ENERGISE

EUROPEAN NETWORK FOR RESEARCH, GOOD PRACTICE AND INNOVATION FOR SUSTAINABLE ENERGY

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POLAND

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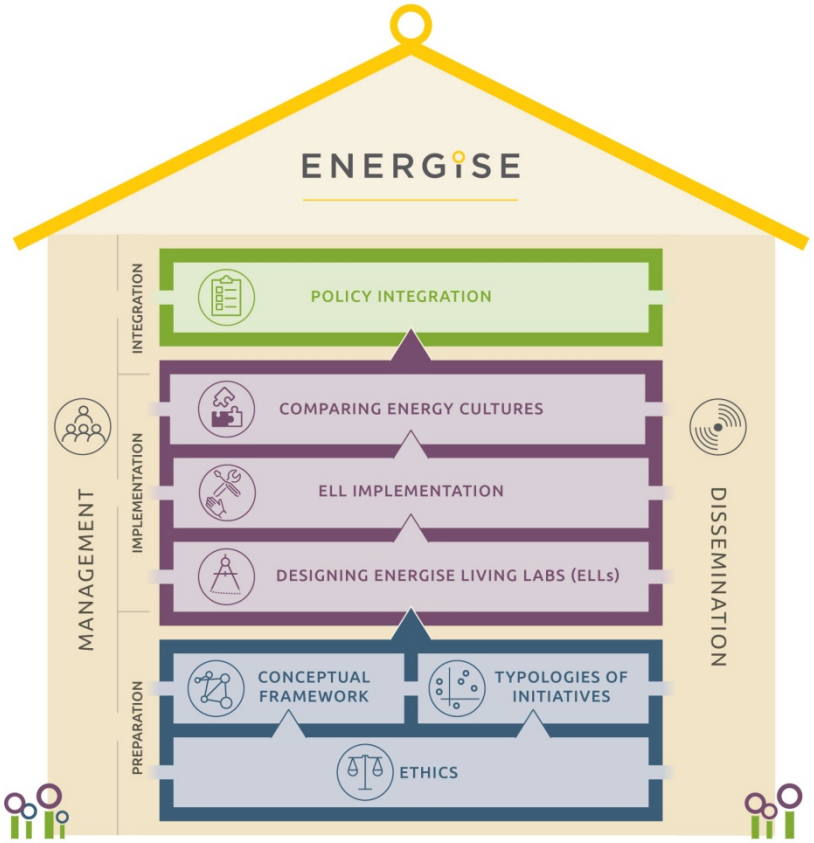
ENERGISE PROJECT

ENERGISE is an innovative pan-European research initiative to achieve a greater scientific understanding of the social and cultural influences on energy consumption. Funded under the EU Horizon 2020 programme for three years (2016-2019), ENERGISE develops, tests and assesses options for a bottom-up transformation of energy use in households and communities across Europe. ENERGISE's primary objectives are to:

- **Develop an innovative framework** to evaluate energy initiatives, taking into account existing social practices and cultures that affect energy consumption.
- **Assess and compare the impact** of European energy consumption reduction initiatives.
- **Advance the use of Living Lab approaches** for researching and transforming energy-related practice cultures.
- **Produce new research-led insights** into the role of household routines and changes to those routines towards more sustainable energy.
- **Encourage positive interaction** between actors from society, the policy arena and industry.
- **Effectively transfer** project outputs towards the implementation of the European Energy Union.



INTRODUCTION

This document is one of 30 national briefs, demonstrating key aspects of national energy supply and demand dynamics. Each brief is comprised of five sections:

Section 1 summarises the energy profile of the country. The section provides basic quantitative information of demand demographics and usage profiles, market trends and energy supply profiles, as well as qualitative reflections on current national energy policy. ***For all the briefs, the quantitative information is derived from ec.europa.eu/eurostat (2015 data), eea.europe.eu (2015 data), and climate-zone.com, unless otherwise stated.***[1] The qualitative reflections are based on a literature reviews and desk-research. References for the literature review and the desk-research are provided in footnotes or in section five.

Section 2 summarises the nationally based sustainable energy consumption initiatives (SECIs) that have been identified as part of ENERGISE WP2 framework (Jensen, 2017). Each SECI has been coded according to the Problem Framing Typology developed in ENERGISE WP2 (Jensen et al, 2017b).

Section 3 provides a *good practice* example of a national SECI that corresponds to category 3: “Changes in Everyday Life” or 4: “Changes in Complex Interactions” in the Problem Framing Typology. Please refer to Jensen (2017) and Jensen et al (2017b) for more information on the way the data for the good practice SECIs has been researched and documented.

Section 4 provides a brief summary of major nationally specific trends and their implication for energy consumption policies.

Section 5 provides an overview of sources used for qualitative assessments, and can be used as inspiration for further reading.

The national briefs provide contextual socio-material information for the further work to be carried out in Work Package 4, Work Package 5 and Work Package 6 in ENERGISE.

1.1 WP2: TYPOLOGIES OF ENERGY INITIATIVES

ENERGISE WP2 is a systematic criteria-guided review and classification of existing sustainable energy consumption initiatives from 30 European countries (EU-28, Switzerland, and Norway), which provides a comprehensive European database of energy initiatives involving households, and related typologies of sustainable energy consumption initiatives. This extensive synthesizing work guides the selection of Living Lab design elements for ENERGISE and future energy consumption research, policy and practice.

[1] Some piecharts will be empty, as no information is available.

This is done in order to

- Construct innovative typologies of sustainable energy consumption initiatives that can inform further research and action.
- Identify key success factors and related indicators, focusing on individual-level, collective, organizational, institutional and societal aspects of energy consumption, which will inform subsequent WP 3 (Designing Living Labs), WP 4 (ENERGISE Living Labs) and WP 5 (Capturing Energy Cultures).
- Progress the goals of the European Energy Union by creating a publicly archived open access dataset of sustainable energy initiatives across 30 countries in Europe.

Suggested further reading:

Jensen (2017) *Identification of key success factors and related indicators.* ENERGISE – European Network for Research, Good Practice and Innovation for Sustainable Energy, Grant Agreement No. 727642, Deliverable 2.2.

Jensen et al. (2017a) *Establishment of a comprehensive open access dataset of sustainable energy consumption programmes and Interventions.* ENERGISE – European Network for Research, Good Practice and Innovation for Sustainable Energy, Grant Agreement No. 727642, Deliverable 2.3.

Jensen et al. (2017b) *Constructions of typologies of sustainable energy consumption initiatives (SECIs).* ENERGISE – European Network for Research, Good Practice and Innovation for Sustainable Energy, Grant Agreement No. 727642, Deliverable 2.4.

Sources of quantitative statistics (unless otherwise stated):

Climate data:
http://www.climate-zone.com/continent/europe/

Demography data:
http://ec.europa.eu/eurostat/statistics-explained/index.php/Population_structure_and_ageing

http://ec.europa.eu/eurostat/statistics-explained/index.php/Educational_attainment_statistics

Dwelling type data:
http://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Distribution_of_population_by_dwelling_type,_2015_(%25_of_population)_YB17.png

Energy demand and supply quantitative data:
http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_consumption_in_households

Final energy consumption of households per capita data: https://www.eea.europa.eu/airs/2017/resource-efficiency-and-low-carbon-economy/household-energy-consumption

MWh conversion data:
https://www.unitjuggler.com/convert-energy-from-toe-to-MWh.html?val=893.9

POLAND

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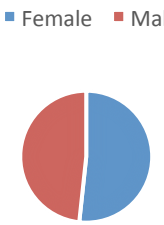
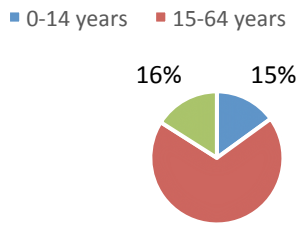
DEMOGRAPHY, ENERGY CONSUMPTION AND ENERGY SUPPLY

GENDER PROFILE

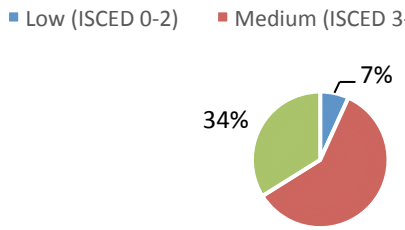


AGE PROFILE (2016)

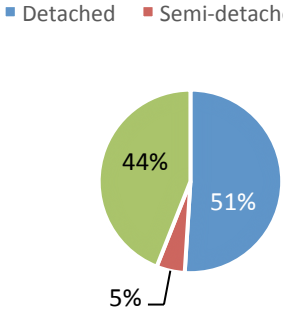


CLIMATE: temperate with cold, cloudy, moderately severe winters with frequent precipitation; mild summers with frequent showers and thundershowers

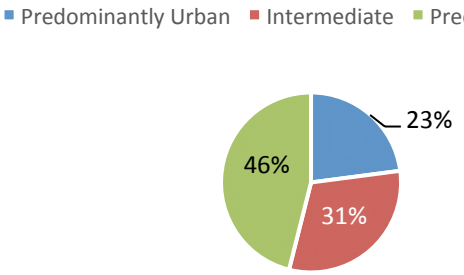
EDUCATIONAL PROFILE (25-54 Y, 2016)



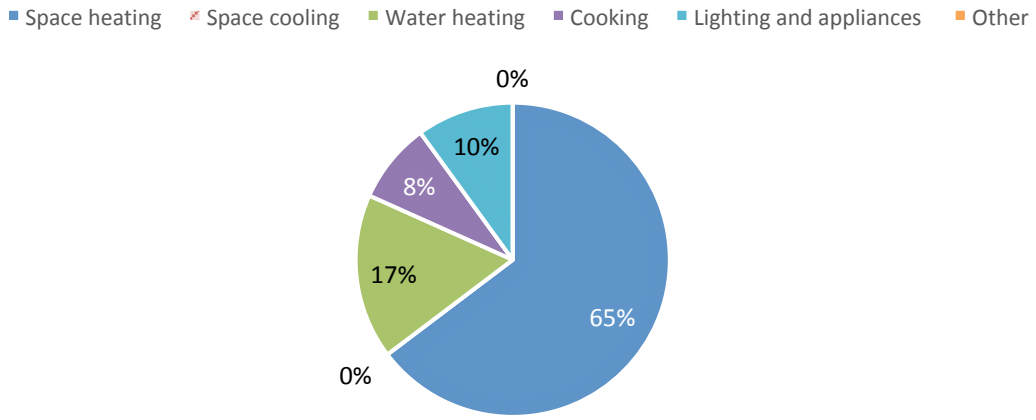
COMMON DWELLING TYPES (2015)



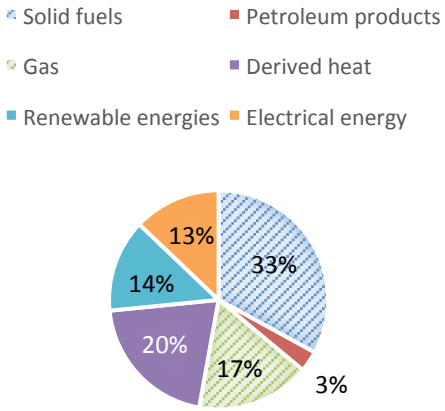
URBAN - RURAL DISTRIBUTION (OECD)



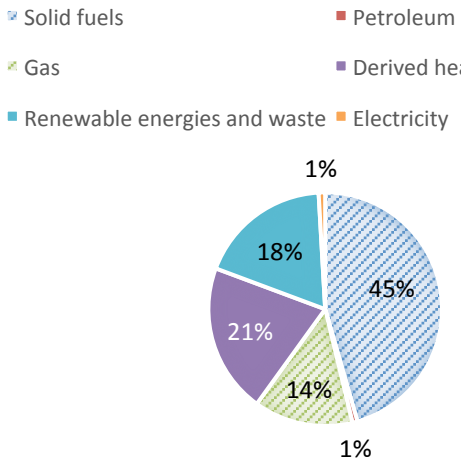
RESIDENTIAL FINAL ENERGY CONSUMPTION BY TYPE OF END-USE (2015)



SHARE OF FUELS IN THE FINAL ENERGY CONSUMPTION IN THE RESIDENTIAL SECTOR (2015)



SHARE OF FUELS IN FINAL ENERGY CONSUMPTION - RESIDENTIAL SPACE HEATING (2015)



FINAL ENERGY CONSUMPTION FOR HOUSEHOLDS, PR CAPITA (2015)

5.768 MWh

ENERGY SYSTEM AND ENERGY POLICY TRENDS

Energy system

What characterises the Polish energy sector is that Poland is the largest producer and consumer of coal in the EU, it has the largest central heating subsector in the EU and is the country of oil and gas transit between Russian Federation and Germany. Poland has neither nuclear power, nor substantial resources of hydro energy.[2]

Coal accounts for 83.7% of gross electricity generation. In 2015, coal-based plants share in electricity generation reached 50.6% and lignite's share amounted to 22.1%. Onshore wind and other renewable energy sources (other than hydropower plants) produced only 6.3%. When biomass co-firing is added, RES share in generated electricity reaches 12% in total. Another 2.6% of electricity generation comes from gas-fired power plants.[3]

According to data of the Energy Regulatory Office, six largest companies in the energy sector in Poland are: i) Grupa Kapitałowa (GK) PGE (in 2011 produced 40% of the domestic electricity); ii) GK Tauron (in 2011 produced 14% of the domestic electricity); iii) GK Enea (in 2011 produced 8% of domestic electricity); iv) EDF; v) ZE PAK; vi) GK Energa.

Gas supply in Poland is covered by domestic deposits as well as by imports. Gas is mainly imported from Germany and the Czech Republic, and also from Russia. Poland is among the EU countries that are least dependent on imported gas. The biggest producer and importer of gas is the Grupa Kapitałowa Polskie Górnictwo Naftowe i Gazownictwo (PGNiG). The main gas production deposits in Poland are located mainly in southern and western Poland (the Podkarpacie region and the western Wielkopolska region).[4]

Particular socio-material aspects that influence energy consumption

In 2015 the share of household energy consumption in total energy consumption in Poland accounted for 31%. The major energy source for energy consumption in households are coal and other solid fuels (33%), derived heat (21%), natural gas (17%), renewables (14%), electricity (13%) and liquid fuels (3%).

In terms of end-use, by far the largest share of energy consumed by households is used for heating, although this share has been falling – from 73.1% in 1993 to 65.5% in 2015. The main reason behind this decrease is claimed to be the installation of more efficient gas and electric heating appliances, as well as the thermal modernization of buildings and stricter building standards. Next in the list are water heating (16.2% of households' energy consumption) and cooking (8.5%). Lighting and electrical equipment are united in one category and account for 9.8% of energy consumption (almost two times higher than the percentage in 1993). The higher

[2] World Energy Council (2014). *Energy Sector of the World and Poland. Beginning, Development, Present State*. Available at: https://www.worldenergy.org/wp-content/uploads/2014/12/Energy_Sector_of_the_world_and_Poland_EN.pdf
[3] Schnell, Ch. and Olszewski, A. (2017). *The German Energy Transition and the Polish Energy System. Part II: The Polish Energy System*. Available at: https://www.ecofys.com/files/files/ecofys-2017-the-german-energy-transition-and-the-polish-energy-system.pdf
[4] Polish Information and Foreign Investment Agency (2011). *Energy Sector in Poland*. Available at: https://www.paih.gov.pl/files/?id_plik=19610

penetration of electrical equipment and changes in the intensity of use of equipment (washing machines, dishwashers, TV, computers) are assumed to be the cause for almost double increase.[5]

Poland is among the biggest users of district heating systems in Europe and is the second producer of district heat in the EU after Germany. Polish district heating systems are mainly coal-fired. It is claimed that Polish district heating systems could contribute to improving energy efficiency and decrease air pollution from power and heat sources. More than 60% of heat producers are small companies that generate heat in (coal) boiler houses, without cogeneration. The fuel mix for heat generation in the country is as follows: 75% coal; 8% gas; almost 8% RES; and 4% oil.[6]

In the first half of 2017, the electricity prices for households in Poland were among the lowest in the EU – 14.57 euro cents per kWh. In comparison, the average price for the EU-28 for the same period was 20.41 euro cents per kWh.[7]

Current Trends in Energy Policy

Energy efficiency policy in Poland is defined by two main documents: i) Poland's Energy Policy until 2030; ii) and National Energy Efficiency Action Plans (drawn in 2007, 2012, 2014, and 2017 and required by Directive 2006/32/WE and 2012/27/EU). The energy efficiency targets for 2020 pursuant to Directive 2012/27/EU are reduction of primary energy consumption and final energy consumption by 9% compared to the 2001-2005 period baseline. About one quarter of these savings are to be achieved in the household sector.[8]

In order to ensure energy efficiency in residential buildings, the government introduced measures that provide support for thermal modernisation and renovation of buildings. An example is the Thermal Modernisation and Renovation Fund (financed from the state budget) that is a support programme implemented since 2009. The aim of the programme is to provide financial assistance in order to improve the technical condition of the existing housing stock and to reduce its heat demand.[9]

After joining the EU in 2004, Poland experienced a rapid growth of RES. The share of RES in final energy consumption reached 12.4% in 2015. The fastest growing technology with a significant increase in the last decade was the onshore wind energy, but currently onshore wind and co-firing still account for almost 90% of RES in Poland.[10]

In the last few years, smart grid has also been developed. In 2016, four leading Polish distribution system operators (Tauron Dystrybucja, RWE Stoen Operator, Enea Operator and PGE Dystrybucja) joined forces to modernise their power grid. In 2016, a supply of 36,000 S650 Smart Grid Terminals for the medium- and low-voltage network was supplied through a major contract between Landis+Gyr (an industry leader in energy management solutions) and the four DSOs

[5] Peryt, S. and Gilewski, P. (2017). *Energy Efficiency in Poland in Years 2005-2015*. Available at: https://stat.gov.pl/files/gfx/portalinformacyjny/en/defaultaktualnosci/3304/5/13/1/energy_efficiency_in_poland_in_years_2005-2015.pdf
[6] Wojdyga, K. and Chorzelski, M. (2017). 'Chances for Polish district heating systems.' *Energy Procedia* 116, 106-118. Available at: https://ac.els-cdn.com/S187661021732266X/1-s2.0-S187661021732266X-main.pdf?_tid=559f774c-cf8a-4ef8-904c-8dad277990af&acdnat=1523621828_d8a20a8c1bbc3c14c22e9e602d9f1008
[7] Statista (2018). *Electricity Prices for Households in Poland from 2010 to 2017*. Available at: https://www.statista.com/statistics/418110/electricity-prices-for-households-in-poland/
[8] Peryt, S. and Gilewski, P. (2017). *Energy Efficiency in Poland in Years 2005-2015*.
[9] Peryt, S. and Gilewski, P. (2017). *Energy Efficiency in Poland in Years 2005-2015*.
[10] Schnell, Ch. and Olszewski, A. (2017). *The German Energy Transition and the Polish Energy System*.

mentioned above. The Polish DSOs will need to upgrade 250,000 transformer stations with smart grid equipment.[11]

The roll-out of smart meters in Poland is expected to bring a range of positive effects including demand reduction, peak load moderation and cost savings from metering. The introduction of smart meters would result in the emergence of a new market that provides specific value added services and the ability to further use the functions of smart metering.[12]

Trends in national campaigns

Informational and educational campaigns as well as programmes related to energy saving behaviour, introduction of renewable energy sources and increasing energy efficiency of building stock have been implemented in Poland. An example is the Priority Programme of the National Fund for Environmental Protection and Water Management (NFOŚiGW) which finances educational and promotional actions, implementation of intelligent measurement and information networks and of distributed renewable energy sources, energy storage, etc.

With regard to national energy educational and informational campaigns, such have been organised by the Ministry of Economy in Poland since 2012. The aim of the campaigns is to promote public behaviour contributing to energy savings among end users and domestic households and to increase social awareness on energy efficiency issues and other issues concerning energy use. Educational handbooks and guidebooks related to the topic of energy savings have been published as part of the campaign and disseminated to the public through the Ministry website.[13]

OVERVIEW OF NATIONAL SECIS

Below please find a list of Polish SECIs that have been researched and documented through WP2 of ENERGISE. The SECIs are researched, selected and documented based on a set of requirements and research interests (please see Jensen 2017 for details). The list should not be regarded as exhaustive or representative of all kinds of energy initiatives carried out in the country.

USmartConsumer: Joining Utilities & Consumers	 Changes in Individuals' Behaviour
FINSH: Financial and Support Instruments for Fuel Poverty in Social Housing in Europe	 Changes in Individuals' Behaviour
EEPLIANT: Energy Efficiency Compliant Products 2014	 Changes in Technology

[11] Landis+Gyr (2016). *Smart Grid Development in Poland*. Available at: http://eu.landisgyr.com/blog/smart-grid-development-in-poland
[12] RWE Polska (n.d.). *Technology Scenarios for the Polish Energy Market through 2050*. Available at: https://www.rwe.com/web/cms/mediablob/de/2560854/data/184336/4/rwe/innovation/Technology-scenarios-for-the-polish-energy-market-through-2050.pdf
[13] Central Statistical Office and The Polish National Energy Conservation Agency (2015). *Energy Efficiency Trends and Policies in Poland*. ODYSSEE – MURE 2015. Available at: http://www.odyssee-mure.eu/publications/national-reports/energy-efficiency-poland.pdf

STEP_BY_STEP: Step by Step Commitments for Energy Saving	Changes in Individuals' Behaviour
iBROAD: Individual Building (Renovation) Roadmaps	Changes in Technology
2gether4vulnerability	Changes in Complex Interactions
MOBISTYLE: MOtivating end-users Behavioral change by combined ICT based tools and modular Information services on energy use, indoor environment, health and lifestyle	Changes in Complex Interactions
Assessing the intangibles: The socioeconomic benefits of improving energy efficiency (IN-BEE)	Changes in Individuals' Behaviour
START2ACT	Changes in Everyday Life Situations
TOPTEN ACT: Enabling consumer action towards top energy-efficient products	Changes in Individuals' Behaviour
EL-EFF REGION: Boosting efficiency in electricity use in 8 European regions	Changes in Individuals' Behaviour
EYEMAN CHAMPIONSHIP: European Young Energy Manager Championship	Changes in Individuals' Behaviour
ESMA: European Smart Metering Alliance	Changes in Technology
COMEON LABELS: Common appliance policy – All for one, One for all – Energy Labels	Changes in Individuals' Behaviour
ENESCOM: European Network of Information Centres promoting Energy Sustainability and CO2 reduction among local COMmunities	Changes in Individuals' Behaviour
ESD II: European Solar Days II	Changes in Technology
MOBILE2020: More biking in small and medium sized towns of Central and Eastern Europe by 2020	Changes in Everyday Life Situations

ICOSAW Promotion of the Intelligent Combination of Sun and Wood for Producing Warm Water and Heating for Private Houses	Changes in Technology
PROMOTION 3E: Promotion of energy efficient appliances	Changes in Individuals' Behaviour
SAVE@Work4Homes: Supporting European Housing Tenants in Optimising Resource Consumption	Changes in Individuals' Behaviour
Local energy production in Kisielice	Changes in Complex Interactions
EPORE: Energy Poverty Reduction in Eastern Europe	Changes in Individuals' Behaviour
Support for thermal refurbishment and renovations	Changes in Technology
Energy Saving in Schools - EURONET 50/50	Changes in Individuals' Behaviour
Installation of renewable energy systems in the public and residential buildings	Changes in Technology
Removal of the low-stack emission in Miechow – the KAWKA project	Changes in Technology
Promotional packs on energy efficiency in the Lesser Poland Voivodship	Changes in Individuals' Behaviour
Implementation of air quality plan for Małopolska Region - Małopolska in a healthy atmosphere	Changes in Individuals' Behaviour
KIDS4FUTURE: Creating Actions among Energy Conscious Children	Changes in Individuals' Behaviour
ACTIVE LEARNING: Integration of Active Learning and Energy Monitoring with School Curriculum	Changes in Individuals' Behaviour
BIOENERGY FARM: Implementation plan for BioEnergy Farm - an experimental agricultural biogas plant in Studzionka	Changes in Technology

‘GOOD PRACTICE’ EXAMPLE OF POLISH SECI

Local energy production in Kisielice

Brief Description

Kisielice is an example of electricity self-sufficient town. Since September 2014, 100% of the electricity used in the town has been produced from renewable sources such as wind energy installations and biomass boiler that is fed with straw provided by local farmers. In addition, 85% of winter heating comes from the local biomass combined heat and power (CHP) plant. In recognition of its achievement, the town has been awarded a European Commission ManagEnergy Award 2014 in the self-sufficiency category.

Brief Contextualization

The case of Kisielice is quite a remarkable one. In Poland, 90% of electricity is produced by coal-fired thermal power stations. In sharp contrast to the rest of the country, the little town of Kisielice in northern Poland is an extraordinary example of local energy transformation, proving that alternative ways are possible. In September 2014, the town and its 2200 citizens became energy self-sufficient, producing all electricity and most of the heating energy locally and from renewable sources. The idea to be self-sufficient for electricity with local renewable sources was implemented after a two year period of intensive and productive community debates and planning.

Aims and objectives

The aim of the project was to demonstrate to the citizens the positive effects of greener energy sources and to encourage foreign investors to fund the construction of wind farms in sparsely populated rural areas. The energy self-sufficiency project of Kisielice town had the following objectives: to increase the town’s energy independence, abandon coal-based energy production, utilise the local biomass and biofuel capacity, and reduce CO_2 emissions. The overarching aim was to make Kisielice the leader in the use of renewable energy sources in Poland.

Methods for intervention

This project was initiated by the town’s mayor, who wanted to copy in Kisielice some of the best energy efficiency and RES practices from different western European countries. Due to initial resistance of the town’s population, the municipal authorities organised numerous awareness-raising events and open-door discussions to convince the people about the benefits of the project. The campaign was very successful and the majority of residents embraced the idea. Most opposition came from farmers, who had to provide land on which to raise the wind turbines, but after realising that they would directly benefit from the project, farmers also gave the initiative a green light.

Steps of implementation

- Involvement of and discussions with the town residents

- Construction of two wind farms which together consist of 50 wind turbines with a total capacity of 94.5MW.
- Construction of a 6MW biomass CHP plant generating electricity and heat energy by burning cereal straws which are purchased from the local farmers.
- Construction of a third 24MW wind farm.
- Planning of further RES projects: heat pumps, solar panels, small wind turbines.

Results/outcomes

The town became energy independent. At the same time, as the town no longer relies on coal to provide for its energy, GHG emissions were reduced and air quality improved. Local farmers benefit also financially, as those who have wind farms on their land are paid around 5,000 EUR per year for each turbine. Their agricultural surplus like straw that would otherwise go to waste is also purchased and used as biofuel in the combined power-heat plant.

The role of the households

Over the course of two years, citizens/households participated in numerous meetings and discussions organised by the municipal authorities. Citizens were initially rather sceptical and did not support the idea, but in time, the opinion of town's residents turned around and they embraced the project, after they were informed about the economic and environmental benefits, including cheap thermal energy, reduced air pollution and the use of agricultural surpluses as fuel for the CHP plant. Local farmers get an extra income of about 5,000 EUR per year for the lease of each wind turbine within their land. They also provide cereal straw to be used as biofuel, which represents an additional source of income for them. Households interested in micro renewable energy sources projects such as heat pumps, solar panels, small wind turbines and similar can join local associations and apply for municipal micro-grants and loans.

Location

Town of Kisielice is located in northern Poland. It has 2200-2300 inhabitants and covers 17,280 hectares. Most of the land is farmland and the majority of population lives of farming and agriculture.

Was/is the initiative successful?

Kisielice is one of the first places in Poland where wind farms, biomass boiler plants and biogas plants were built, making the small town completely energy independent. 100% of the electricity and 85% of winter heating energy is produced from renewable sources. The European Commission recognised the town's remarkable renewable energy project in 2014, when Kisielice received the ManagEnergy Award, as an outstanding example of sustainable energy action at the local level.

Textual and communicative aspects of initiative

Due to the fact that most energy / electricity in Poland comes from burning coal, energy consumption was above all framed as a problem of pollution and poor air quality.

Producing electricity and heating energy from local renewable sources was framed also in terms of monetary benefits for the town's population, especially the farmers. This was very important, since most people in the rural areas tend to be very conservative and do not easily accept changes and novelties in their lives.

The entire project had a very strong community aspect, and town's residents were explained that the initiative would not be successful unless it is actively supported by the majority of people (contributing land for wind turbines, providing biofuel for the power plant). A switch to RES and energy self-sufficiency was therefore possible only as a result of social organisation and not as a sum of individual actions.

The physical/technological aspects of the initiative

The town is surrounded by large and flat agricultural areas, which are very suitable for wind energy installations. With the help of foreign investors, two wind farms were built in 2014, which together consist of more than 50 turbines of a total capacity 94.5 MW. The local combined heat and power (CHP) plant with a 6 megawatt biomass boiler contributes 85% of the needed heat energy into the town's district heating network. The plant generates electricity by burning cereal straws, which are purchased from local farmers. The district-heating network provides heating to 250 buildings – in other words, it serves more than 90% of the households in Kisielice. In summer, waste heat from the plant supplies hot water to the town.

Another smaller biogas power plant started operating in 2014, producing additional 1 MW of heat and 1 MW of electricity. The plant is fuelled by silage corn, which is also bought from the local farmers.

An additional 24 MW wind farm is under construction. Kisielice intends to purchase and install the first solar photovoltaic plant in northern Poland. The municipality is also planning to finance local micro solutions such as small wind turbines, roof solar panels and heat pumps for local households.

Shared understandings related to initiative

Initiators and householders had a shared understanding of the initiative, seeing it as having diverse and numerous positive effects. These included financial benefits, cleaner air and less pollution, and a strong sense of pride and satisfaction for being a part of the project that is unique for Poland. Initially, the perceptions about the initiative were quite different, but a shared understanding was achieved through a long process of awareness events and public discussions.

CONCLUDING REMARKS AND POLICY IMPLICATIONS

Polish energy policy is clearly set on achieving the planned reductions in primary and final energy consumption. About 25% of the envisaged reductions should occur in the household sector, mainly through technical measures such as thermal insulation and renovation of multi-apartment residential buildings, the majority of which date back to the socialist period. Several SECIs reviewed in the frame of the ENERGISE project resonate with this objective – for example 'Support for thermal refurbishment and renovations' which provides partial (20%) funding for thermal renovation of buildings.

As Poland is overwhelmingly dependent on coal to meet its energy needs, the air pollution is a major problem in the country. Not surprisingly, quite a few initiatives have the goal of improving the air quality by replacing the old and inefficient heating sources using coal with cleaner and more energy-efficient energy systems ('Installation of renewable energy systems in the public and residential buildings,' 'Removal of the low-stack emission in Miechow,' 'Promotional packs on energy efficiency in the Lesser Poland Voivodship,' 'Implementation of air quality plan for Małopolska Region'). This would have a combined effect of increased energy efficiency, reduced greenhouse gas emissions and decreased use of hazardous combustion products.

The majority of analysed initiatives (17 out of 31) were classified as initiatives targeting a change in behaviour of individuals. They include information and awareness raising campaigns, promotion of best practices, tailored energy tips and similar. Quite a few of them are specifically addressing vulnerable consumers, as energy poverty is an important issue in Poland. In their case, the energy use aspect which most often receives particular attention is heating, since the low income households are most likely to use low-efficient and highly polluting fuel for heating their homes. Some awareness and educational campaigns promote introduction of renewable energy sources as means for increasing energy efficiency.

A very good example which tackled several aspects of Polish energy-related problems is the case of Kisielice – a town which manages to satisfy all its electricity needs through local energy production. The project included an effective awareness-raising campaign, which convinced sceptical citizens to embrace the idea of abandoning coal-based energy production in favour of electricity and heat produced by wind turbines, solar panels and biomass CHP plans. After the successful construction of the energy-producing capacities, Kisielice became 100% energy independent, the air quality improved, and some of the local residents, who provided land for wind turbines or who supply agricultural surplus used for fuel in the CHP plant receive regular income.

Kisielice case shows that by engaging a large number of relevant stakeholders and a bold vision that attracts new actors like local residents (households and farmers) to enter the energy market, tangible results can be achieved in relatively short period of time. Kisielice won the European Commission's ManagEnergy Award in 2014. It was praised not just for its technological achievements, but especially for the wide support that the project received from the local community, making it an inspiring example for what local residents

can achieve when they work across a community. Kisielice can be an excellent model not just for other towns in Poland, but across entire Europe as well, because the local authorities and communities are uniquely positioned to contribute to a clean energy future for all.

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