

# ENERGISE

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

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**Title:** European Network for Research, Good Practice and Innovation for Sustainable Energy  
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## COUNTRY REPORT:

### CZECH REPUBLIC

#### EXTRACTED FROM D2.5: PRODUCTION OF 30 NATIONAL SUMMARY BRIEFS

**Deliverable 2.5 description:** 30 national summary briefs of national energy supply and demand.

**Lead parties for deliverable:** AAU

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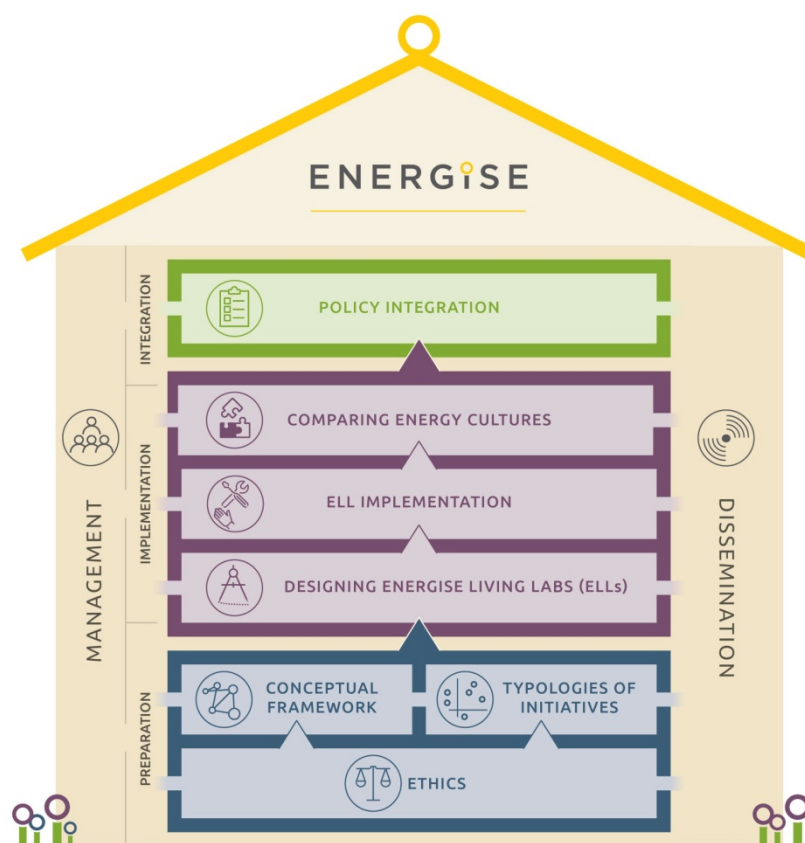
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## ENERGISE PROJECT

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.europa.eu (2015 data), and climate-zone.com, unless otherwise stated.***<sup>1</sup> 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 (SECI) 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.

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<sup>1</sup> 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/Population_structure_and_ageing)

[http://ec.europa.eu/eurostat/statistics-explained/index.php/Educational\\_attainment\\_statistics](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](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](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>

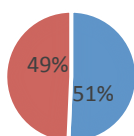
## CZECH REPUBLIC

Authors: Renda Bellmallem, Tomislav Tkalec, Lidija Živčič

### DEMOGRAPHY, ENERGY CONSUMPTION AND ENERGY SUPPLY

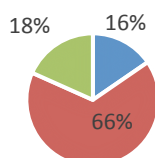
#### GENDER PROFILE

■ Female ■ Male



#### AGE PROFILE (2016)

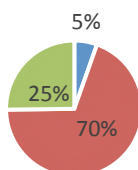
■ 0-14 years ■ 15-64 years ■ 65+ years



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

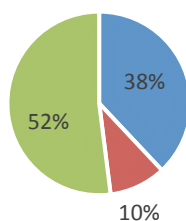
#### EDUCATIONAL PROFILE (25-54 Y, 2016)

■ Low (ISCED 0-2) ■ Medium (ISCED 3-4) ■ High (ISCED 5-8)



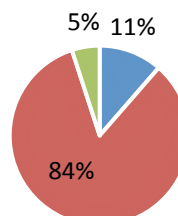
#### COMMON DWELLING TYPES (2015)

■ Detached ■ Semi-detached ■ Flat



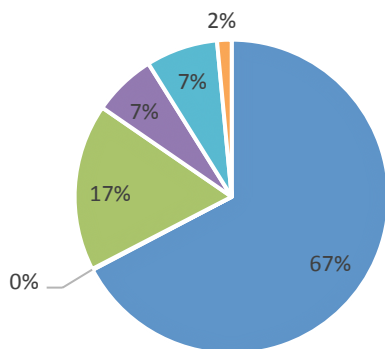
#### URBAN - RURAL DISTRIBUTION (OECD)

■ Predominantly Urban ■ Intermediate ■ Predominantly Rural



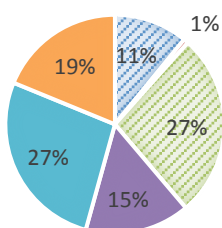
### RESIDENTIAL FINAL ENERGY CONSUMPTION BY TYPE OF END-USE (2015)

■ Space heating ■ Space cooling ■ Water heating ■ Cooking ■ Lighting and appliances ■ Other



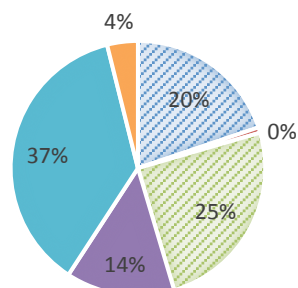
### SHARE OF FUELS IN THE FINAL ENERGY CONSUMPTION IN THE RESIDENTIAL SECTOR (2015)

■ Solid fuels ■ Petroleum products  
 ■ Gas ■ Derived heat  
 ■ Renewable energies ■ Electrical energy



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

■ Solid fuels ■ Petroleum products  
 ■ Gas ■ Derived heat  
 ■ Renewable energies and waste ■ Electricity



### FINAL ENERGY CONSUMPTION FOR HOUSEHOLDS, PR CAPITA (2015)

7.380 MWh



## ENERGY SYSTEM AND ENERGY POLICY TRENDS

### Energy system

The Czech Republic favours domestic resources (black coal, lignite) in order to limit its energy dependence. Fossil fuels are dominant in the energy mix (75.1%), because the economy is driven by industry (38% of GDP). But their share tends to decrease in favour of nuclear energy and renewables. The country is a major producer and small exporter of coal on the European scene, despite a steady decline in its production (46 million tonnes in 2015). EPH is a Czech production and distribution company of electricity founded in 2009.

Coal plants produce 60% of the country's electricity. They are mostly located near the deposits. The most powerful, with around 1,500 MW, is the Prunéřov thermal power plant near the German border. Oil production is limited to thousand barrels/day, with some wells in the south-east of the country. The country imports the majority of its oil, mainly from Russia. Production is also limited for natural gas: the country meets about 2-3% of its needs for these two fuels (oil and gas). The rest of the natural gas is supplied by Russian Gazprom. Natural gas plants play a secondary role, but there is a political will to expand them. Nuclear power accounts for almost one fifth of the energy supply, about 30% of the country's electricity. Czech nuclear power is produced by ČEZ. Two nuclear power plants exist at Dukovany (four VVER reactors of 440 MW each) and Temelín (two reactors of the same sector of 900 MW each). The electricity grid is highly interconnected with neighbours, and the country is the third largest net exporter of electricity in the European Union, after France and Germany.

In terms of renewable energy, there is the presence of hydroelectricity, with dams, but they contribute very little to the production of electricity. Wind energy is little developed, with only 280 MW installed at the end of 2015. On the other hand, photovoltaic energy has developed very rapidly: non-existent in 2005, the fleet reached 2150 MW at the end of 2015, contributing 2.3 TWh to electrical production. Renewable energy increased by 42% between 2010 and 2014, with a preponderance for solar and biofuels. The energy market has been open since 2005, and consumers can choose their energy supplier individually. But most Czechs were at ČEZ before liberalization, and very few have changed suppliers.

### Particular socio-material aspects that influence energy consumption

Although there are programs and financial aid for energy refurbishment of homes, there are still a lot of energy-inefficient dwellings, which means that a lot of energy is used for heating of homes. In some cases that also leads to the problem of energy poverty. The history of the country has impacted the strategies and developments in terms of energy choice. The Czech Republic was part of the Eastern bloc, and after the end of the Cold War, the choice to liberalize and privatize a large part of the energy was in opposition to the Soviet past. In the early 1990s, Prague initiated a strategy to diversify its supplies, particularly to Norway and Germany, with the rest coming from Russia. In 2010, the country imported 67.63% of its gas from Russia, 20.47% from Norway, and 8.78% from Germany. In 2015, the share of Russian gas decreased to 54.22%, while the share of gas from Germany increased to 25.1% and that of Norwegian gas decreased to 5.14%; these data are however to put into perspective since the gas coming from Germany and Norway is actually Russian gas re-exported.

### **Current Trends in Energy Policy**

Due to the European commitments on greenhouse gas reduction targets on the one hand, and the rising cost of extracting domestic mining resources on the other hand, the Czech energy strategy updated in May 2015, confirms the decrease of the share of coal in the energy mix and its compensation by nuclear, as well as, to a lesser extent, gas and renewables. For the moment, coal remains the most important component of the energy and electrical mix. The Czech Republic plans to respect its commitment to energy-climate policy, with a 13% share of renewable energy in final energy consumption by 2020, revalued at 15.3% by the Government in early 2016. These measures aim to decrease the share of fossil fuels in the energy mix from nearly 75% to 66% in 2030 and 56% in 2040. It should be noted, however, that the Czech Republic is one of the European countries with one of the highest levels of greenhouse gas emissions, and ecological issues are not political priorities. This can be explained by structural features: the weight of energy-intensive sectors, ageing power plants and heating units, dependence on road transport, the large number of energy-inefficient dwellings. Furthermore, the government is questioning the idea of developing renewable energy because it is more expensive and more uncertain. This future transition is a major social issue, threatening thousands of jobs in the east and north-west of the country where the major mining basins are located. By way of illustration, the bankruptcy of OKD, the largest black coal operator in the country, based in Moravia-Silesia, could lead to the loss of 12,000 jobs in the region already hard hit by unemployment. The government wants to extend the life of Dukovany NPP. A National Action Plan on nuclear development was adopted in June 2015 detailing the details of nuclear projects. Regarding waste management, the country is considering the construction of a deep layer landfill for storing the most hazardous waste (faces local opposition of pre-selected sites).

According to the Czech energy strategy, electricity produced in 2040 will come from domestic sources (lignite and black coal, nuclear, renewable and secondary energies), 80%, compared to 70% in 2015. The electricity mix should be mainly composed of de-carbonized, nuclear and partly renewable energy. About two-thirds of the oil imports go to the transportation sector, and diesel is used a lot. 78.1% of the oil consumed by the Czech Republic is consumed by the transport sector. But, with the goal of increasing renewable energies, prospective national programs are developing in favour of electro-mobility.












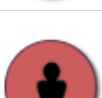
### **Trends in national campaigns**













National programs and campaigns are supporting investments in energy savings in both renovation and new construction, as well as installation of heating sources that utilise renewable energy. There are several of the initiatives that are focusing on renewables – also in the form of showing best practice examples. In terms of the scale and number of the initiatives, they are mostly focusing on energy efficiency (in various forms and measures), followed by renewables and sustainable mobility.

Campaigns and initiatives are run by different stakeholders: national institutions, research institutions, NGOs and other actors, and can be divided in national/regional programs, European projects and local initiatives. Initiatives that were identified by the ENERGISE team are partly reflecting the trends from energy policies, especially related to energy efficiency, while support for RES is represented in the initiatives (that are mainly run by non-governmental actors), while it is lacking in the main national policy orientation.

## OVERVIEW OF NATIONAL SECIS

Below please find a list of Czech 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.*

START2ACT		Changes in Everyday Life Situations
Accelerated Penetration of Small-Scale Biomass and Solar Technologies (ACCESS)		Changes in Technology
TOPTEN ACT : Enabling consumer action towards top energy-efficient products		Changes in Individuals' Behaviour
Boosting efficiency in electricity use in 8 European regions (EL-EFF REGION)		Changes in Individuals' Behaviour
European Smart Metering Alliance (ESMA)		Changes in Technology
Common appliance policy – All for one, One for all – Energy Labels (COMEON LABELS)		Changes in Individuals' Behaviour
The Panel Scheme		Changes in Technology
Green light schemes		Changes in Technology
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
From Estonia till Croatia: Intelligent Energy Saving Measures for Municipal housing in Central and Eastern European Countries (INTENSE)		Changes in Individuals' Behaviour

Green Household		Changes in Individuals' Behaviour
SPIRIT - Energising Faith Communities (SPIRIT)		Changes in Individuals' Behaviour
E.ON Energy Globe Competition		Changes in Everyday Life Situations
Integration of Active Learning and Energy Monitoring with School Curriculum (ACTIVE LEARNING)		Changes in Individuals' Behaviour
Residential Monitoring to Decrease Energy Use and Carbon Emissions in Europe (REMODECE)		Changes in Individuals' Behaviour
The Green Savings programme		Changes in Technology
Hostetin Centre for Sustainable Rural Development, Czech Republic		Changes in Technology
Sluňákov : The Olomouc center for ecological activities		Changes in Complex Interactions
EPORE - Energy Poverty Reduction in Eastern Europe		Changes in Individuals' Behaviour
<u>Renovujdum</u>		Changes in Technology
Program Effect		Changes in Individuals' Behaviour
Renewable decade (Obnovljivi desetletji) competition		Changes in Individuals' Behaviour

## ‘GOOD PRACTICE’ EXAMPLE OF CZECH SECI



### START2ACT

## Engaging European Start-ups and Young SMEs for Action for Sustainable Energy

### Brief Description

The initiative (a H2020 project) wants to help young SMEs and start-ups save energy and cut costs at work by introducing simple yet effective energy efficiency measures into their daily routines. To achieve this, free-of-charge mentorings and training activities are offered in nine European countries, among them in Czech Republic.

### Contextualization

Even though each start-up and SME consumes relatively small energy amounts, the collective environmental impact of 20 million SMEs in the EU is massive, contributing to 64% of environmental impact. Active engagement of start-ups and young SMEs is essential in order to reach the 20-20-20 EU goals and there is market potential for almost all enterprises to cost effectively reduce their energy consumption. START2ACT will unleash the potential of energy savings at European start-ups and young SMEs via a set of innovative educational and capacity building measures.

### Aims and objectives

START2ACT aims to reduce residential energy consumption in the EU via changing the behaviour of consumers in their everyday lives by approaching them at their workplace. With a focus on European start-ups and young SMEs, the project aims at triggering action by young entrepreneurs and their emerging enterprises as well as by the owners and staff of young SMEs to introduce energy efficiency measures within their daily routines.

### Methods for intervention

The initiative is focused on providing free-of-charge knowledge and know-how transfer on implementing energy efficiency measures. A key area of intervention to increase energy efficiency through behavioural change is office equipment, the fastest growing energy user in the business world, consuming 15% of the total electricity used in offices, which is expected to rise to 30% by 2020. START2ACT aims to trigger the use and uptake of the many available tools and solutions offering a great potential for energy and money savings, yet not adequately used due to lack of understanding of how to use them in practice and due to insufficient engagement of people towards changing behaviour in everyday life. START2ACT aims also to trigger sustainable procurement of office equipment, including the selection and furnishings of premises (HVAC, lighting, etc.), and goods and services. In so doing, START2ACT will sow the seeds of a sustainable energy culture in start-ups and young SMEs.

### Steps of implementation

Activities of the initiative include:

- business breakfast for energy efficiency: START2ACT's experts provide the costumer with several energy saving tips at workplace while they enjoy their coffee and network with the other participants.
- on-site consulting for SMEs: a series of 3 free-of-charge training units at young SMEs. START2ACT energy expert trainers are visiting companies and developing a

tailor-made training with and for them. The pre-set but flexible modular structure guarantees high training efficiency.

- energy efficient mentoring for start-ups
- platform for Q&A on energy efficiency, administered by energy experts.

### **The role of the households**

The initiative is more focused on entrepreneurs and staff of young SMEs at their office and their energy related behaviour in their working place, but at the same time it introduces energy efficiency measures within the daily routines of households of the targeted young entrepreneurs.

### **Location**

Initiative is implemented in 9 countries and is not focusing only on one locality in the country. It is focusing on SMEs and start-ups in whole of the country.

### **Textual and communicative aspects of initiative:**

Communication and dissemination activities are focusing on young entrepreneurs, young SMEs and start-ups and less on other target groups. In that way they are not focusing directly on households and their energy use at home.

### **The physical/technological aspects of the initiative:**

START2ACT aims to reduce residential energy consumption in the EU via changing the behaviour of consumers in their everyday lives by approaching them at their workplace. It is focused on providing free-of-charge knowledge and know-how transfer on implementing energy efficiency measures, mostly in working place.

## **CONCLUDING REMARKS AND POLICY IMPLICATIONS**

The weight of energy-intensive sectors, ageing power plants and heating units, dependence on road transport and the large number of energy-inefficient dwellings should be the stimulation for Czech Republic to work towards energy transition, yet this is not the case. Environmental issues are not political priorities and the government is questioning the idea of developing renewable energy because it is more expensive and more uncertain. There are various programs and financial aid for energy refurbishment of homes. This is reflected to some extent in the SECI. When it comes to energy efficiency measures, there are quite many initiatives. When it comes to renewables, there are but a few. Many SECIs are focused on refurbishment of the buildings – from governmental programs and subsidies for thermally insulating multi-family prefabricated houses or individual housing to program on energy efficiency in municipal housing or platforms for efficiency refurbishment. Some SECIs focus on behaviour change for saving energy, be it by promotion of good practices, energy advising / information centres, competitions and learning in schools or by engaging faith communities in changing behaviour. Efficiency standards for appliances are an important issue, as well as some activities on stand by consumption and smart metering.

In the field of renewables there are a few SECI, promoting small-scale biomass and solar and offering support for heating installations utilising renewable energy sources. Energy poverty is highlighted as one of the socio-material aspects, but this is not highly reflected in SECIs, as there is only one identified SECI dealing with the issue of energy poverty. National policy works also towards electro-mobility, but this is not reflected in the identified SECIs, just two of which focused on mobility issue (one on working with local communities and one focused on biking).

The majority of SECIs focus on changes in individual's behaviour (12 of them), some less on changes in technology (8), even less on change in everyday life situations (3) and only one is addressing change in complex interactions. Most of the SECIs (14 of them) are cross-national, there are 8 national and 2 local. The SECI in focus offers support to young SMEs and start-ups to save energy and cut costs at their workplace, and at the same it introduces energy efficiency measures within the daily routines of households of young entrepreneurs. Mentoring and training activities are offered to young SMEs, a key area of intervention being the increase of energy efficiency through behavioural change is office equipment. The initiative aims also to trigger sustainable procurement of office equipment, including the selection and furnishings of premises and goods and services. The lessons learned are a few. Tackling energy consumption where it is felt the most – in the costs of the company – is a good starting point for tackling energy use in all other aspects of life. Offices, as an important trigger for increased energy use, can be a strong place also for reducing energy use, especially through energy efficient procurement. Young SMEs and start-ups are estimated to be a good target group to work with, because they are susceptible to new things and on a lookout for reducing their business costs. As for the informing of policy, the most relevant is the lesson that offices or workplaces in general, as major generators of increased energy use, are an important point where energy efficiency measures can be put in place, because there is the motivation of reducing costs; at the same time, workplace can trigger wider effects, such as change of behaviour in domestic life of employees and being the driving force for energy efficient office equipment.

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