ENERGISE

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

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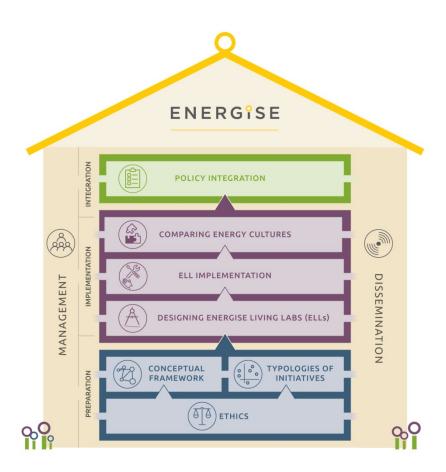
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ENERGISE PROJECT

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) YB 17.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



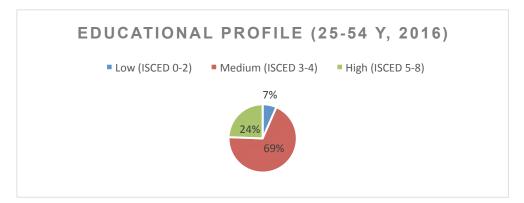
SLOVAKIA

Author: Lidija Živčič

DEMOGRAPHY, ENERGY CONSUMPTION AND ENERGY SUPPLY

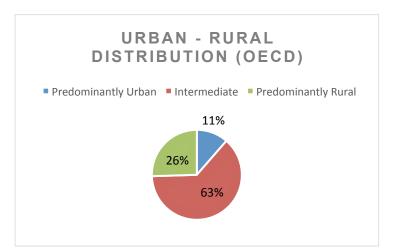


CLIMATE: temperate; cool summers; cold, cloudy, humid winters

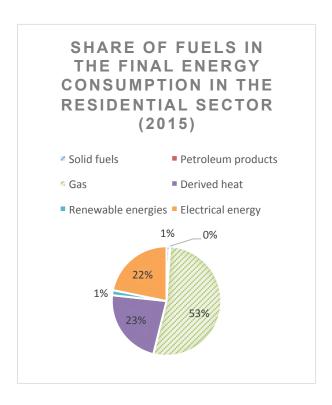


COMMON DWELLING
TYPES (2015)

Detached Semi-detached Flat







FINAL ENERGY CONSUMPTION FOR HOUSEHOLDS, PR CAPITA (2015)

4.262 MWh



ENERGY SYSTEM AND ENERGY POLICY TRENDS

Energy system

Slovakia has a balanced share of nuclear fuel and fossil fuels in terms of gross inland energy consumption. The shares of the individual energy sources in gross inland energy consumption in 2012 were as follows: natural gas 26%, nuclear fuel 24%, coal 21%, oil 20% and renewable energy sources, including hydropower, 9%.

The process of liberalising the gas and electricity markets led to the legal separation of generation/supply from transmission/distribution activities. Slovenské elektrárne a.s. was privatised in April 2006 with Enel, a.s. becoming the majority shareholder (66%). The question of covering the historical debts for the final phase of nuclear power plant operations - covering the costs of the decommissioning of nuclear power plants A1 and V1, processing and storing radioactive waste including decommissioning and storage of spent nuclear fuel and the final storage of spent nuclear fuel – remains open after privatisation.

Gas pipeline and distribution activities of Slovenský plynárenský priemysel, a.s. were legally separated with the creation of two subsidiaries: eustream, a.s. and SPP – distribúcia, a.s.

The legal separation of distribution from the supply or sales of electricity was accomplished in 2007 in distribution companies in the power industry with the creation of three regional distribution network operators (ZSE Distribúcia, a.s., SSE Distribúcia, a.s., Východoslovenská distribučná, a.s.) and three electricity providers. All consumers also became eligible consumers and gained the ability to select their own electricity and gas provider. The Slovak government decided within Resolution No. 656/2012 and on the basis of the new Energy Act that it would not apply a model of separate ownership for the transmission network operator within unbundling in the gas industry and as a result eustream, a.s. was not placed under separate ownership from SPP, a.s.; rather it remains a part of a vertically integrated company.

Source: http://www.economv.gov.sk/uploads/files/47NgRIPQ.pdf (accessed 11 April 2018)

https://www.iea.org/media/countries/Slovakia.pdf

Particular socio-material aspects that influence energy consumption

The structure of industry is one of the key aspects influencing energy consumption. Generally, the industry in Slovakia is not highly energy efficient, mainly due to highly energy intensive industries, such as aluminum production, iron and steel production and car industry. In spite of that, the energy consumption in Slovakia is below EU average. The per capita gross inland energy consumption in Slovakia in 2012 was 129 GJ per capita which is approximately 10% lower than the gross inland energy consumption in the EU 28 of 141 GJ per capita. The decrease in gross inland energy consumption is largely due to the restructuring of industry in the 1990s, the transition of investors over to sectors with higher added value and broader application of energy efficiency principles through the introduction of modern production technologies with lower energy intensity, insulating buildings, consumers transitioning to more energy saving appliances and savings resulting from the deregulation of prices. This development is the result of introducing less energy intensive technologies in industry and energy efficiency measures in households. Only the transport sector recorded an increase in final energy consumption over the past 10 years; decreases were recorded in all other sectors, including households. Final energy consumption of 69 GJ per capita in Slovakia is approximately 32% below the EU 27 average, which is 91 GJ per capita.

Final household energy consumption per capita in Slovakia, which was 17.2 GJ per capita in 2011



and 16 GJ per capita in 2012, is still below the European average of 23 GJ per capita. (2011). Future growth in electricity consumption must be considered given the expansion of air conditioning and electric vehicles. Energy efficiency measures, in particular insulating panel-construction apartment blocks and family homes, serve as a counterbalance to these increases. However, the improvements in insulation for buildings are usually concentrated to the better off parts of the population, while the less well-off parts of Slovak society are not able to invest into improving energy efficiency of their dwellings.

Sources:

http://www.economy.gov.sk/uploads/files/47NqRIPQ.pdf (accessed 11 April 2018)

Filcak, R. "National brief – Slovakia." Skype based communication, 10 April 2018.

Current Trends in Energy Policy

The latest trends in energy policy of Slovakia are captured in the 2014 'Energy Policy of the Slovak Republic'. In the field of energy efficiency, the following priorities are defined for increasing energy efficiency: achieve additional decreases in energy intensity at the level of the EU average; define a national target and securing financing for individual measures; fully transpose the Energy Efficiency Directive; establish a scheme for financing energy efficiency; secure high quality and thorough measurements, monitoring and evaluation in the area of energy efficiency; provide high quality energy efficiency information and education; introduce intelligent metering systems and creating intelligent networks to provide consumers with more information and the ability to make informed decisions; effective demand-side management. For increasing energy efficiency in the households, the following measures are highlighted: apartment building renovations and insulation, progressive shift in minimum requirements towards cost-optimum levels, replacement of high energy consuming appliances and products with new models, replacement of standard light bulbs with energy efficient fluorescent bulbs and LEDs, installation of individual temperature gauges and thermostatic valves, individual meters for all types of energy, voluntary energy audits.

Further contribution to decreased energy consumption in households is expected to come from the introduction of intelligent metering systems (IMS) and intelligent networks facilitating the remote calculation of energy consumption, regular meter reading for monitoring energy consumption over time and on higher IMS functionality also control over energy consumption. The constant overview of electricity, gas, heat and hot and cold water consumption, a greater quantity of information, simplified breakdowns and billing and new tariff products afforded by the introduction of IMS is expected to have a positive impact on the behaviour of consumers.

At the moment, one important debate is revolving around the access to grid. ENEL does not connect RES producers into the grid, which creates a barrier for faster penetration of RES. This obstacle is addressed by the association of RES businesses.

However, it is important to highlight that the major debates in Slovak energy policy still revolve around the mainstream energy sources; nuclear energy tends to be the center of debate.

Sources:

http://www.economy.gov.sk/uploads/files/47NgRIPQ.pdf (accessed 11 April 2018)

Filcak, R. "National brief – Slovakia." Skype based communication, 10 April 2018.



Trends in national campaigns

There are a couple of government organised campaigns, one on support for small renewable energy sources in households and the other on support of family houses insulation. Both programs offer subsidies to households. Apart from that, several renewables organisations and associations are implementing awareness raising and information activities on renewable sources of energy. The association of renewable energy businesses also advocate for enabling RES connection to grid. Several actors provide energy efficiency and energy saving tips for households, among which there are also various calculators available for households to calculate their energy use.

Slovak NGOs created a low-carbon platform, which is currently mainly focused on campaign against coal mining. Slovak Greenpeace runs an anti-nuclear campaign.

Sources: ENERGISE SECI Database

Filcak, R. "National brief – Slovakia." Skype based communication, 10 April 2018.

OVERVIEW OF NATIONAL SECIS

Below please find a list of Slovakian 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.

Zelená domácnostiam (Green Households program)	-	Changes in Technology
Program for support of family houses insulation	•	Changes in Technology
Energy literacy		Changes in Individuals' Behaviour
Energy savings in high schools	-	Changes in Technology
Repowermap	•	Changes in Individuals' Behaviour
Energy saving tips 1	•	Changes in Individuals' Behaviour
Energy saving tips 2	•	Changes in Individuals' Behaviour



Energy saving tips 3	Changes in Individuals' Behaviour
Accelerated Penetration of Small-Scale Biomass and Solar Technologies (ACCESS)	Changes in Technology
Creating liveable neighbourhoods while lowering transport energy consumption (PRO.MOTION)	Changes in Individuals' Behaviour
Energy, Education, Governance and Schools. A European school panel for involving local communities in energy efficiency programs (EGS)	Changes in Complex Interactions
European Network of Information Centres promoting Energy Sustainability and CO2 reduction among local COMmunities (ENESCOM)	Changes in Individuals' Behaviour
European Solar Days II (ESD II)	Changes in Technology
More biking in small and medium sized towns of Central and Eastern Europe by 2020 (MOBILE2020)	Changes in Everyday Life Situations
Promotion of the Intelligent Combination of Sun and Wood for Producing Warm Water and Heating for Private Houses (ICOSAW)	Changes in Technology
TRENDY TRAVEL; Emotions for sustainable transport (TRENDY TRAVEL)	Changes in Everyday Life Situations
Heating calculator	Changes in Individuals' Behaviour
Lighting calculator	Changes in Individuals' Behaviour
CO2 calculator	Changes in Individuals' Behaviour
Urban ET Festival in Bratislava. Slovakia: reconfiguring public space through social interactions	Changes in Complex Interactions
Action days and mobility packages for students of the University of Zilina. Slovakia	Changes in Individuals' Behaviour
Awareness campaign about public transport at the University of _ilina. Slovakia	Changes in Individuals' Behaviour



Creative Competition and Mobile Exhibition on Public Transport by children in _ilina. Slovakia		Changes in Everyday Life Situations
DEHEMS		Changes in Individuals' Behaviour
Electricity map	•	Changes in Individuals' Behaviour
START2ACT		Changes in Everyday Life Situations
From Estonia till Croatia: Intelligent Energy Saving Measures for Municipal housing in Central and Eastern European Countries (INTENSE)	•	Changes in Individuals' Behaviour
Creating Actions among Energy Conscious Children (KIDS4FUTURE)	•	Changes in Individuals' Behaviour
EPORE - Energy Poverty Reduction in Eastern Europe	•	Changes in Individuals' Behaviour



'GOOD PRACTICE' EXAMPLE OF SLOVKIAN SECI

Creative Competition and Mobile Exhibition on Public Transport by children in Žilina.



Description

The municipality of Žilina held a creative competition for primary school children, dedicated to the theme "My dream public transport". The children's art works were displayed in municipal premises as well as on public transport vehicles.

Contextualization

This activity was implemented within the framework of the BENEFIT project, as part of the Intelligent Energy Europe programme. Many changes and trends in society have had a marked influence on the supply and use of public transport in Žilina in recent decades. The opportunity for individual mobility afforded by the passenger car has challenged public transport. Despite the implementation of regulatory measures, it is expected that there will be an increase in individual vehicle transport use in city in the coming decades.

Aims and objectives

The objective of this activity was to improve the image of public transport by introducing an interesting and unusual promotional activity. The city wanted to use children's talent to convey the message that public transport is a safe and comfortable way of travelling in the city. Given children's and young people's reliance on public transport, it is essential to involve them in decisions concerning this important issue.

Methods for intervention

What is needed to discourage the use of cars and promote the use of public transport? Municipalities and public transport providers and operators should be committed to programmes that promote and develop public transport services. In bus or other public transport vehicle advertising, the vehicle is a medium commonly used by advertisers to reach the public with their message. This usually takes the form of promoting commercial brands, but it can also be used for public campaign messages, as was the case in this activity. The decorated trolleybus has certainly drawn a decent amount of attention from the public while travelling on the road. The purpose of the activity was also to increase public awareness, especially that of children, regarding environmental issues.

17 elementary schools participated in the competition and 289 artworks were entered. The activity was very successful. The relatively simple application and low costs mean there is huge potential for the replication of the activity in any city. Artworks were also used in the design of many promotional materials.

Steps of implementation

The activity started in September 2009 with the announcement of the competition at primary schools and its promotion via posters. The participants submitted their individual projects dedicated to the theme "My dream public transport". Art works were collected until January 2010. The jury evaluated the children's works in February. The best works were put on display in municipality premises as well as on public transport vehicles. All



participants of the competition were awarded with small gifts, with winners receiving valuable prizes. Winners in three age categories had the extraordinary opportunity to cover a real trolleybus with their paintings in September 2010, during the open day in the public transport operator yard. The decorated vehicle has been operating around the city to support a more positive attitude towards public transport. Personal and implementation costs were about €2,200. About 180 person hours were spent on this action.

The role of the households

Households were not directly involved, but the children could speak to there parents and feel involved in the project. It is also part of a long-term project trying to change the mentalities and Collective imagination, already in the childhood to build the future of the society.

Location

Žilina is the third largest city in Slovakia, the third most important industrial centre and the seat of a university, the Žilinská univerzita (founded in 1953). Since 1990 the historical centre of the city has been largely restored and the city has built trolleybus lines. Žilina is the main industrial hub of the upper Váh river basin region, with a fast-growing economy as north-west Slovakia's business centre with large retail and construction sectors. By far the biggest and most important employer is Korean car maker Kia Motors. By 2009, the plant produced 300,000 cars a year and had up to 3,000 employees. Kia Motors' direct investment in the Žilina car plant amounts to over 1.5 billion USD. It means the city has a special relation with the car industry, making it harder to promote alternatives to the use of cars.

Was/is the initiative successful?

The project seems to be successful since a lot of school and pupils participated, and the trolleybus company approved to join. Sensitising young people on transport issues has to be run on long-term, a one-off event is interesting but it should be repeated every year to make it efficient.

Textual and communicative aspects of initiative

The transportation by individual cars is presented as a factor of traffic jam and pollution. The initiative is targeting the children, as they are going to school everyday, it means the way they go is also an issue for the municipality. Decorating the trolleybus will led them to feel involved in the system and in municipality citizen life, und bring them to get used to good practices.

The physical/technological aspects of the initiative

The initiative is promoting less car use, and encouraging children to go to school by bus. The municipality has improved the public transport system and have now to bring citizens to use it. So physically everything is ready, and the initiative is just promoting the use of public transport. The task is difficult, because of the attachment to car use due to car industry that is bring a lot of jobs in the region.

Shared understandings related to initiative



The project is about mobility so it is clear that, energy is meant as gas for the cars. They are not trying to aware householders about pollution, but try to promote the alternatives, and encourage changes in mobility patterns.

CONCLUDING REMARKS AND POLICY IMPLICATIONS

The identified SECIs are a relatively good reflection of the current Slovak energy policy, especially when it comes to the field of energy efficiency. As the priorities of energy efficiency policy are focused on financing of energy efficiency, providing energy efficiency information and education or apartment building renovations and insulation, this is reflected in SECIs, mainly the ones that are promoted by the government.

The governmental programs Green Households and Program for support of family houses insulation are oriented towards energy efficiency and renewables and there are many SECIs focused on energy saving tips, energy literacy, CO2 or heating calculation. Apart from the general awareness raising through tips and calculators, there are several SECIs focused on raising awareness among children and students.

The struggle to get renewable sources of energy going in Slovakia is also reflected in SECIs as many focus on speeding up the penetration of various forms of renewables. Those are either government supported or motivated by RES businesses and initiatives.

The rising emissions from the transport sector are currently the least favorable trend in Slovak energy picture. Hence this sector is well covered by sustainable mobility SECIs, ranging from targeting individuals to involving towns and cities.

Majority of the identified SECIs are focused either on changes in individual's behavior (17) or on changes in technology (6). The more complex approaches, such as SECIs focused on everyday life situations and changes in complex interactions, are not so common.

Governmental programs are rather scarce, an important part of the action comes from EU projects and initiatives by the local NGOs. Actions are mostly not targeted to specific socio-demographic groups, the only exception being students, which appear as a target group in several SECIs.

The selected good practice example shows Creative Competition and Mobile Exhibition on Public Transport by children in Žilina. Key lessons learned from this example are that schools are aware of the problems, related to car based transport, and eager to take action. Working with children is beneficial also due to their impact on parents and wider families. Using children's creativity to show the benefits of public transport was a successful move of the SECI, as well as creating links between the public transport operator and schools. The later is important for policy-makers as it shows that creating links between two public actors that are very visible in the local community (school and public transport operator) can be a solid basis for forming promotion and awareness raising campaigns.

REFERENCES:

http://www.eltis.org/discover/case-studies/creative-competition-and-mobile-exhibition-public-transport-children-ilina#field_study_usr_contact_ref

