specific topic to develop skills from PPs with a rather high level of experience to a PPs with a rather low one).

2) Bilateral transfer meetings addressed other organizations placed in the AS region, willing to replicate the activities performed and outputs achieved by PPs with an engagement campaign.

3) The involved Observers, multipliers at regional or international level which can promote the project outputs beside the direct impact of the pilot project implementation.

4) The final conference and cross promotion activities with other Alpine Space projects working on similar topics.

5) Recommendation to the EU level (EUSALP included) based on project results and Observers' input .

6) Dissemination activities and publications produced. Durability of the actions in PP's regions will be ensured by the creation of solid networks with LAs and stakeholders based on a long-term perspective and in a way that centralized solutions implemented at regional level can be self-sustained in the future.

PEACE-ALPS has a focus on policy implementation as it creates networks, involves key stakeholders, implements solutions. It contributes to the EU2020 strategy, and it is in line with the foreseen investments in low carbon economy supported by the Regional EU structural funds. Policy recommendations to the EU level (mainly EUSALP) were provided as one of the main outputs.

The project was based on SEAP_Alps consortium and results. With SEAP Alps, 50 SEAPs and 10 Action Plans for Public Investments have been drafted and more than 4.000 technicians, public staff and stakeholders involved in training and dissemination events. The experience gained by the former consortium were capitalized providing a direct jump into the implementation phase of such energy concepts.

Once Action Plans are drafted, it is often evident that LAs are in most cases too small to make concrete actions being effective and feasible. Such lesson is learnt in several projects run by PPs. Centralized solutions are, thus, an answer, but even in this case it is important to build on experiences gained in other projects, such as 2020Together and Data4Action, which was capitalized.

2.2.3 Dynamic LIGHT

The Dynamic Light project - Interreg Central EU, focuses on the reduction of CO₂-emissions and the enhancement of energy efficiency in public lighting. **Public lighting causes ca. 6% of the global CO₂-emissions.** Many conventional lighting fixtures need to be changed to energy efficient lights. However, public authorities lack a strategic approach to convert their lighting infrastructure. **Dynamic lighting has the potential for higher energy efficiency.** The current challenges of dynamic lighting are a missing legal framework for dynamic dimming of lights and higher initial costs compared to standard LED lights. Therefore, municipalities hesitate to invest in dynamic lighting.

But the uprising topic of light pollution and a necessary improvement of quality of public lighting brings dynamic lighting on the agenda, which can contribute to both: the increase of energy efficiency and the quality of stay in city areas. The main objective of the project is to **make a shift from municipal light infrastructure planning towards a modern energy efficient and demand-oriented lighting design, and better light and energy management.** Project results are best relation between highly energy efficient public lighting infrastructure and the quality of stay in urban areas through better light quality. This also implies to harmonize public lighting standards & norms to better meet social needs and make the application of dynamic lighting possible.

Furthermore, it needs capacity-building and awareness-raising for dynamic lighting & energy-saving potentials. The project demonstrates the process of how a city can implement energy efficient lighting starting from the idea and analysis, GIS data mining, strategy development until financial models, procurement rules, implementation, and evaluation. This goes hand in hand with the joint implementation and testing of pilot demonstration investments to prove the benefits and increase acceptance of energy-efficient lighting among end-users and town planners.

KEY LESSONS LEARNED

Merging urban planning and lighting design

- Different types of area like touristic, mountains, parks and industrial areas demanded lot of engagement from all involved staff through preparatory phase, creation of final project and procurement documentation, and finally implementation of investments.
- The designers/technicians need to take into account the social aspects and not just the energy saving standard.
- Implemented pilots in three different municipalities with different types of area like touristic, mountains, parks and industrial areas. We were the only partner who implemented different type of investments/solutions in different locations/municipalities within the project.

Social impact

- Realization of pilot investments contributed to acceptance of dynamic lighting by stakeholders and users in the region.
- Through the pilot preparation we met the specific social needs of citizens related to public illumination.

A good practice that can be easily replicated

- Interests of public lighting in other areas in 18 local communities in our region.
- If final beneficiaries realized impact of final results they will invest extra money and expand investment or prepared other one.

2.2.4 REAAL

Project REAAL – Renewable Energy Across the Alpine Land – was carried out with the help of a Swiss contribution. The project was led by the Regional Development Agency of Gorenjska (BSC Kranj) and involved ten of Gorenjska's municipalities. Through investments in twelve public buildings, the project has **fostered the use of renewable energy and energy efficient systems**. Furthermore, the entire region has gained a better understanding of the many benefits that the use of renewable energy offers by educational and promotional events held throughout the project. In addition, the municipalities involved have enjoyed not only environmental benefits (reduced CO₂ emissions), but also financial savings in heating the buildings (costs reduced in all municipalities involved by 40-50%).

In the first part of the project, the service provider installed new heating systems and/or solar power plants (solar and photovoltaic panels, heating pumps) in six buildings – five primary schools and an indoor swimming pool. By doing so, the participating municipalities of Kranj, Gorje, Žiri, Bled, Kranjska Gora and Gorenja vas–Poljane received a total of EUR 4,220,514, 15% of which they contributed themselves. With the introduction of renewable energy systems, the municipalities have consequently reduced the operating costs of the buildings.

In the second part of the project, further energy-related renovations of six additional buildings were made in another four municipalities – Preddvor, Jezersko, Škofja Loka, and Tržič. The financial volume of all six investments amounted to EUR 696,520, 32% of which was contributed by the municipalities themselves.

OUTCOMES AND LESSONS LEARNED

Reduction of emissions (CO ₂) for approximately 700 tones per year.	
Increase of the energy efficiency and the renewable energy share in % (according targets of National Energy Plan and EU).	
Total heating savings approx: 300.000 EUR/y.	
Percentage of lowering the municipalities' costs of heating: -Average energy cost savings per location: 46%.	
Turnover of local economy from renewable energy and energy efficient projects.	
Increased know-how for new applications.	

Besides all environmental and financial benefits, it has impact on general knowledge about renewable energy systems (RES) and rational use of energy (RUE). Implemented investments in public buildings with already achieved results have impact on knowledge and awareness of involved population in our region, about the role and importance of renewable energy, energy efficiency and rational use of energy for higher quality of living and sustainable development. REAAL project promote usage of RES, energy efficiency systems (EES) and RUE by people living in the region, that, again, – on a long term – will bring more such kind of investments in private buildings and will bring savings to ordinary people and entrepreneurs, too.



C.H.A.N.G.E.R.S.

3) Renewable Energy Sources

3.1) Problem

In the European Union, there are ambitious targets and goals regarding energy, specifically, renewable energy sources. National climate and energy objectives of the Member States are in line with these European goals. According to Eurostat, the share of gross final energy consumption from renewable energy sources reached 22% in 2020 which is above the target level set for 2020.⁸ This is an important improvement towards EU's goal of reaching climate neutrality by 2050.

Although the situation is getting better, the rate of renewables in the energy mix is still insufficient. From economic aspects, we can say that the prices of the renewable technologies are not recoverable yet in short or medium term which can be a major obstacle for households. In addition, the sector of households is responsible for the biggest share in the final energy consumption.

These were the basic challenges which led to the identification of the need for a household handbook that focuses on the renewable energy sources. Instead of creating a general awareness-raising material on the different type of renewables, the focus was on their applicability on household buildings and to provide practical information to the target audience.

3.2) Solutions and Results

METHODOLOGY

The handbook was elaborated in 2017 as part of the [Greening Regions](#) project co-financed by the EEA and Norway Grants. The project aimed to enhance energy consumption consciousness and to spread the use of renewable energy sources in the region.

While the project addressed local businesses, municipal staff and local residents as well, the handbook was especially prepared for the local residents with special attention to women. The professional content is general, thus, it provides help for households who live in a detached

⁸ Source: <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220119-1>

house. As local businesses also appear in the handbook, they can be considered as part of the target group.

The objectives of the handbook were increasing the knowledge of the local residents on renewable energy sources; boosting residential RES investments and providing practical know-how to start and implement such an investment. The structure of the handbook was established together with the Municipality of Mezőfalva, therefore, the handbook could reflect the characteristics of the town and the households, and could introduce local municipal projects related to RES as good practices.

CONTENT OF THE HANDBOOK

The handbook covers three major areas: current situation of energy consumption, advantages of renewables, and practical information. The introduced renewable energy sources included solar panel, solar collectors, biomass and heat pumps. In order to give practical ideas related to the renewables, a model house was used with average characteristics to present different renovation scenarios.

The application of each renewable in buildings followed the same structure. Firstly, their operating principles and types were detailed. After that, costs related to operation and maintenance were explained. Readers could get tips and tricks for planning the installations, and visualisation also supported the better understanding. Lastly, in some cases, where it was applicable, the process of authorization and installation was introduced step by step.

TABLE OF CONTENT:

1. Energy production and consumption in Hungary
2. Renewable Energy Sources in Hungary
3. Application of renewable energy technologies in buildings
4. Related businesses at local and regional level
5. Best practices in Mezőfalva

DISSEMINATION OF THE HANDBOOK

Four short articles were published in the local newspaper presenting the main renewables based on the developed Handbook. The Handbook was also presented for the residents of Mezőfalva at a physical event. At the final press conference of the Greening Regions project, a presentation of the Handbook was held for the audience. Since the closure of the project, the Handbook is available on several websites, only in Hungarian.

OCCURRED DIFFICULTIES AND LESSONS LEARNT

While preparing for the elaboration of the Handbook, the following questions and challenges had to be taken into account:

- **Length of the handbook:** An acceptable page limit had to be defined considering the type and the target group of the document.
- **Applied language:** Scientific terminology and abbreviations were avoided or, if inevitable, explained for better understanding.
- **Amount of statistical data:** Although statistics might justify and can explain the trends of energy consumption, they were limited in the Handbook to keep the attention of the target group.

- **Considering further topics:** Other energy-related topics were considered besides renewables (e.g. e-mobility, energy efficiency elements or biofuels and transport) from which the majority of them were left out to avoid exceeding the length limits.

During the elaboration of the handbook, further challenges arose:

- **Visualisation:** There were not enough available infographics in the topic, especially in Hungarian, therefore, new ones had to be created.
- **User-friendliness:** It was a challenge to create an easy-to-understand but attractive output specifically addressing households, and how to reduce the information to be simple but still valid.
- **Technical details:** For example, the difference between geothermal systems and heat pumps had to be clarified.
- **Pricing:** As part of the practical information, the handbook includes concrete investment costs and other related prices connected to the renewable energy sources. It was challenging to decide on the specific costs, market prices, net and gross costs, etc.
- **Financing:** It was a question if we should introduce available grants and loans for households which could provide both advantages and disadvantages. Eventually, they were left out from the final document not to include data that needs to be updated regularly.
- **Meeting demands of the client:** The handbook was created in cooperation with the municipality, and all their feedbacks and queries were considered and applied in agreement of the parties.

After the elaboration and during its testing and use, several lessons learnt could be concluded:

- During the elaboration, experts of renewables could improve their skills on how to **highlight conclusions** or interesting facts for the average reader.
- In case of public consultations, presenters always have to be prepared for **critics** from the audience.
- Public consultations have to be **well-prepared** in order to attract more local stakeholders.
- According to our experience, **articles in printed newspaper** are great initiations and additions to the Handbook.
- There were **many experts** involved in the development of the Handbook which had benefits and disadvantages, too, especially regarding work allocation and time management.
- It also has to be noted that real-life information and data can become **outdated** easily.



C.H.A.N.G.E.R.S.

4) Sustainable Food Management

4.1) Problem

Every year in Europe, **88 million tonnes of food are wasted**, a total of 173 kilograms per person. The most wasteful are the Dutch (541 kg/person), while the most virtuous are the Slovenes (72 kg/person). Italy, on the other hand, with 179 kg per capita, is just above the European average. These levels of waste are unacceptable if we consider that according to Eurostat, 55 million European citizens - just under 10% of the population - could not afford a quality meal even every other day in 2018. Moreover, by wasting all this food, we are also wasting all the resources used to produce it, such as water, soil and energy. As if that were not enough, the greenhouse gases released into the atmosphere during the production process of all this wasted food must be added to those generated during the disposal of food waste. According to the FAO, 4.5 kg of carbon dioxide is produced for every kilogram of food and food waste accounts for 8% of all greenhouse gas emissions from human activities.

Food waste occurs throughout the production chain, increasing in magnitude as food arrives on our tables from the fields. In fact, it is in our kitchens that most food is wasted: households generate as much as 53% of food waste. At the root of this waste lies misinformation on food preservation, such as the misinterpretation of the wording on expiry dates. "Best before..." is different from "To be consumed by...": improving labels would eliminate a source of confusion for consumers and consequently reduce waste.

Another instrument to be favoured, according to the EU Parliament, is food donations. This would simultaneously reduce food waste and help people in need. But to explicitly authorise food donations and make them a widespread means of combating food wastage, action is still needed from the European Commission.

4.2) Solutions and Results

According to this problem, Eurocrea Merchant has developed two different projects that deal with food waste and food packaging.

1. EFFECT - EUROPE FIGHTS FOOD WASTE THROUGH EFFECTIVE CONSUMER TRAINING



The project specific goal was to develop educational contents to raise awareness of the food waste problem and educate citizens to reduce their food waste footprint. General objective was to improve the offer of high-quality learning related to food management and sustainability, tailored to individual adult learners and delivered through a completely innovative way of outreach. The target group was the whole citizenship in order to educate and shape up “sustainable families” and to make them “responsible consumers”.

The project aimed at reaching all strands of citizens, also those with some financial difficulties, by targeting the educational modules towards specific sub-groups:

- **Families:** the hard core of citizens who can make real changes on consumes and household food consumption.
- **Beneficiaries of food aid and people facing food shortage:** material assistance needs to go hand in hand with social inclusion measures, such as guidance, education and support to help people out of poverty
- **Social workers:** the project offered them methods, contents and tools to actively work as educators about food waste reduction.

Project outcomes

The main outcome was a multifunctional and interactive platform hosting various training contents and tools developed with an innovative approach based on informal learning, education and entertainment. In particular, the platform hosts:

- A learning path including educational materials and methods/scenarios for adult education activities.
- An internet TV, a simple base of short educational video-materials.
- A board-game, available both online and off-line to help people learn about: food products and food processes.
- A networking area, to allow the creation of a community of practice, where organisations active for the reduction of food waste can exchange views, stay in contact, share best practice, and organise educational events using the EFFECT results.

2. EGGS: STUDENTS FIGHT FOOD AND PACKAGING WASTE THROUGH ENTREPRENEURIAL EDUCATION AND GAME-BASED LEARNING



EGGS wanted to develop an innovative, didactical model designed specifically for children to be delivered by Serious Games technology. The project was aimed at promoting entrepreneurial education, active citizenship and game-based learning to engage students in becoming food and package waste activist in order to increase school engagement and prevent Early School Leaving. The project wanted to empower students with new competences and tools to foster student engagement, especially in those areas with a high percentage of foreign born and ethnic minorities groups in order to decrease the level of school drops out and to create a share and common social value for the EU students regarding food and packaging waste.

EGGS aimed at increasing the sense of initiative and the entrepreneurial spirits of students (11-15 years old) in order to increase their school engagement, sense of responsibility and digital competences. Indeed, the project created the EGGS online game where students can learn and play online about how to be food waste and packaging entrepreneurs. The game, not only teaching students about how to reduce food and water waste, labelling and recycling, it also makes them learn by providing real tasks that they have to develop in the real world (especially in school and back home with the family). The scores are calculated in terms of money saved and the social value of the actions. In this way, students can learn by doing their daily actions that can contribute to make the world a better place, and to increase their self-esteem and responsibility. Furthermore, the project was based on active-based methodology increasing also the digital competences of the students.

The aim of the project was to develop an innovative didactic model designed specifically for children aged 11-15, based on serious games technology, a computer game whose purpose exceeds pure entertainment. The eggs game is based on educational content adapted to the age of children and it contains learning materials to reduce food and packaging waste.

The Eggs game also gives children / teens the opportunity to visualize their individual impact on creating a planet with a more balanced system, where the waste is recycled into a product of full value. Students can develop their skills in this area at school (classes, canteens and common areas), during extracurricular activities and after returning home with their families to ensure sustainable consumption and production patterns.

An additional, but equally important, idea behind the creation of the EGGS game is the promotion of entrepreneurship education through play, and thus the prevention of early school leaving (ESL). Students can learn to act as entrepreneurs solving the problems through their community while cooperating and fulfilling the challenges in the game.

The project also provides the three golden rules for workers and students on reducing one's water footprint through diet, without giving up the pleasure of food:

1. Adopt a diet rich in vegetables, pulses, fruit and whole grains.	2. Reduce food waste.	3. Drink plenty of water
• Animal products generally have a greater impact on water resources than plant products. • On average, the water needed to produce 1 kg of beef is four times more than for poultry, more than six times more than for fish, nine times more than for cereals and forty-five times more than for vegetables. • Adopting a sustainable diet rich in vegetables, fruit, legumes and whole grains saves up to about 2,000 litres of water per meal compared to a meat-based menu.	• Every time we waste food, we are also 'throwing away' all the water that went into its production. • By wasting less, we can help improve food security and relieve pressure on natural resources, such as water, that were used to produce the food in the first place.	• Preferring tap water whenever possible. • Drinking from a reusable bottle would ensure greater water availability: for every 1.5 litre bottle of water we buy, we consume an additional 1.9 litres of water for bottling, industrial processes, packaging and transport.



C.H.A.N.G.E.R.S.

5) Sustainable Water Consumption

5.1) Problem

The 70% of freshwater withdrawals are due to agriculture for irrigation and 92% of humanity's water footprint - which includes direct water use, such as domestic use, and indirect use, such as water needed to produce goods and services - is caused by agriculture. An Italian consumes on average about 6,300 litres of water per day, 30% more than a Frenchman, 6% less than a Spaniard and 20% less than a US citizen. 336 litres of water are needed to produce one kilo of vegetables, around 4,615 litres for one kilo of dried vegetables, 6,299 litres for one kilo of pork and as much as 15,139 litres to produce one kilo of beef. As the FAO SOFA 2020 report highlighted, 3.2 billion people live in agricultural areas with high or very high water scarcity, including 1.2 billion (about one sixth of the world's population) in areas where water scarcity is extreme. A problem that - more or less directly - affects us all, given that the annual amount of freshwater resources available per person has decreased by more than 20% over the last two decades.

The FAO points to the Mediterranean basin as one of the global hotspots where a reduction in water resources will occur, with freshwater withdrawals for agricultural use accounting for almost 50% of total water withdrawals. In this scenario, in Italy, with its fairly high per capita water footprint, the most significant risk for the near future will be water availability. And the hidden water also ends up in the rubbish: as the recent Food Waste Index Report 2021 by the United Nations environment programme (UNEP) and the British NGO WRAP highlighted, "Some 931 million tonnes of food, or 17% of the total food available to consumers in 2019, ended up in the waste bins of households, retailers, restaurants and other food services", roughly the same as 23 million fully loaded 40-tonne trucks, which, put in flaps, would circle the Earth 7 times".

5.2) Solutions and Results

In order to minimize this problem, Eurocrea Merchant, has developed the Aquapath Project, together with a consortium of seven partners from six EU countries, providing a good synergy thanks to the qualified mix of transnational, trans-sectorial and interdisciplinary backgrounds, cultures and fields of experts

AQUAPATH - From Local to Global, raising European citizens' awareness for sustainable water consumption project aimed at fostering citizens' awareness (children -tomorrow's citizens- and adults) regarding water consumption in Europe. Taking into account the various backgrounds of the population, the objective was to educate Europeans to make responsible choices and eventually assist the implementation of law directives, which will only become effective when they are followed by a real mind-shift.

The project developed an awareness-raising campaign so that European citizens have the knowledge to act responsibly and affect water consumption. Becoming responsible citizens will require:

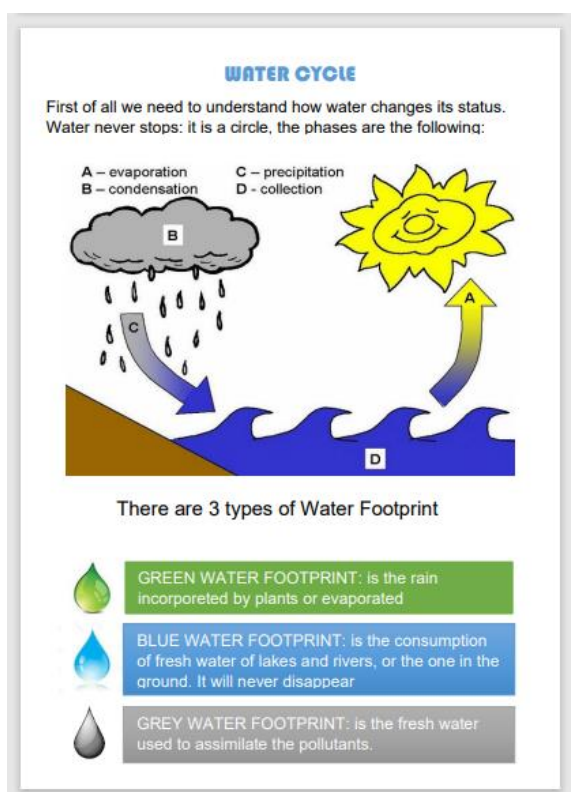
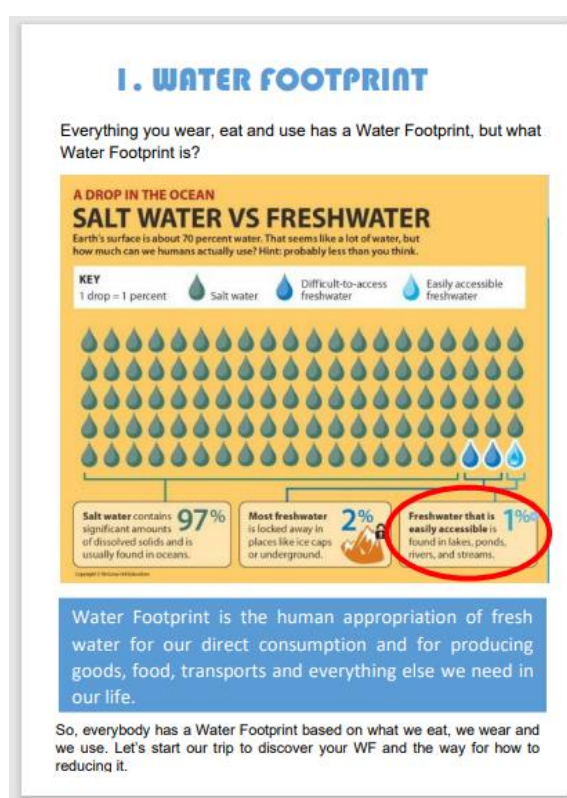
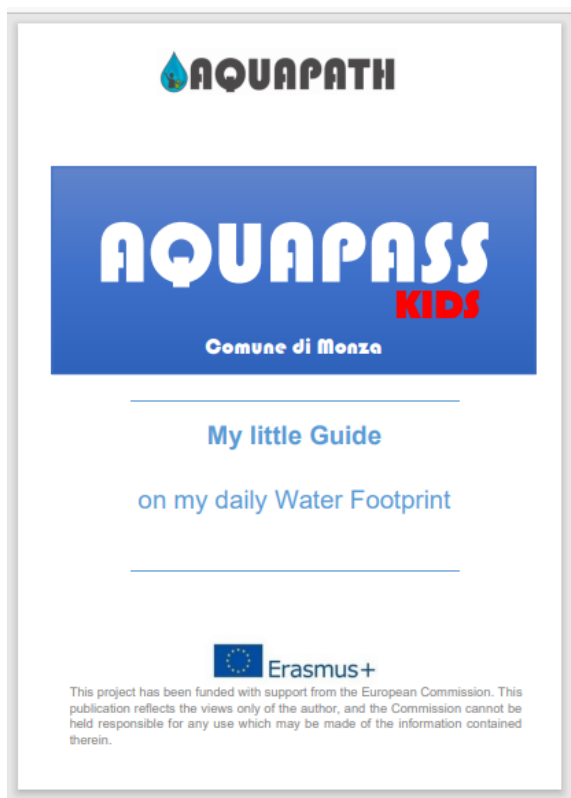
To change consumption habits from products intensive in water to products with small water footprint.

To reduce direct water consumption.

To pressure manufacturers, so they alter their processes and offer products with smaller water footprints.

Several project results were developed during the implementation of the project, for example:

- 1) Development of communication supporting the training materials and tools that are adapted to both publics, children and adults.
- 2) Awareness-raising campaign regarding water consumption led through the following activities and media:
- 3) Web Platform - App – Water Footprint Calculator including practical suggestions for water consumption through a drop-down menu and guidelines for household management; "see-click-fix" tool, etc.
- 4) Hardware training material developed with an informative and pedagogic purpose but having a scientific basis.
- 5) Awareness raising modules for children (through interactive games and cartoons).
- 6) State-of-the-art and training needs analysis.



Source: AquaPass – My little Guide



C.H.A.N.G.E.R.S.

6) Smart Homes and Living

6.1) Problem

It is everyone's wish to be able to grow old comfortably in their own home and maintain their independence even when they are alone. Unfortunately, this is not always possible, because as we get older it becomes increasingly difficult to avoid all dangers in the home. Fortunately, the latest technology is making the home safer and more liveable, even for those who no longer have the skills of their youth.

There are many possibilities offered by so-called smart homes.

Historically, the first mechanisms designed for this category of people are those that allow them to call for help quickly and, above all, automatically in the event of an accident or illness. Nowadays wearable devices with sensors that constantly monitor the health of the elderly person can be connected to an intelligent alarm system that can call for help in case of need - for example, by sending a message or a call to a professional or family member. Or a simple video camera can be connected to a smartphone to allow our loved ones to check on us at all times.

Also related to health, automatic medication dispensers help to ensure that we don't forget the unfortunately long list of medications (each with its own doses, schedules, etc.) that an elderly person typically has to take.

From health we move on to accident and injury prevention. A simple but effective device can eliminate or reduce a common source of accidents in the home, such as having to move around in the dark looking for a light switch, so presence or movement sensors allow lights to be switched on and off as needed, or twilight sensors activate lighting automatically when a room gets too dark in the evening.

More recently, as seen in many advertisements featuring grandparents, devices such as Amazon Alexa, Google Home and the like allow you to control not only lights, but also blinds, television and radio with a simple voice command.

Other common sources of accidents in the home are household appliances: presence sensors installed near the oven or cooker can, for example, allow these to be switched off automatically when the presence of a person in the vicinity is not detected for too long, preventing the danger

that the elderly person, once dinner has been prepared, becomes distracted by other tasks and forgets the fire is lit. Smoke detectors can also be providential for similar dangers.

Let's go one step further: what if we could prevent the elderly from doing all those household chores that are often a source of accidents? The first Hoover robots, now common in homes, will in time evolve more and more into intelligent devices capable of carrying out the most diverse tasks - there is already talk of real 'robot carers', guided by real 'artificial intelligences' coming in the not-too-distant future.

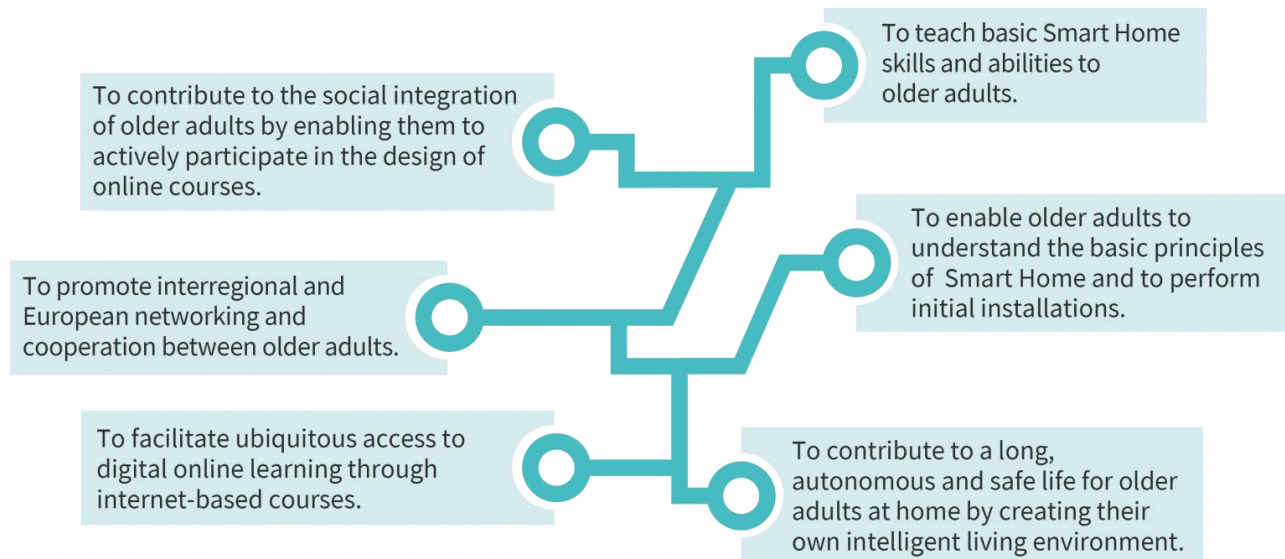
6.2) Solutions and Results

Eurocrea Merchant developed the 'SmartYourHome' project, that had two strong motivations that relate to the needs of older adults:

- 1) Older adults are largely excluded from lifelong learning, as specific training for senior citizens is only offered in urban areas, if at all. However, older adults live everywhere.
- 2) Smart home technologies and services can be of particular benefit to older adults if they are used in a target-group-oriented manner.

The project combined both motivations: Older people were aimed to be enabled to understand the characteristics and possibilities of digitalisation using the example of smart home concepts and to use them actively. This should enable them to remain autonomous in their own homes as long as possible.

The SmartYourHome project goals are:



The activities developed during the lifespan of the project were:

- Preliminary study on the competences and needs of older adults in the field of Smart Home.
- Development of an online learning space on smart home concepts and on the use and application of smart home technologies.
- Development of smart home solutions by older adults.
- Provision of an **online learning platform**, where courses and (learning) materials can be accessed: The online learning content consists of four modules and learning films. The modules in turn contain several learning units. Below, you can get an idea of the contents. To do so, click on the respective course. If you want to find out more and start learning, click on the flag of the country and have a look.
[SYH - Public Outcomes \(ili.eu\)](https://ili.eu/SYH-Public-Outcomes)
- Offered e-tutor training for interested older adults, who would like to share their knowledge with other older adults.

2022

C.H.A.N.G.E.R.S. project

Project number: 2020-1-HU01-KA204-078710

*Exchanging good practices to Change Household Attitudes for a Non-wasteful, Green
environment and Energy-consciousness addressing Rural Seniors*