Report with recommendations and lessons learnt from analysed projects

Dokument powstał jako realizacja działania WP2 projektu LIFE EKOMALOPOLSKA „Wdrażanie Regionalnego Planu Działań dla Klimatu i Energii dla województwa małopolskiego – Pomoc techniczna" (881599 – LIFE-TA-2019) dofinansowanego ze środków programu LIFE Unii Europejskiej.

LIFE IP technical assistance

The review analysis of the reference EU-funded projects

26th of January 2020

The following review analysis presenting initiated and concluded reference projects in the area of climate protection (mitigation and adaptation), and energy efficiency (EE) implemented in Europe (LIFE and non-LIFE), within multi-partner structures in an urban as well as the rural context.

The experiences driven from multiply European projects prove that ambitious climate mitigation and adaptation measures are confronted with two key barriers on the local level:

a) lack of skills and knowledge

b) budget constraint

This major challenge can be overcome! The climate protection leaders among Polish local governments such as e.g. Bielsko Biała, Bydgoszcz, Sztum or Jasło prove that the necessary solution is and establishment of a dedicated role of an Energy/Climate Advisor (manager). Such role is crucial for a successful climate mitigation and adaptation measures on the local level. Those climate leaders among Polish municipalities were joining international networks (e.g. Energy Cities, ICLEI, Covenant of Mayors) and multi-stakeholder projects as a result of Climate Advisor work. This position introduces a climate leadership into the local government structure and delivers understanding of the scale of challenges, necessary ambitions and opportunities related with the low-emission transition.

Successful Climate Advisors use opportunities for peer-to-peer networking, knowledge exchange and capacity building enabling them to gain necessary skills and budgets for multiply soft and hard measures which deliver profound Greenhouse Gas emissions (GHGe) reduction as well as major resilience measures.

Over last few years the role of the Climate/Energy Advisor had been introduced in big and small Polish, pioneer municipalities such as Bydgoszcz (354 006 inhabitants), Bielsko-Biała (170 479 inhabitants), Jasło (36 341) or Sztum (9 945). The successful Climate/Energy Advisors are managing and minimizing the municipal GHGe together with energy costs by: i) **increasing the energy efficiency ii) investments into the renewable energy sources, iii) development of the strategic concept for climate protection iv) engagement of local communities for the climate protection measures, v) fundraising** and **enhancing urban, climate resilience.**

Bydgoszcz policzyła, ile zaoszczędzi dzięki fotowoltaice

18.11.2019 I KOMENTARZE 1

Urząd Miasta Bydgoszczy

Unfortunately, along the success stories there are also examples of lost opportunities e.g. i) The City of Słupsk - where the city government lost the Energy Advisor due to the uncompetitive salary and was not able to employ a high-qualified expert, as well as ii) The City of Bielawa - where the outcomes of the projects conducted by the Energy Advisor were not sufficient to finance this position on the municipal level.

Building on those examples, enable better understanding of challenges and success factors already verified in Polish reality. Further analyses of international practice e.g. Germany National Energy Advisory, or projects such as the European pee-to-peer learning scheme: Bridging European and Local Climate Action (BEACON) or SOLMACC - Strategies for Organic- and Low-input-farming to Mitigate and Adapt to Climate Change, in the rural context can bring additional inspirations.

A comprehensive regional scheme for the successful Climate Advisory on the Voivodship level within the LIFE IP will be built based on the existing recommendations from the variety EU-funded projects along with the lessons learned and case studies from good practices combined with an extensive understanding of the local context as well as the key success factors, recognized within the processes of chosen project implementation. The local climate management at the level of Poviat will enable enhancement of the climate mitigation and adaptation efforts in the urban but also in the rural context. The latter was not covered previously by the climate & energy advisory services in Poland, as currently the few employed Energy Managers are operating mostly in cities.

Source: Project ENGAGE, The City of Bielsko-Biała

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Climate mitigation and adaptation in an urban context

The following chapter analyses successful policies, strategies, programs, projects and measures introduces in an urban context by cities foreseen as leaders of climate mitigation and adaptation in Europe. Special attention is given to the international initiatives, mutli-stakeholder projects which proved successful in Polish context, base on the pilot implementations.

1. Good practice from the City of Bydgoszcz (354 006 inhabitants)

The role of the Energy Advisor in Bydgoszcz (had been created in 2012 as a direct consequence of the **Life + project: LAKS - Local Accountability for Kyoto Goals (2009-2011)** implemented by the City of Bydgoszcz. The main objective of the LAKS project was to demonstrate that local authorities can contribute to the achievement of national and EU environmental goals by creating specific local accountability, management systems, along with introduction of mitigation and adaptation actions aimed at the GHGe reductions. Within the project frameworks the City of Bydgoszcz had conducted its GHGe Inventory covering all the energy sources belonging to the municipality, and proposed actions which would lead towards the 20% GHGe reduction target for 2020. The proposed action plan was to be evaluated on an ongoing basis according to the project objectives. The municipal government soon understood that such task needs a special role to be created in the city and tin result the Energy Advisor was appointed in 2012.

Currently the office of the Energy Advisor in Bydgoszcz hires 4 person and implements multiply soft and hard measures dedicated to climate mitigation and adaptation e.g. enhancing energy efficiency of the municipal buildings' portfolio through thermal-modernization and RES development, (public offices, schools and lately also innovative low-carbon animal shelter) as well as raising awareness, community engagement and behavioural change of Bydgoszcz habitants.

Along the climate mitigation effort, the city is also engaged in several climate adaptation measures. The office is also involved in project fundraising from national and international sources supporting climate mitigation in adaptation measures. Among successfully implemented project in the area of climate protection are:

- **ENERGY@SCHOOL** -energy optimization and behaviour change into schools of Central Europe - ce744, aimed to increase the capacity of the public sector for implementing energy smart schools

- **CitiEnGov - Cities for a good energy governance**, aimed at better management of sustainable energy (energy efficiency and renewable energy) and climate change mitigation amongst public administration in Central Europe through the setting up of energy unit as horizontal service.

- **GRAD- Green Roofs for Climate Adaptation in Urban Areas** (detail description page 20)

Key steps taken by the City of Bydgoszcz and conducted by the Energy Advisor Office:

a) the comprehensive list of the overall public building portfolio, analysing:
   - building structure and the necessary hard measures for energy savings,
   - energy sources, and contracts for the energy supply,
   - energy use and energy bills;
b) necessary investments' plan (along with the necessary fundraising from multiply sources) and the capacity building for building managers and building users;
c) analysis of further measures for GHGe reduction (beyond the public building portfolio);
d) engagement in international consortia, multiply projects fundraising and implementation.

2. Good practice from the City of Bielsko-Biała

The Energy Management role in Bielsko Biała had been introduced in 2003. The first task similarly to Bydgoszcz was the overview of the energy demand and an introduction of the comprehensive energy management scheme for public buildings. Between 2003 and 2006 the Energy Management Bureau of Bielsko-Biała conducted analysis of all the contracts for the heat supply for public facilities (validating prices and especially the ordered capacity). The verification of the ordered power covered 83 municipal public facilities, mainly schools. The calculations were made using the energy database of public facilities (BEN) and enabled the adaptation of energy demand for heating purposes within the determined building portfolio. The calculations indicated the possible reducing in the ordered energy supply by a total of 3 771 kW, which gave savings estimated at over 226 thousand PLN annually**. As clearly stated by the Energy Management Bureau, the verification would not be possible at such low costs if energy monitoring did not exist in the city.**

Since then the Energy Management Bureau was involved in numerous national and international projects aiming at the climate mitigation. **In 2008 Bielsko Biała officially joined the Covenant of Mayors and in 2010 the City Council adopted its first Sustainability Energy Action Plan (SEAP) in Poland,** under the Covenant of Mayors, leading the way towards the local low-carbon transition, with the task of 20% GHGe reduction by 2020 (from 1990 baseline year). By that time, the municipality agreed that the highest reduction potential is in the efficient heating supply, while the main areas of interventions were:

e) thermal modernization of public buildings;
f) behavioural change among citizens;
g) introduction of technologies and equipment supporting the EE;
h) RES development;
i) promotion of sustainable transportation solutions among citizens (public transportation).[1]

Since then the city had been implementing multiply hard measures but the most successful project introduced in Bielsko-Biała is dedicated to soft measures.

In 2011 the city introduced its most recognized and successful initiative aiming at engagement of inhabitants for climate protection: The Good Energy Beskids Festival (Beskidzki Festiwal Dobrej Energii). The festival was part of the international **project ENGAGE**, implemented in

[1] https://docplayer.pl/12854314-Planowanie-i-poczatki-realizacji-planu-dzialan-na-rzecz-zrownowazonej-energii-w-bielsku-bialej.html

12 European countries and funded by the Intelligent Energy Europe instrument (detailed description page 22) . The project aimed at engaging residents of the municipality to work for energy conservation and climate protection. The Good Energy Beskids Festival was the culmination the Energy Management Bureau annual activities. Within the project framework the Municipal Office in Bielsko-Biała acquired 300 Climate Ambassadors, including athletes, musicians, actors, officials, company owners, cultural institutions, the elderly, younger, teenagers and children. Each of the ambassadors created an individual poster with their specific commitment to energy savings and protecting the climate. In October 2011, residents of Bielsko-Biała and other visitors had a chance to see the posters exhibition in the major shopping mall of the city. The Festival was so successful that became a flagship project for Bielsko Biała and the Energy Management Bureau led the 9th edition of the evet in 2019.

Source: Project ENGAGE, The City of Bielsko-Biała

3. The national energy managers scheme -good practice from Germany

The Energy Managers scheme had been successfully implemented in Germany by the Germany Ministry for Environment (BMU) since in 2008. Apart from financing the role of the Energy Manager on the local level the ministry is also directly financing chosen projects.

Since the introduction of this program in 2008, more than 2,000 municipalities have received support for the implementation of over 3,700 projects. A higher level of financial support is provided especially for municipalities struggling with financial problems, to enable this target group investments in energy efficiency and renewable energy sources. Hence, reducing their budgets in the long run. Those municipalities introduce also creative financial instruments to fund climate protection measures e.g. interacting, green public procurement.

Recently, the transfer of knowledge and exchange of experience among local governments has been also supported by the "Local Government Climate Protection" service point financed by the Federal Ministry of the Environment. The office had awarded cities and municipalities that implemented outstanding climate protection activities in the annual national competition. Local authorities deliver energy saving, by buildings thermal modernization, introductions of RES, and promotion of environmentally friendly modes of transport. In addition, climate protection criteria are also included in spatial planning. Cities, municipalities and poviats thus make an important contribution to carbon dioxide (CO2) emissions reduction.

4. The holistic approach towards climate mitigation in an urban context based on the REVIPOWER project recommendations

International experiences from climate mitigation effort in an urban context prove that successful EE scenarios cover wider scope of activities. Within the framework of the project **REVIPOWER – energy and resource efficient neighbourhood revitalization in Polish cities,** the working group of international experts proposed the resource- and energy-efficient urban development and re-development paradigm, covering key areas of interventions:

i) Efficient land use / Sustainable urbanism;

ii) Energy efficient mobility;

iii) Efficient buildings and districts.

Based on the outcomes from the international working group analyses REVIPOWER gathers and analysis existing policies, strategies and practical measures which could be implemented for the energy and resource efficient neighbourhood developments and revitalization. The project delivers also a comprehensive checklist for local government enabling verification of the state of play and the gap analyses of the holistic, multisectoral energy and resource efficiency approach towards urban development.

Source: https://wiecejnizenergia.pl/aktualnosci/eksperci-podpowiadaja-jak-tworzyc-przyjazne-miasta/

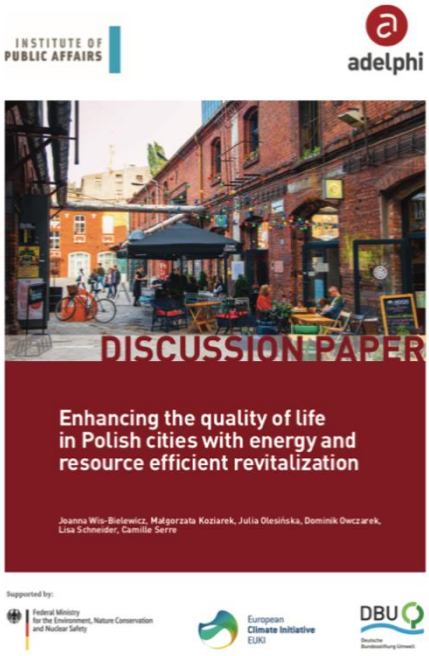
In the publication titled: **Enhancing the quality of life in Polish cities with energy and resource efficient revitalization** conducted within the project framework, authors presented the following, comprehensive scenarios for the implementation of: i) the efficient land use and sustainable urban pattern, along with ii) the efficient urban mobility[2] and iii) energy efficient building and districts -the report is available in Polish and English.

4.1. Efficient land use / Sustainable urbanism

„The total area covered by world cities is set to triple in the next 40 years. If the current inefficient urban development patterns continue, cities will endanger human health and well- being by:

- **threatening the food supplies, sprawling towards the important resources of farmlands;**
- **hindering water security with high demand and outdated infrastructure;**
- **increasing greenhouse gases (GHG) emissions, leading to overpassing the established 2°C average global temperature warming limit and possibly reaching up to an 4°C increase;**
- **contaminating air with heating and transport-based pollution;**
- **hampering economic development.**

According to the estimates by the Global Commission on Economy and Climate costs of urban sprawl for the American economy exceed $1 trillion annually. These costs include increased infrastructure, public service delivery and transportation expenses. Urban sprawl influences the competitiveness of the economy, and hinders private budgets…



… More than 30 years of research conducted by The Urban Land Institute, The New Urbanism movement and the Environment Protection Agency experts prove that the sustainable urban pattern, especially the mixed-use developments, help mitigate the negative effects of urban sprawl and private car dependency, and at the same time, deliver economic, social and environmental benefits.

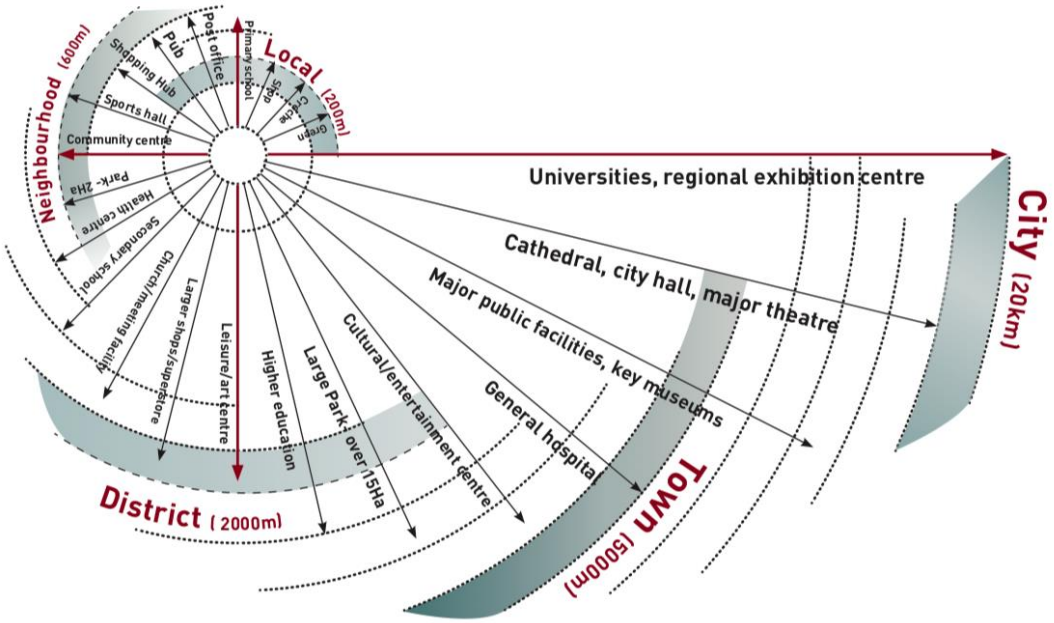
While requiring lower costs per unit infrastructure and public services, the mixed-use communities ensure the following:

[2] Wis-Bielewicz, Joanna; Małgorzata Koziarek, Julia Olesińska, Dominik Owczarek, Lisa Sch- neider, Camille Serre Title: Enhancing the quality of life in Polish cities with energy and re- source efficient revitalization Warsaw/Berlin: adelphi. ENG https://www.adelphi.de/en/system/files/mediathek/bilder/Enhancing%20the%20quality%20of%20life%20in%20Polish%20cities%20with%20energy%20and%20resource%20efficient%20revitalization.pdf

- **improvement of human health by increasing physical activity,** especially when com- bined with development of public transportation systems, along with bicycle and pe- destrian friendly pathways, as well as green, public spaces and playgrounds, (Annual Review of Public Health 2006);
- **minimizing of car dependency and environmental related burden** (e.g. noise, air pol- lution);
- **enhancing of water security and climate change adaptation**, confronting water re- lated climate change disasters such as floods and draughts with green public spaces serving as natural water reservoirs, supporting local small retention, as opposed to outdated water treatment infrastructure build on the principle of pumping the water out of the urban structure.
- **provide significantly higher returns to local governments** through property and sales taxes (Reconnecting America, Center for TOD, 2007).

…Further analysis of the concept of compact, sustainable, energy and resource efficient city approach has provided a list of necessary measures that need to be introduced on neighbourhood, district and city levels in order to support the walkability and biking habits, as well as promote the use of public transport. The two key components of a compact city are: i) **access to local services, amenities and public spaces, (where the maximum proximity to every point of the neighbourhood does not exceed 400 meters); and ii) connectives of every community to a bigger city structure. This solution helps to limit private vehicle usage, dropping it from 20% to even 40% (Urban Land Institute 2008).”**[3]

Figure 5: The list of public and private services along with necessary amenities supporting the compact, connected city structure



Source: Rogers Stirk Harbour + Partners 2014

[3] Ibidem, Wis-Bielewicz, Joanna; Małgorzata Koziarek, Julia Olesińska, Dominik Owczarek, Lisa Schneider, Camille Serre Title: Enhancing the quality …p 10

The inspiring projects building on the concept of sustainable urban pattern for climate adaptation and mitigation is implemented by the City of Wroclaw among others, and is presented in the chapter 5 of this analysis (the project GROW GREEN page 18).

4.2. Energy efficient mobility

„ Urban transport is a significant source of air pollution, chronic congestion and severe risks for citizen safety. Furthermore, it is an important factor that enhances energy demand in urban settlements.

The choice of transport mode is defined by age, type of activity and above all, by accessibility. Within the well-connected communities with easily accessible and reliable public transportation the environmental burden is mitigated, whereas opportunities for local economic development, innovation and healthy lifestyle are enhanced.

Resource and energy-efficient mobility patterns and measures:

- **decrease the levels of private car ownership and influence positively sustainable mobility behavior** (The 2011 analysis conducted in Vauban, a mixed-used community in Freiburg, Germany with 5.000 inhabitants showed that citizens living within the Vauban boundaries had 160 cars per 1,000 people, while in the surrounding neighbourhoods of the Freiburg area, this ratio was 393 to a 1,000. Furthermore, only 16 percent of trips in Vauban were made by car, whereas the tally outside of the neighborhood was as high as 30 percent);
- **limit costs related to chronic congestion**, which in Europe reach as much as 80 billion Euros annually (European Commission 2013);
- **mitigate transport related air pollution**.

Although the revitalization projects are implemented in strictly defined boundaries, they should encompass the overall urban mobility pattern, grant access to several forms of mobility (multimodality) and increase the number of possible connections between various forms of transportation (intermodality).

Successful intermodal projects in Germany connect train stations, bus stops, electric car charging points and car renting stations and biking rental points to offer multiple transportation choices. Moreover, city governments can actively cooperate with local businesses in order to influence mobility patterns of employees by diversifying companies' opening hours - similar solution has been introduced by the City of Białystok to limit the number of buses needed during morning rush hours, yet at the same time to facilitate all transportation needs of factory workers."[4]

The City of Essen had introduced yet another inspiring practice to promote public transportation, walkability and cycling. **The project: "Safe Road to School" project ("Sichere Kinderwege")** was initiated by the Kinderstiftung Essen foundation. Its goal was to create environment supporting cooperation between teachers, external experts and children, aiming at development of successful solutions that will provide children with a safe path to school, both on foot and by bike.

The safe paths for children to travel by bikes and on foot to schools were design in a participatory manner The local government had diminished all discovered barriers and introduced all the necessary measures to enhance the safety on the roads, paths, so children

[4] Ibidem, Wis-Bielewicz, Joanna; Małgorzata Koziarek, Julia Olesińska, Dominik Owczarek, Lisa Schneider, Camille Serre Title: Enhancing the quality… p 13

could use their bikes while traveling every day. The Bockmühle school is one of two places selected for the pilot phase of the project.[5]

Sytuacja przed konsultacjami

Source:https://www.wp.de/kids/kinder-kommen-in-essen-altendorf-jetzt-sicherer-zur-schule-id215684303.html

The **Sichere Kinderwege** is next good practices presented by the REVIPOWER project. The **Sichere Kinderwege** is a German initiative implemented in cities to promote walkability, using another interesting soft measure aiming at mitigating barriers for walkability and cycling are research walks - **Fußverkehrschecks**. The goal of this method is to introduce the concept of the city of short distances in practise. Such active analyse the pedestrian traffic in selected areas through research walks, dialogues with residents, politicians and public administration enabled creation of better condition for pedestrian, not cars-oriented cities.

Pomysł:

Analiza **ruchu pieszego na wybranym obszarze** poprzez spacery badawcze; dialog z mieszkańcami, politykami i administracją publiczną.

Audyt przejścia przez jezdnię

Audyt ul. Emilii Plater

Audyt drogi i jakość nawierzchni

Audyt rowerowy ul. Emilii Plater

Source: https://www.fussverkehrs-check.de

[5] https://www.wp.de/kids/kinder-kommen-in-essen-altendorf-jetzt-sicherer-zur-schule-id215684303.html

Polish cities are also supporting mixed -use community development with safe streets, promoting walkability and cycling. The interesting hard measure in this matter had been implemented by the City of Łódz with examples of investments in Woonerfs and “garden streets”.

W trakcie realizacji 2017 – 2018.

Source: https://dzienniklodzki.pl/woonerfy-w-lodzi-mieszkancy-pokochali-uliczna-rewolucje/ar/12360948

4.3. Efficient buildings and districts.

„ Cities consume up to 80% of global primary energy. Transportation systems, businesses, and buildings need energy throughout their entire life cycle. According to the European Commission, “buildings are responsible for approximately 40% of energy consumption and 36% of CO2 emissions in the EU. Currently, about 35% of the EU’s buildings are over 50 years old and almost 75% of the building stock is energy inefficient, while only 0.4-1.2% (depending on the country) of the building stock is renovated each year” (EC 2018).

Improving the energy efficiency of buildings should become a core element of every revitali- zation process. The enhancement of the building energy performance significantly:

- **reduces risks of illnesses caused by poor indoor climate** (e.g. irritations of eyes, nose and throat, mental fatigue, headache and sleepiness etc. [Univesity ILR 2002]) and enhances the overall comfort and well-being of their occupants;
- **improves energy savings for private budgets** – possible savings might reach up to 50% of household budget (Roadmap 2050) **and helps to mitigate the risk of energy poverty for many disadvantaged households**;
- **stimulates the economy**: according to the EC, the construction industry generates about 9% of Europe’s GDP and accounts for 18 million (direct) jobs (EC 2018).

According to the data gathered by the Central Statistical Office (GUS), in 2011, the total number of buildings in Poland exceeded 6 million, with over 5 million having been built between

1918-2002. 2.2 million of those are located in urban areas and their vast majority has a very high level of demand for final energy and thus should be targeted for thermal modernisation (BPIE 2016)."[6]

Polish local communities were the major beneficiaries of structural funds in the 2014-2020 perspective raising funds for energy efficiency measures such as building thermal-modernization, or replacement of old energy inefficient street lightning among others. Some pioneer municipalities had been also implementing RES solutions in their public buildings.

Good practice of project implemented by municipalities due to the EU funds uptake:

Energy efficient lightning in Cieszyn: Cieszyn is among Polish cities that benefited from EU support enable the local government of Cieszyn to improve energy efficiency. In the years 2017-2019, the city implemented a project worth PLN 6.8 million (with support from the funds of the Regional Operational Program of the Silesian Voivodeship for 2014-2020 reaching PLN 4.5 million). The aim of the project was to replace street lighting with more energy-efficient ones due to the economic and ecological potential of such an investment. Energy-efficient lighting systems allow for the reduction of the electricity consumption by up to 80% (for sodium lamps t up to 50% savings, for LED lamps up to 80% savings). The forecast prepared for the Cieszyn project indicates that the replacement of lighting in the city will allow to achieve savings of approx. PLN 385,000 per year and will also reduce carbon dioxide emissions by approx. 613t per year.[7]

Termal modernization of public buildings in the city of Jasło: the project co-financed by the European Union from the European Regional Development Fund under the Regional Operational Program of the Podkarpackie Voivodship for the years 2014-2020 was aimed at reducing energy demand and improving the energy efficiency of seven public facilities. Modernization works were carried out in three Primary Schools No. 2, No. 4 and No. 11, City School Complex No. 5, the building of the Jasło City Hall and the buildings of the Municipal Sports and Recreation Center (technical building and gym).

The value of the project reached almost PLN 11.5 million, of which support from the ROP amounted to over PLN 8.6 million. The project was implemented in the period between December 2016 and November 2017. As part of the project in the indicated buildings, the city implemented among others insulation of partitions, replacement of windows and external doors, replacement of central heating installations and lighting modernization. In Primary School No. 4, an additional diffuser system with a heat recovery unit was installed.[8]

While the implemented measures deliver ed impressive both energy and economic savings, they were strictly dependent on the external funds. Whether such opportunity will still be possible in future is still uncertain, that is why it is important for the local and regional governments to reach for solutions which will enable climate mitigation even in the context of budget constraint.

Good practice of Innovative financial models- implementing climate mitigation in the context of budget constraints

[6] Ibidem, Wis-Bielewicz, Joanna; Małgorzata Koziarek p.14

[7] http://www.cieszyn.pl/index.php?p=articlesShow&iArticle=10774

[8] https://um.jaslo.pl/pl/projekt-modernizacja-energetyczna-budynkow-uzytecznosci-publicznej-miasta-jasla/

Especially important knowledge exchange activities are connected with solutions which can be implemented without external sources of financing and with a budget constraint. Such schemes had been implemented in many German cities among them The City of Stuttgart (Intracting) but also can be found in Polish cities e.g. Sosnowiec (Energy Savings Contracting-ESCO).

The City of Stuttgart (575 000 inhabitants) was the first in Europe to introduce the innovative scheme of Intracting. In 1995, the City Council of Stuttgart passed a resolution to introduce in the Environmental Protection Office a model for financing energy saving measures. The Office closely cooperated with the finance department in this regard. Through Intracting, the Environmental Protection Office pre-finances energy and water saving measures in municipal offices and facilities, with its own independent budget line. The financial savings obtained in this way go from the budget of the given unit to the Office of Environmental Protection until the full investment costs are paid back. As part of Intracting, over 400 internal agreements with municipal offices and plants have already been implemented in Stuttgart. Most of the activities were developed by The Energy Management Department as part of the energy management system. In result, lighting and heating centres were renovated, control equipment was modernized, and block cogeneration plants were built. In addition, over 30,000 m2 of ceilings have been insulated in urban properties, generating saving 2.5 million kWh of thermal energy annually and reducing CO2 emissions by 514 tons.

The City of Sosnowiec lacking the in-house necessary skills and financing sources had introduced the energy efficiency measures together with the private partner operating as an investor and the implementing body. In 2013 the local government of Sosnowiec had signed a PLN 17 million worth contract with Siemens. The contract was concluded for a period of 10 years on January 22, 2013 as a result of public procurement proceedings carried out in the competitive dialogue mode. The energy management system covered 81 educational buildings supplied with system heating. The investment is being repaid thanks to the savings obtained due to the reduction of energy costs in these city-owned buildings. Interestingly, based on its experience, in 2017 the City of Sosnowiec decided to implement another, innovative project in the similar formula. This time the project was dedicated to residential buildings and implemented in cooperation with Dalkia. The latter is the first residential energy modernization in Poland implemented in the PPP formula. project includes 22 residential buildings with 538 premises and a nursery, in which nearly 1,000 coal-fired furnaces were liquidated.

In both cases the investments are being paid back by the local government from the savings gained from the conducted EE measures.[9]

5. Nature Based Solutions as the climate mitigation and adaptation measures

Nature-Based Solution (NBS) along with the holistic approach towards the EE i proposed by the REVIPOWER, are important solution towards climate mitigation and adaptation effort in an

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https://www.um.warszawa.pl/sites/default/files/attach/aktualnosci/3_sosnowiec_zarzadzanie_energia_0.pdf

urban context. NBS had been introduced by the European Commission and developed by multiply European stakeholders.

Nature-Based Solution (NBS) can contribute to sustainable urban development as well as can address urban challenges such as climate change and water management, while providing multiple benefits to citizens. The high-quality life, better health and the overall well-being of urban dwellers as proved by the above-mentioned publication, conducted within the REVIPOWER framework are directly linked to the green public spaces and the overall accessibility of green areas.

The project **GROW GREEN** implemented in 7 cities aims to create climate and water resilient, healthy and liveable cities by investing in Nature Based Solutions. Making nature part of the urban living environment improves quality of life for all citizens and will help business to prosper. Cities - facing complex challenges associated with climate resilience, as well as a range of social, economic and environmental problems – are partners of GROW GREEN. Four of them – Manchester, Valencia, Wroclaw and Wuhan are implementing the demonstration projects.

GROW GREEN brings the partner cities together on the basis of these similarities but also their differences. Across the 6 European and 1 Chinese City they represent the range of different cities that are found across the world, and the different climate risks that they face. The cities will demonstrate a replicable approach for the development and implementation of city NBS strategies.

“The outcome will be more than simply demonstrating a methodology that works in the partner cities. GROW GREEN will provide the platform for a step change in the way that NBS are embedded in the long-term planning, development, operation and management of cities around the world. The project outputs will be promoted directly to 4-5 follower+ cities in Latin America, Africa and India to encourage them to develop and implement NBS strategies and to 146 Chinese ‘Sponge Cities’. These channels have been designed to create global demand for NBS and to promote European NBS products and services to meet this demand.

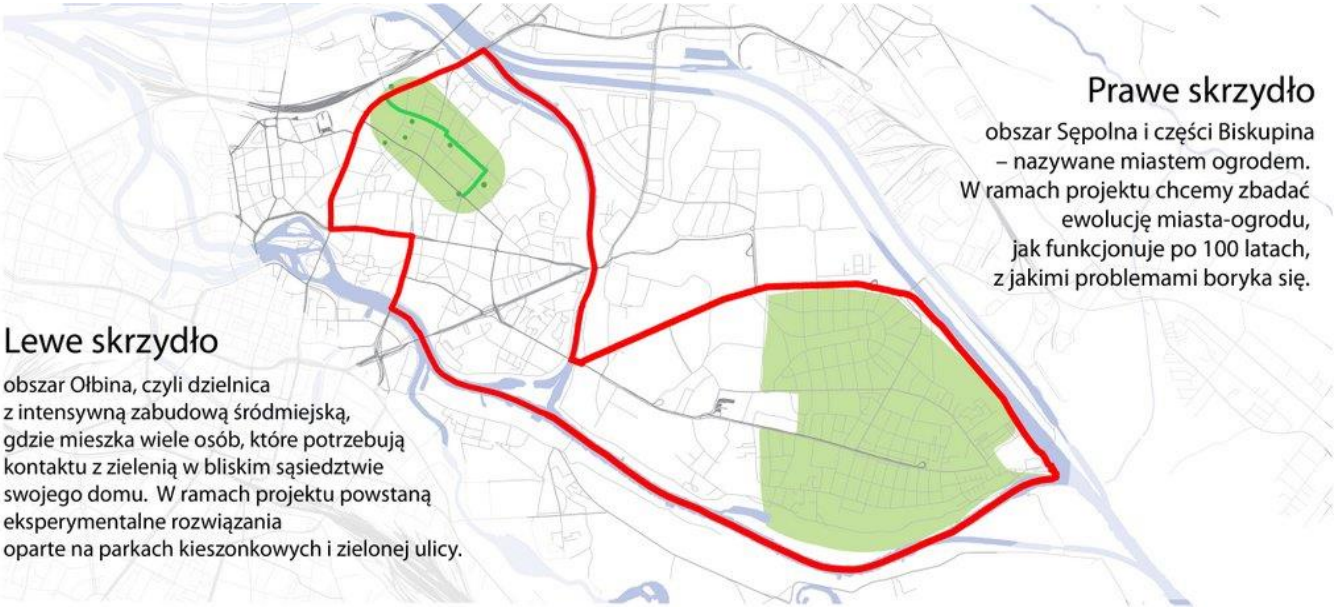
The Polish city Wroclaw is one of the implementing partners introducing NBS into its urban structure as a demonstration model ready to be multiplate in other locations. Wroclaw is actively implementing the GROW GREEN project by introducing the Nature Based Solutions (pocket parks, green streets, green walls, and other systems introducing the microgreen measures into a dense urban structure

In Wroclaw, the project consists of two areas: i) the first Biskupin - called the garden city within the project frameworks the evolution of the garden city is to be analysed and verified how the area is functioning and what problems is facing after 100 years of its creation, the second area (is the Ołbin area, i.e. a district with intensive downtown buildings, where many people live who need contact with greenery in close proximity to their home. As part of the project, experimental solutions for climate mitigation and adaptation inspired by NBS are going will be created in Ołbin. Such as pocket parks and a green street forming micro-green systems. They are to improve the quality of life for inhabitants of this area, support the small retention systems as well as encourage habitants for to change current car-dependent mobility patterns towards walkability and cycling.”[10]

[10] http://growgreenproject.eu

The GROW GREEN proposes interventions into the urban structure of Biscupin and Ołbin in Wroclaw with direct participation of its citizens being an important part of the sustainable urban pattern implementation. Each pocket part is designed by experts together with the local community. The project deploy the innovative participatory solutions such as consultations, “research walks” and “future workshops” among others, to the reflect the needs of the local community in the project design as well as to overcome the car-dependency preferences (in many cases at the beginning of the process the local community preferred more parking lots instead of the proposed pocket parks). The participatory approach enables to raise awareness and sensitize the community towards risks of climate change and needs for climate adaptation.

Source: https://www.wroclaw.pl/growgreen/grow-green-wroclaw



Source: https://www.wroclaw.pl/growgreen/park-kieszonkowy-na-olbinie-drugie-konsultacje

GROW GREEN proposes successful climate mitigation and adaptation measures based on the horizonal approach towards introduction of greenery into the urban context, while another inspiring example the **GRAD- Green Roofs for Climate Adaptation in Urban Areas** project aims to use the potential of roofs and facades for climate mitigation and adaptation measures. GRAD builds on the experiences from the City of Hamburg being used as a German model city.

GRAD foresees the transfer of German experiences and practices in the field of climate adaptation and mitigation to Polish cities. The focus lays upon the development of strategies and solutions to support the creation of green roofs in polish muncipalitie. The project enables the bilateral knowledge exchange among eight Polish cities and The City of Hamburg which will lead to the development of local green roof strategies in those municipalities. The results will be included in further policy documents and the strategies will be promoted via peer-to-peer exchange among other Polish cities. Foreseen capacity building and networking activities

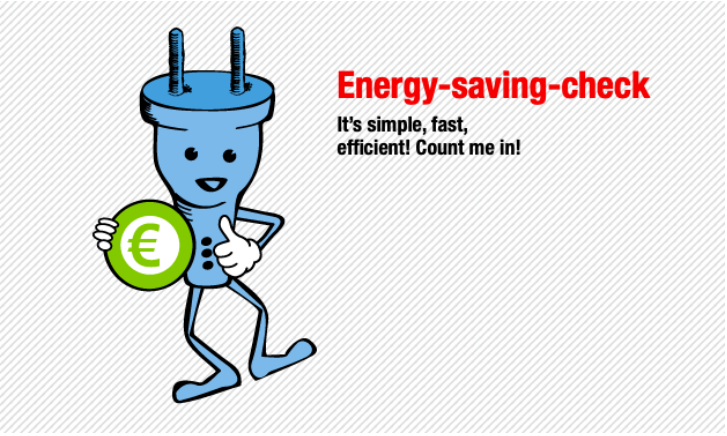
include the organization of thematic seminars, workshops, study trips to Hamburg and the development of an inspirational brochure presenting German good practices in the field of green roofs, climate adaptation and climate mitigation strategies. The activities will be connected with a widespread dissemination campaign to raise public awareness about the positive climate aspects of green roofs.

GRAD was initiated with the study tour to Hamburg organized for the representative of Polish municipalities Warsaw, Kraków, Wrocław, Poznań, Gdańsk, Szczecin, among others. The trip provided an opportunity for representatives of different divisions such as city planning, parks authorities, waste disposal, energy, climate and administration to exchange their knowledge build the capacity. The trip delivered examples of how green roofs can provide additional habitats for animals and plants and recreational space for humans. Green roofs play also a significant role in climate change adaptation measures involving rainwater management, more over Hamburg's' Green Roof Strategy, combines green roofs with photovoltaic and solar thermal energy. The city has established an urban funding programme with over €3 million to support the construction of green roofs with additional RES solutions. The following step within the project timeframe Polish municipalities will receive funds and experts support to develop their own green roofs strategies.

6. Advisory, capacity building and public participation, energy poverty mitigation

Stromspar-Check the project is implemented by the German Caritas and funded by the German government and dedicated to energy saving in disadvantaged households. **Stromspar-Check offers** a free of charge energy and water check for recipients of social benefits and low-income families. Trained energy-saving helpers visit households, exchange lightning (towards energy efficient solution, and advise on energy consumption (verify existing kitchen appliances etc) and thus deliver reduction of energy costs by an average of 172 euros per year. The process is framed around three at-home visits.

The energy saving team comes to a private house and checks the electricity consumption. The households get the first tips on how they can save electricity and thus cash in the household. On a second visit to the energy-saving team, delivers free emergency aids such as energy-saving and LED lamps, switchable power strips, TV standby switches, timers and jet regulators for taps, which can also be installed immediately if required. In addition, the household receives an individual electricity saving schedule and qualified tips on they can further reduce their electricity consumption with simple means.



The energy saving helpers who come to advise habitants at their home are hired by Caritas Germany, and fully qualified for this advice. Over 100 hours of training and daily work practice make them experienced advisors who can help in saving energy. As former long-term unemployed, the energy-saving helpers know from their own experience the everyday problems of low-income households.[11]

Along activities aiming at the energy savings in disadvantage household there are also

[11] https://www.stromspar-check.de/stromspar-check/im-ueberblick.html

interesting projects engaging youth for climate protection for example he **EURONET 50/50.** This pan-European project has proved to be a huge success also in Poland. Its innovative formula is still used by many Polish local governments. The goal of the EURONET 50/50 project was to reduce energy consumption in schools and other public buildings by using an innovative 50/50 methodology that actively engages students, teachers and other building users in the energy management process and teaches them ecological behaviour through specific actions, such as room temperature measurement, room ventilation with the radiators turned off, etc. The financial savings achieved in this way are divided equally between the school and the entity responsible for the school finances -usually local government.

Across Europe, over 500 primary and secondary schools, including over 140 from Poland, initially took up the challenge. As part of subsequent editions of the project, over 250 Polish schools have joined the network, of students who track every manifestation of energy waste and ensure efficient use of resources. Students of these schools form so-called energy teams, whose task is to thoroughly examine the building's energy situation, propose energy-saving solutions and integrate the entire school community into ecological activities. Each year of the 50/50 methodology implementation in the involved schools, the project proves that saving energy pays! Calculations from 2014-15 show that over 65% of schools saved an average of 11.6% of energy per year (between 8 and 15%), which sums up to around EUR 2,760 per school per year (half goes back to school!) And means a reduction of 12t CO2.[12]

The international project **ENGAGE,** implemented in 12 European countries and funded by the Intelligent Energy Europe instrument is yet another inspiring case of public engagement for climate mitigation effort. The project aimed at engaging residents of the 12 European municipalities among the Polish city Bielsko-Biała to work for energy conservation and climate protection. As the culmination part of the project the Energy Management Bureau of the Municipal Office in Bielsko-Biała acquired 300 Climate Ambassadors, including athletes, musicians, actors, officials, company owners, cultural institutions, the elderly, younger, teenagers and children Each of the ambassadors found an individual poster with their specific commitment to saving energy and protecting the climate. In October 2011, residents of Bielsko-Biała and other visitors Galleries located in the mayor shopping mall could see this huge commitment at the photo exhibition located in the arcades. As the culmination of multiply communication and education activities conducted within the project framework the Energy Management Bureau had organized, as a project culmination the Good Energy Beskids Festival. The event was so successful that became a flagship communication and educational project for Bielsko Biała and the Energy Management Bureau led its 9th edition in 2019 engaging over 1000 citizens.

The engagement of citizens for the adaptation efforts was also introduced by the city of Warsaw, Within the framework of the Life funded project **ADAPTCITY,** [13] Warsaw had conducted a numerous of public consultation of its Climate Adaptation Plan and raise awareness of its citizens around challenges related with climate protection and resilience.

[12] http://www.euronet50-50max.eu/pl/about-euronet-50-50-max/what-is-the-euronet-50-50-max-about

[13] http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5067

The main aim of the project was to reduce the negative impact of climate change on the city ecosystem of Warsaw and to use the Warsaw experience to encourage other Polish cities to undertake actions for climate change adaptation. The proposed actions include drawing up an adaptation strategy for Warsaw, which aims to prepare the city authority and citizens for climate change resilience and enhance the adaptation measures in Warsaw.

As a consequence of the project, the local government realized that the urban structure and citizens of Warsaw faces major risk of draught, hence the local government is promoting and creating enabling conditions for private small retention projects to be implemented in Warsaw. Soon a special fund is to be introduced for the city dwellers to install small retention solutions in their own plots.

The City of Warsaw together with The Sendzimir Foundation introduced the map of current small retention project as an inspiration for future investments.[14]

Climate mitigation and adaptation in the rural context

Humans exploit more than 70% of the Earth's ice-free surface, and more than a quarter of land globally is suffering degradation as a result of human activities. Soil is being lost up to 100 times faster than it is formed, and desertification is growing year on year. Temperature increases and heavy rains associated with climate breakdown are further degrading already damaged soils (IPCC2018).[15]

[14] https://sendzimir.org.pl/publikacje/mapa-miejsc-sprzyjajacych-retencji/

[15] http://theconversation.com/ipccs-land-report-shows-the-problem-with-farming-based-around-oil-not-soil-121643

Agriculture now occupies half of the plant-habitable surface of the planet, uses 69% of extracted fresh water and, together with the rest of the food system, is responsible for 25 – 30% of greenhouse gas emissions. Through its direct and intermediate impacts, the food system is the largest contributor to the depletion of biodiversity. In 2012, the Food and Agriculture Organization of the United Nations (FAO) estimated that by 2050 we will need to increase food output by 60% based on a business-as-usual scenario. Such expansion rates pose a serious risk of farther transgression of the fragile planetary boundaries. Hence, there is a pressing need for sustainable solutions within the food production and consumption processes.

The European Commission is actively working on policies, strategies and measure supporting sustainable foot production along with climate mitigation and adaptation efforts for rural areas. The common agricultural policy (CAP) offers a number of instruments to find adequate answers to the challenges of climate change, and more sustainable EU agriculture. “From 2015 onwards, the CAP introduced a new policy instrument, the Green Direct Payment. This 'green payment' is granted for implementing three compulsory practices, namely **crop diversification**, **ecological focus areas** and **permanent grassland**, whose environmental benefits on biodiversity, water and soil quality, carbon sequestration and landscapes have been proven. It represents 30 % of the direct payment budget. As the green direct payment is compulsory it has the advantage of introducing practices that are beneficial for the environment and climate change on large part of the utilised agricultural area. Building on these compulsory elements, rural development continues to play a pivotal role in achieving the environmental objectives of the CAP and combating climate change. The rural development policy objectives are translated into priorities at EU level. Two of these objectives directly concern environment and climate change:

- Restoring, preserving and enhancing ecosystems dependent on agriculture and forestry
- Promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in the agriculture, food and forestry sectors”[16]

The following chapter presents the sustainable, climate-friendly pilot projects implemented in rural areas by the rural municipalities and the European farmers themselves to support sustainable, climate friendly agriculture in the EU.

The project **RURES -promote the sustainable use of renewable resources and energy efficiency in rural regions** sets to exploit the potential of renewable energy sources (RES) and energy efficiency (EE) in rural regions as they have a great potential for reaching energy autonomy. **RURES** is a project funded by the Interreg Central Europe mechanism and implemented in six countries Croatia, Czech Republic, Hungary, Poland, Slovenia and Germany. Poland is represented by the Association of Municipalities Polish Network “Energie Cités” and the Paleczinca Municipiality.

The **RURES** project inspires EE/RES development by the awareness raising, capacity building and the pilot project implementation in the rural areas of Central Europe. Within the project framework, project partners initiated:

- creation of the local support group composed of all relevant stakeholders acting as a regional energy network for implementing energy efficiency plans,

[16] https://ec.europa.eu/info/food-farming-fisheries/sustainability-and-natural-resources/agriculture-and-environment/agriculture-and-climate-change_en

- overviewed best practices of alternative financing models for EE/RES measures which become the basis for new feasibility studies on how to implement energy efficiency plans in the chosen areas,
- developed of the EE/RES calculator tool (for municipal taxes and other incomes) was designed highlighting advantages of a community-oriented regional development and further underline the benefits and added value generated by exploiting energy efficiency and renewable energy,
- implementation of pilot projects.

Among the pilot projects promoting EE/RES development implemented in the rural municipalities are:

a) Intelligent water metering for public water system in Pałecznica

As pilot action it is foreseen to install intelligent (automatic) water metering (IWM) at the water distribution system of the municipality of Pałecznica. For full functionality of the system there is necessity to implement a network of ICT connections, which can synchronize work of all elements of water and PV installations. The system will help with optimization of PV energy, to use it as effective as possible during filling water storage tanks. Water saving thanks to on-line (at real time) metering shall reduce around 20% of water consumption.

b) Establishing a renewable energy-yard

The pilot investment foresees the creation of an Energy-yard in a former school building, in order to promote the utilization of RES and raise awareness around the energy consumption, EE and the overall RES potential. Pilot includes smaller wind power plant; solar power plant; solar collector; vegetable oil fed mini power plant. The produced energy will be used for community purposes. Each element is developed with a capacity that can represent a detached house of average size (100 m2) and average energy consumption of usual family (2 adults, 2 children).[17]

SOLMACC is a LIFE-co-funded project that runs from 2013 to 2018.

The projects' ambition was to demonstrate whether by applying optimized farming practices organic farming can be climate friendly. 12 demonstration farms were involved in the project adjusting their farming techniques under the close supervision and monitoring of agricultural scientists.

[17] https://www.interreg-central.eu/Content.Node/RURES.html

Agriculture has a vital role in mitigating greenhouse gas (GHG) emissions, while at the same time needing to overcome the significant technological, social, and economic challenges posed by the expected increase in global food demand, (bio) energy production, and the impact of climate change on agricultural production itself. Agriculture directly contributes about 10% of European anthropogenic GHG emissions (2012). Many mitigation approaches are currently under investigation, and it is clear that many different strategies will be required to lower GHG emissions in agriculture significantly.

Organic farming practices are considered to have a potential for GHG mitigation through enhancing soil carbon stocks, reducing soil derived N_2O emissions by a generally lower nitrogen input, and by providing various co-benefits including building capacities for climate change adaptation.

Within the framework of **LIFE-co-funded project, SOLMACC - Strategies for Organic- and Low-input-farming to Mitigate and Adapt to Climate Change, f**rom 2014 to 2018, 4 Swedish, 4 German and 4 Italian organic farmers within the framework implemented and verified a set of climate-friendly practices on parts of their farm.

Each SOLMACC farm applied four agricultural strategies to reduce greenhouse gas emissions;
- optimized on-farm nutrient management,
- crop rotations,
- tillage management and
- agroforestry.

Each practice was evaluated for their climate change mitigation and adaptation potential, as well as their socio-economic and technical feasibility, and associated co-benefits. The experiences from each farm are presented in the brochure. The experience from the project proved that the farms' greenhouse gas emissions was reduced compared to average farms with the undertaken actions. Other co-benefits such as positive impacts on soil quality, biodiversity and resource conservation were demonstrated along.

TOWARDS GREATER CLIMATE CHANGE MITIGATION & ADAPTATION OF THE AGRICULTURE SECTOR

CLIMATE BENEFITS OF ORGANIC FARMING

NO USE OF SYNTHETIC FERTILIZERS, leading to reduced Greenhouse Gas (GHG) emissions that are linked to the production process and transportation of synthetic fertilizers.

LOWER NITROGEN AND PHOSPHOROUS INPUT SYSTEMS, minimising nitrogen and phosphorous losses via runoff and volatilisation, leading to reduced eutrophication and water pollution and lower nitrogen levels per hectare, lowering nitrous oxide emissions.

LOCALLY PRODUCED LIVESTOCK FEED, leading to decreased GHG emissions from the production and transportation of feed outside of Europe, as large quantities of soya are currently produced on deforested land to feed livestock in the EU.

INCREASED BIODIVERSITY, both cultivated (agro-biodiversity) and wild, providing many ecosystems services such as pollination, leading to increased resistance to pests and diseases and to more resilient agro-ecosystems.

HIGHER SOIL CARBON SEQUESTRATION AND SOIL FERTILITY AND QUALITY, leading to increased offset of emissions and greater adaptation to climate change effects as organic carbon in soil maintains soil productivity and structure, and as organically managed soils have higher water capture and retention capacity.

HIGHER NET INCOMES, certified organic farmers can sell their products for higher prices, while often incurring lower input costs than conventional farmers, leading to greater economic resilience and therefore ability to adapt.

POTENTIAL OF CLIMATE-FRIENDLY FARMING PRACTICES

OPTIMISED ON-FARM NUTRIENT RECYCLING
Composting on-farm materials such as manure and residues from crops help to close nutrient cycles and reduce GHG emissions, such as methane. Biogas plants produce alternative energy and heat sources, and biogas slurries can be brought back to arable fields and used as fertilizer. Mobile livestock systems can be constructed to reduce GHG emissions from feed transport.

OPTIMISED CROP ROTATIONS
Introduction of or increased percentage of grain and forage legumes such as soya, winter peas and lupines lead to increased stabilisation of soil fertility, nitrogen fixation, and carbon sequestration. Energy and fossil fuel consumption can also be decreased by changing crops and machinery used.

OPTIMISED TILLAGE SYSTEM
Different forms of tillage systems can be adopted, such as reduced frequency, reduced depth or no-tillage, and the type of machinery used can be changed. This can lead to reduced fossil fuel consumption and helps to promote healthy soils.

AGROFORESTRY
Agroforestry elements, such as boundary hedges, buffer stripes, alley cropping or silvopasture, have a high potential to sequester atmospheric carbon, while the wood can be used for heating purposes, replacing fossil fuels. These systems also provide valuable ecosystem services.

POLICY RECOMMENDATIONS

- Set up long-term national and regional plans, both for 2030 and 2050 climate action in the agriculture sector, in line with international agreements such as :he Paris Agreement and UN Sustainable Development Goals (SDGs).
- Use the Common Agricultural Policy (CAP) to encourage the uptake of climate relevant measures by farmers and move away from the "food security" narrative: the principle of public money for public goods in the CAP would allow farmers to take up climate-friendly measures and to reduce other environmental impacts in a more integrated way.
- Aim to reach sustainable levels of livestock production by reducing livestock feed imports and encouraging grazing on well-managed grasslands.
- Demand side measures, as consumers need to be incentivised to adopt sustainable diets.
- The EU should engage in a fooc systems transition and move agriculture towards agroecological approaches such as organic farming. A flagship research programme on agroecology must provide funds for an optimal assessment of multi-functional farming systems, for scaling up the best agroecological systems and integrating them into a coherent supply and value chain.

Source: http://solmacc.eu/wp-content/uploads/2018/05/632-SOLMACC-Leaflet

III. REFERENCE Projects

Policy

Project: LAKS - LOCAL ACCOUNTABILITY FOR KYOTO GOALS (2009-2011)

Lead partner: Comune di Reggio Emilia
Type of organization: Local Authority
Partners: Comune di Padova, Italy Ajuntament de Girona, Spain City of Bydgoszcz, Poland Agenzia Regionale Prevenzione e Ambiente dell'Emilia-Romagna (ARPA), Italy
Duration: 01-JAN-2009 to 31-OCT -2011
Budget: 1,304,758.00 €
EU Contribution: 652,379.00 €
Programme: LIFE (LIFE07 ENV/IT/000451)

Objectives:
The main objective of the LAKS project was to demonstrate that local authorities can contribute to the achievement of national and EU environmental goals by creating specific local accountability, management systems, and mitigation and adaptation actions for GHG reductions. The project worked to enhance knowledge, skills and awareness at the political level, of the potential of local knowledge, skills and awareness at the political level, of the potential of local action to contribute to climate change mitigation. A process of developing local responsibility was started, through the definition of targets and the implementation of a monitoring, reporting and evaluation system. In this context, the LAKS project aimed to support four cities on a long-term basis to significantly reduce GHG emissions, including the increase of the local authorities' capacity for planning, managing and reporting their commitments.

Results
The LAKS project developed a local system for greenhouse gas (GHG) accountability consisting of a series of tools and methodologies. The project actions were implemented in four cities of medium size, in Italy (Reggio Emilia and Padova), Spain (Girona) and Poland (Bydgoszcz), in order to define a simple-to-implement and standard system that could potentially be used all over Europe.

More information:
http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=3238&docType=pdf

The summary of the work implemented by the Energy Advisor office of the City of Bydgoszcz:

http://pnec.org.pl/images/stories/2019/20191029/prezentacje/12._Bozena_K._NAPIERALA__Bydgoszcz_Wydzial_Zintegrowanego_Rozwoju.pdf

Project: CitiEnGov - Cities for a good energy governance

Lead partner: SIPRO Development Agency-Ferrara (ITALY)
Project Partners: City of Bydgoszcz (POLAND), Energy and Innovation Centre of Weiz Ltd. (AUSTRIA), City of Split (CROATIA), Municipality of Grodzisk (POLAND), Goriska local energy agency, Nova Gorica (SLOVENIA), Hajdu-Bihar County Government (HUNGARY), Local Energy Agency of Gorenjska (SLOVENIA), Sinergis srl (ITALY), City of Ludwigsburg (GERMANY)Project
Duration: 1- JUN- 2016 – 31-MAY- 2019
Budget: € 2.150.000,00
Financing programme: Interreg Central Europe 2014-2020

Project objectives:
The project will lead to a better management of sustainable energy (energy efficiency and renewable energy) and climate change mitigation amongst public administration in Central EU through the setting up of energy unit as horizontal service, or the enhancement of the functions of these units where already existing. In addition, the proposal is coherent with the specific objective and it will do this by:
- identifying best solutions to establish the unit within public authorities;
- promoting the share of experience and approaches for SEAP monitoring and implementation; developing ICT solutions for the best exploitation of energy data already available but not always used correctly or shared; investigating and testing incentives to strengthen energy policies and strategies.

Project result:
The improvement of public authorities' capacities to define and implement low carbon energy planning and strategies. Seven pilot actions are tested in seven Countries, targeted to citizens, schools, Municipalities. The CitiEngov project has tackled issues linked with energy efficiency and RES use from the Public Authorities perspective, both aiming at establishing sustainable structures within the administrations with the aim to coordinate activities and initiatives related to energy issues, as well as providing operative tools enabling those activities. This includes the setting up of permanent organizational structures (Energy Units/ One Stop Shop Energy Service Centre). Moreover, the concept and operative approach for the setting up of Energy Units and One Stop Shop Energy Service Centre represent a necessary step also to foster a model based on a collaborative approach with the territorial stakeholders. The training schemes implemented have contributed to the enhancement of the institutional know how and the creation of new positions, more skilled and technical, within the involved authorities. In relation to this, the adoption of overall 26 new energy tools (including SEAP, SECAP, Energy Plan) assures a long- term approach and a formal commitment for the next years. The creation of the online CitiEnGov Toolkit is a source of information and practical solutions enabling the transfer of good and bad practices in the Programme area and beyond it. On the other side the technical solutions tested by the project, ranging from the Energy dashboard (meant to support the decision-making process) and the public lighting system, are important tools whose durability is linked with data availability and optimization of economic resources of the interested Municipalities. It is also important to underline that CitiEnGov has also dealt with the citizens involvement to improve energy behaviour.

More information:

https://www.interreg-central.eu/Content.Node/CitiEnGov.html

https://www.bydgoszcz.pl/rozwoj/projekty-miedzynarodowe/citiengov/

Raising awareness, capacity building engaging community for climate protection

Project: ENERGY@SCHOOL: Energy optimization and behaviour change into schools of Central Europe - ce744

Lead partner: Union of municipalities of Low Romagna Region
Project Partners: CertiMaC s.c.r.l, The City of Bydgoszcz (Poland), Regional Energy Agency Savinska Saleska i Koroska (Slovenia), The City of Karlovac (Croatia), The University of Bolonia The Faculty of Chemistry (Italy), The City of Szolnok (Węgry), Lokalny Samorząd Miasta Ujszilvas (Hungary), The City of Stuttgart (Germany), The City of Klagenfurt (Austria), Energy Agency Graz (Austria), The City of Celje (Słowenia)
Programme: Interreg Central Europe 2014-2020

Project summary

The building sector has a high potential for energy optimization. In terms of public buildings heritage, energy consumption in schools is the is the second highest expenditure of municipalities' total running costs. This sector offers potentially remarkable achievements in terms of energy efficiency and the application of renewable energy sources (RES) and carbon footprint reduction. At the same time, disparities exist in central European regions regarding planning and implementing performances of proper sector-based strategies, action plans and managerial capacities.
ENERGY@SCHOOL aims to increase the capacity of the public sector for implementing energy smart schools. The project will achieve this by applying an integrated approach that educates and trains schools staff and pupils to become Senior and Junior Energy Guardians (EGs).

Main objective

Main ENERGY@SCHOOL objective is to increase the capacity of public sector to implement Energy Smart Schools, by application of an integrated approach that educate and train schools staff and pupils to become Senior and Junior Energy Guardians

Main Outputs

- 1 Common/Transferrable and 8 customized Strategies for Smart Schools
- 1 joint and 7 customized Energy Smart-school Management Plans
- 3 smart phones APPs for EGs
- 8 tested pilot solutions of EE&RES application in schools under direct contribution of EGs, in the form of Guidelines, Toolbox, Best Practices as reference documents and experiences to capitalized far beyond project end.
- 24- training & education programmes will be provided as adaptable & replicable models for capacity raising and Energy Culture rooting.

The project will be realized by the following work packages
The project achieves this by applied an integrated approach that educated and trained schools' staff and pupils to become Senior and Junior Energy Guardians (EGs). The project provided: - 1 transferrable and 8 customized strategies for smart schools; 1 joint and 7 customized energy smart-school management plans;3 smart phones APPs for EGs;8 tested pilot solutions of energy efficiency and RES application in schools under direct contribution of EGs, in the form of guidelines, toolbox, best practices as referenced documents and experiences.
All of the above-mentioned activities have contributed to increased awareness of energy optimization among children and teachers involved in the implementation of the ENERGY@SCHOOL project, which in consequence caused changes in behaviour. The project involved 41 schools and enable training for 246 key actors responsible for the school energy management.

More information:
https://www.facebook.com/EnergyatSchool
http://www.interreg-central.eu/ENERGYATSCHOOL
Tomasz Bońdos - email: tomasz.bondos@um.bydgoszcz.pl, +48 52 58 59 177

Project ENGAGE

Project partners:
12 pioneer cities from 12 different European countries: Heidelberg (DE), Ivanić-Grad (HR),Oeiras (PT),Helsinki (FI), Pamplona (ES), Rennes Métropole (FR), Växjö (SE), Liège (BE), Rimini (IT), Heerlen (NL), Leicester (GB), Bielsko-Biała (PL)
Programme: Intelligent Energy Europe (IEE)

Project summary
ENGAGE was a pan-European communications initiative that seeks to engage citizens and stakeholders at a local level to play their part in building a sustainable energy future. Local authorities will use ENGAGE as a communication tool to share the **Covenant of Mayors** objectives within their territory.

Initially, a core group of 12 cities from 12 different European countries was pioneering the project; these are all signatories to the Covenant of Mayors. The cities' local administrations face the challenge of facilitating communications – which need to render participation both feasible and desirable – to mobilise its municipal departments and as many of its stakeholders and citizens as possible so that the objectives are jointly achieved through a grassroots bottom-up process. The resulting success of the cities' actions should serve to inspire an additional 150 European local authorities to participate in ENGAGE.

The approach of ENGAGE was to develop and implement an efficient participative communications campaign, which leads to tangible energy savings. The campaign needs to be ultimately measurable and deliver quantifiable results. Inspired by Heidelberg's **"Klimasuchtschutz" local campaign,** posters with visible ENGAGEments have been chosen as the core communications channel to raise awareness of the campaign. These posters had a common European identity and were produced via an online tool available in 11 European languages. One key performance indicator to gauge the success of the campaign is the recruitment of at least 3,300 stakeholders and citizens to feature in

the posters across the 12 cities. The project supported collaborative work among local administrations, stakeholders and citizens facing similar challenges in different European countries.

More information:
http://www.citiesengage.eu/en/WHAT-IS-ENGAGE

Enhancing the EE in buildings

Project: EURONET 50/50

Project partners:
Barcelona Provincial Council (coordinator), Spain;
University of Vaasa (VEI), Finland; UfU - Independent Institute for Environmental Concerns, Germany; HERAKLION, Greece; Lake Balaton Development Agency, Hungary; ALESA Srl, Italy; Polish Network Energy Cites, Poland; ALMADA, Portugal; KSSENA, Slovenia.
Programme: Intelligent Energy Europe (IEE)

Project summary:
This pan-European project has proved to be a huge success also in Poland, its innovative formula is still used by many Polish local governments.

The goal of the EURONET 50/50 project was to reduce energy consumption in schools and other public buildings by using an innovative 50/50 methodology that actively engages students, teachers and other building users in the energy management process and teaches them ecological behaviour through specific actions, such as room temperature measurement, room ventilation with the radiators turned off, etc. The financial savings achieved in this way are divided equally between the school and the running body, financing its energy bills, hence the name of the methodology.

Across Europe, over 500 primary and secondary schools, including over 140 from Poland, initially took up the challenge. As part of subsequent editions of the project, over 250 Polish schools have joined the network, whose students track every manifestation of energy waste and ensure efficient use of resources. Students of these schools form so-called energy teams, whose task is to thoroughly examine the building's energy situation, propose energy-saving solutions and integrate the entire school community into ecological activities.
Each year of implementing the 50/50 methodology in the schools involved proves that saving energy pays! Calculations from 2014-15 show that over 65% of schools saved an average of 11.6% of energy per year (between 8 and 15%), which is EUR 2,760 (half goes back to school!) And means a reduction of 12t CO2.

More information:
http://www.euronet50-50max.eu/pl/about-euronet-50-50-max/what-is-the-euronet-50-50-max-about

Project: Modernization of urban properties in terms of energy efficiency the City of Stuttgart through the financial instrument of intracting- the City of Stuttgart

Project Lead:
Environmental Protection Office of the City of Stuttgart
Total budget:
Duration: 1995- ongoing
Budget: Own funds

Project summary:
The city of Stuttgart (575 000 inhabitants) was the first in Europe to introduce the innovative scheme of Intracting. In 1995, the City Council of Stuttgart passed a resolution to introduce in the Environmental Protection Office a model for financing energy saving measures. The Office closely cooperated with the finance department in this regard. Through intracting, the Environmental Protection Office pre-finances energy and water saving measures in municipal offices and facilities, with its own independent budget line. The financial savings obtained in this way go from the budget of the given unit to the Office of Environmental Protection until. Hence, the full investment costs are paid back. As part of intracting, over 400 internal agreements with municipal offices and plants have already been implemented in Stuttgart. Most of the activities were developed by the energy management department as part of the energy management system. However, the managers of individual buildings, whose ideas were often implemented - were also initiated with energy saving initiatives - after their professional assessment by the energy management department. In this way, lighting and heating centres were renovated, control equipment was modernized, and block cogeneration plants were built. In addition, over 30,000 m2 of ceilings have been insulated in urban properties, saving 2.5 million kWh of thermal energy annually and reducing CO2 emissions by 514 tons.

Adaptation

Grow Green- Green Cities for Climate and Water Resilience, Sustainable Economic Growth, Healthy Citizens and Environments

Project partners:
City partners: Manchester (UK), Valencia (Spain), Wroclaw (Poland), Wuhan (China), Brest (France), Zadar (Croatia) and Modena (Italy)
Academic partners: University of Manchester (UK), University of Cambridge (UK), Wroclaw University of Environmental and Life Sciences (Poland), University of Valencia (Spain)
Civil society partners: Tecnalia (Spain), International Union for Conservation of Nature, Greater Manchester Combined Authority (UK), Leitat (Spain), Manchester Climate Change Agency
Business partners: Bipolaire, Ouishare, Trinomics, The Guinness Partnership

Duration: 1JUN2017- 31MAY2022
Programme: Horizon 2020
Overall Budget: € 11 486 746,50
EU contribution: € 11 224 058,25

Project summary:
GROW GREEN aims to create climate and water resilient, healthy and livable cities by investing in nature-based solutions (NBS). Making nature part of the urban living environment improves quality of life for all citizens and will help business to prosper. High quality green spaces and waterways provide innovative and inspiring solutions to major urban challenges, such as flooding, heat stress, drought, poor air quality and unemployment and will help biodiversity to flourish.

By embedding NBS in long term city planning, development and management, accessible green and blue spaces are a permanent feature of all urban areas around the world, creating harmony between people, economy and the environment, for the benefit of all.

The frontrunner cities of Manchester (UK), Valencia (Spain), Wroclaw (Poland) and Wuhan (China) and the follower cities Brest(France), Zadar (Croatia) and Modena (Italy) are currently inhabited by 12.7 million people and sit at the heart of wider metropolitan areas which are home to 17.8 million people. All cities already experience flooding and heat stress, with projections for these issues to increase due to climate change and ongoing development. Working in complex, resource-constrained urban environments, the municipalities for each city have committed to delivering joined-up, cost-effective, smart

solutions to address these and other urban challenges. They recognise that the cities of the future will need to achieve more with less resources and deliver genuine sustainable development that realises a broad range of social, economic and environmental objectives. Each city believes that nature-based solutions (NBS) are a critical part of this approach.

GROW GREEN brings the partner cities together on the basis of these similarities but also their differences. Across the 6 European and 1 Chinese City they represent the range of different cities that are found across the world, and the different climate risks that they face. The cities will demonstrate a replicable approach for the development and implementation of city NBS strategies.

The outcome will be more than simply demonstrating a methodology that works in the partner cities. GROW GREEN will provide the platform for a step change in the way that NBS are embedded in the long-term planning, development, operation and management of cities around the world. The project outputs will be promoted directly to 4-5 follower+ cities in Latin America, Africa and India to encourage them to develop and implement NBS strategies and to 146 Chinese 'Sponge Cities'. These channels have been designed to create global demand for NBS and to promote European NBS products and services to meet this demand.

Project objectives:

Grow Green is a five-year project with the following objectives:

1) Contribute to the evidence base of nature-based solutions in cities for cost-effective, replicable means of increasing urban climate and water resilience, social, environmental and economic benefits, to underpin the development of NBS policies and the global NBS market

2) Develop an easy-to-use replicable approach to support the development and implementation of NBS strategies in cities, aligned with existing city priorities

3) Support the creation of the required conditions to support, drive and enable the implementation of city NBS strategies by awareness raising and capacity building in cities around the world, supporting the development of the required policy framework, business models for investment in NBS and the global market for NBS.

Through NBS demonstration projects and partnerships with a group of cities across Europe and China, Grow Green will develop a replicable approach to the development and implementation of NBS strategies at city level. A further six cities will be supported in using this approach to produce their own NBS strategies.

Informed by these experiences, Grow Green will support the creation of the conditions needed for implementation of city NBS strategies globally. This will be done by building awareness and capacity, supporting the development of appropriate policy frameworks at a range of levels, developing viable business models for investment in NBS, and supporting the development of the global market for NBS products and services.

More information:
http://growgreenproject.eu/partners/

GRAD- Green Roofs for Climate Adaptation in Urban Areas

Project Lead: Association of Municipalities Polish Network Energie Cites (PNEC)
Project Partners: Free and Hanseatic City of Hamburg
Duration: OCT-2018- September-2020
Budget: 163,110 €
Financing programme: European Climate Initiative

Project objectives:
The aim of the project is to develop strategies to spread roof and façade greening in eight Polish cities. Thereby, they build on the experience of Hamburg as a German model city, which has not only used roof greening to reduce CO2 but also to improve the climate of the city.

Project summary:
The project foresees the transfer of German experiences and practices in the field of climate adaptation and mitigation to Poland. The focus lays upon the development of strategies and solutions to support the creation of green roofs. Established bilateral exchange with the city of Hamburg will lead to the development of eight local green roof strategies for eight Polish cities. The results will be included in further policy documents and the strategies will be promoted among other cities to encourage them to take similar action. Foreseen capacity building and networking activities include the organization of thematic seminars, workshops, study trips to Hamburg and the development of an inspirational brochure presenting German good practices in the field of green roofs, climate adaptation and climate mitigation strategies. The activities will be connected with a widespread dissemination campaign to raise public awareness about the positive climate aspects of green roofs.

The project was initiated with the study tour in Hamburg organized for the representative of polich municipalities from Warsaw, Kraków, Wrocław, Poznań, Gdańsk, Szczecin and smaller communities. The trip provided an opportunity for representatives from a variety of fields such as city planning and parks authorities, waste disposal, energy, climate and administration to share their knowledge and experience. The trip showed how green roofs can provide additional habitats for animals and plants. In addition to offering a habitat for flora and fauna and recreational space for humans, green roofs play a significant role in climate change adaptation measures involving rainwater management, more over the y the Hamburg Green Roof Strategy, for example using green roofs as an open space and combining photovoltaic and solar thermal energy. he city has established an urban funding programme with over €3 million to support the construction of green roofs and energy combinations, In the next step, the Polish partners plan to develop their

own strategies for green roofs with support of the landscape architect funded by the project and the knowledge gained during the study tour.

More information:
greenroofstrategies.eu/

Holistic approach toward the EE in an urban context

REVIPOWER: Energy and resource efficient neighbourhood revitalisation in Polish cities

Project Lead: adelphi research gGmbh,
Countries: Germany, Poland
Project duration: 09/17 - 03/19
Funding: 127,491 €
Programme: European Climate Initiative (EUKI)

Project objectives:
The overall goal of the project is to unleash the transformative potential of the renewal efforts that will be developed under the National Revitalization Law and as well as local revitalisation plans by making them more sustainable, especially in regard to resource efficiency.

Project summary:
The aim of the project is to develop strategies to spread roof and façade greening in eight Polish cities. Thereby, they build on the experience of Hamburg as a German model city, which has not only used roof greening to reduce CO2 but also to improve the climate of the city.

Within the project framework adelphi and the partner organisations IPA, PNEC and IWO e.V. introduced sustainable development and energy efficiency at the heart of the debate on revitalization in Poland by designing and conducting innovative modular and "open source" training concept REVIPOWER for and together with Polish municipal authorities and key actors from local and regional organizations. The training modules were developed in together by experts from Germany and Poland, the participants from municipalities and local and regional actors. A more participative approach was used instead of the traditional separation between teachers and trainees. The thematic modules are structured by taking into account the socio-economic priorities of the Polish participating municipalities. The goal was to overcome the usual sectoral approach and to tap into the potential of cross-cutting approaches for the revitalisation efforts.

Within the framework of the project REVIPOWER – energy and resource efficient neighbourhood revitalization in Polish cities, the working group of experts proposed the resource- and energy-efficient urban development and re-development paradigm covering

key areas of interventions: i) **efficient land use / sustainable urbanism; ii) efficient mobility; iii) efficient buildings and districts.**

All training materials are available as an open-source data and can be uploaded from the project website along with the training guidebook:
https://efficient-city.org/pl/materialy-szkoleniowe-revipower
login: revipower
Password: efficientcity

More information:
https://efficient-city.org/

Peer-to-peer capacity building, dissemination, multiplication

10. Project: Bridging European and Local Climate Action (BEACON)

Project Lead: adelphi research, Ecofys
Project Partners: Association of Municipalities Polish Network "Energie Cités" (PNEC), Centre for Renewable Energy Sources and Saving (CRES), Ecofys, Energy Cities, Environ Association, Faculdade de Ciências da Universidade de Lisboa (FCiências.ID), National Trust EcoFund (NTEF), OER (Energy Cities Romania), SEVEn, UfU - Independent Institute fore Environmental Issues
Donor: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)

Project summary:
The European Union (EU) has set itself ambitious climate and energy policy goals within the framework of the Paris Agreement. In many European countries, however, ambitious climate protection measures often face scepticism or even rejection. The reason for this is often a lack of understanding of the potential of climate action, or investment power that has been weakened by the financial and economic crisis. Although there are progressive actors who implement climate policy measures and recognise their potential, the number, scope and visibility of these projects must be significantly increased to enable a sustainable transformation from the local to the national level.

Project objectives:

Promoting climate policy, strengthening European integration

The project "Bridging European and Local Climate Action (BEACON)" is part of the European Climate Initiative (EUKI), which was launched by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). It aims to increase the acceptance and impact of climate policy projects in Central, Eastern and Southern Europe and to initiate further climate mitigation measures. How can energy costs be cut down on? How does sustainable mobility improve the quality of life in cities? What does climate policy have to do with a future-oriented investment policy? By promoting transnational dialogue on issues such as these, the project acts as a BEACON for municipalities across Europe by making the benefits of climate policy measures – and thus also of EU climate policy – more tangible. The focus of the project is on cooperation and the exchange of good practices among municipalities, national decision-makers, and educational institutions with the aim of

reducing political, technical and social barriers at local and national level. Last but not least, cross-border cooperation should strengthen cohesion within the EU.

More information:
https://www.adelphi.de/en/project/bridging-european-and-local-climate-action-beacon

Climate mitigation and adaptation in an urban context

SOLMACC - Strategies for Organic- and Low-input-farming to Mitigate and Adapt to Climate Change,

Project Lead: International Federation of Organic Agriculture Movements Regional EU Group
Project Partners: Associazione Italiana per l'Agricoltura Biologica, Italy Bioland Beratung GmbH, Germany Ekologiska Lantbrukarna/Swedish Ecological Farmers Association, Sweden Forschungsinstitut fur biologischen Landbau Deutschland e.V., Germany
Duration: 2013-2018
Total Budget: 2,140,121.00 €
EU contribution: 1,070,060.00 €
Programme: LIFE12 ENV/SE/000800)

Project objectives:

The SOLMACC aimed to demonstrate a set of innovative, climate-friendly farm practices under experimental conditions. These practices were to demonstrate benefits for climate change mitigation and adaptation, and coherence with other sustainability objectives. The project thus hoped to promote the wide adoption of more environmentally friendly farming practices and inform the ongoing development of policy and debate around climate change and agriculture.

The project demonstrated a set of four, innovative, climate-friendly farming practices:

1. Optimised on-farm nutrient recycling;
2. Optimised crop rotation with legume-grass leys;
3. Optimised tillage system; and
4. Agroforestry. These will be implemented on 12 organic farms in Sweden, Germany and Italy.

The project expected to show a reduction of around 15% in the carbon footprint of plant products and greater resilience to the consequences of climate change on the pilot farms. It also expected to show coherence with other sustainability objectives of the European Union, such as the control of soil erosion, biodiversity conservation and enhancement, and the efficient management of natural resources, such as water.

By successfully demonstrating the technical and economic viability of the interventions, the project contributed to the mainstreaming of these, as yet, uncommon agricultural practices and, in turn, to the achievement of European environmental objectives. **Expected Results** The successful implementation of an innovative set of climate-friendly farm practices on twelve organic farms in Sweden, Germany and Italy will deliver: i) a 15% reduction in GHG emissions from agricultural activities; ii) an improved capacity to adapt to the negative effects of climate change; iii) a richer debate on EU policy around climate change and agriculture.
More information: *http://solmacc.eu/end-of-the-solmacc-project-final-newsletter/*

EUROPEAN CLEAN AIR CENTRE

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