

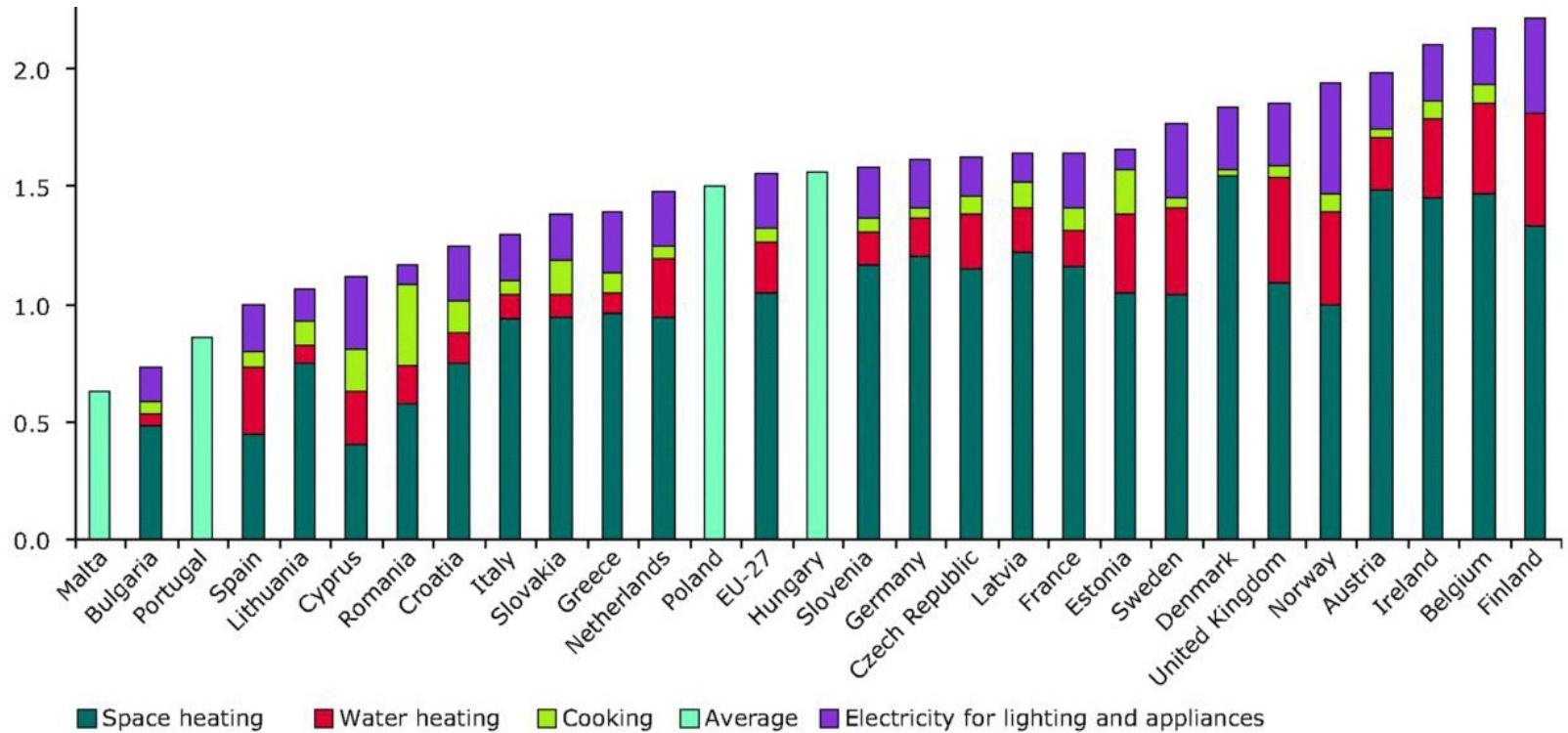


Building Market Briefs



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Source: Umberto Berardi / *Procedia Engineering* 118 (2015) 128 – 136;
 EAA, Primary energy consumption by fuel (CSI 029/ENER 026), European Energy Agency, 2015.



Sharpening focus



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Sharpening focus and content

CO-CREATION PROCESS



Co-creation workshops with the community

(26+ participants x 2)



Literature research

(1000+ documents and reports)



Target group interviews

(I.e. technology suppliers, etc.) / (x 26)



Literature study

incl. LinkedIn profile / (x 120)

Content



Building Market Briefs

Content



Summary of key national framing conditions and major trends



Market size and building stock morphology



Potential market size of bringing the building stock to 2050 targets



Insight into key market **stakeholder groups' perceived barriers**



towards

action, decision criteria and needs

Local market experts' comments on the content, targeted

Chapter A (literature based)

- Statistical data from public international (Eurostat) and national sources
- Methodological aligned data to allow comparability of national sources
- Information on building codes, subsidy schemes and policy

Chapter B (survey based)

- A survey covering the complete value chain and all stakeholders
- An assessment on technology solutions and preferences by building typology and project type
- Barriers and drivers to technologies by stakeholder group
- Decision drivers and influence of different stakeholders on specific decisions

Chapter C (building stock model based)

- Synthetic building inventories of buildings that allow for exact modelling
- Two market development scenarios, on based on current policy and one target scenario
- Market volumes per technology in different RoI segments (from high to low profitability)

Layout Structure

Subchapter
Title/ Subtitle

Legend

Links to additional
reports or market
experts comments
(subjective,
qualitative)

A3

Energy, Emissions, Climate Goals Introduction to the energy mix, emission profiles and implications of climate goals

USEFUL READINGS

G. BFE 2017. Swiss Energy Strategy 2050. Bundesamt für Energie (BFE), Bern. www.bfe.admin.ch

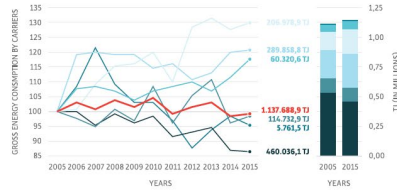
N. Swiss nuclear phase-out: Energy supply challenges, 2012, ETH e-collection library ethz.ch

Sources:
Bundesamt für Umwelt (BAFU);
EUROSTAT

■ Total Petroleum Products
■ Solid Fuels
■ Gas
■ Waste (non-renewable)
■ Nuclear Heat
■ Renewable Energies
■ All Products

Switzerland's gross energy consumption has reduced at an average annual rate of -0.07% in the period 2005-15. Oil and nuclear energy constitute more than 60% of the current energy mix¹. In September 2011, the Federal Council and Parliament decided in favour of systematic scaling down of nuclear energy which will result in a complete decommissioning of nuclear plants by 2035². In terms of renewable energies, proportion of renewable energy in gross consumption stood at roughly 18% in 2014, up from 14% in 2005.

A3.1 – A decade since 2005, the Swiss total gross energy consumption decreased by 1.15%. The likely phasing out of nuclear by 2035 will lead to gradual dependence on other energy sources, including energy efficiency.



In 2015 Switzerland consumed roughly 58,000 GWh of electrical energy. 32.2% of this was consumed by households. The Swiss electricity mix is dominated by hydro (56%) and nuclear power (38%). The resulting average emission factor of the electricity produced is 0.24 kg CO₂/kWh. Electricity prices range between 0.05 EUR/kWh_{max} and 0.26 EUR/kWh_{min} with an average price of 0.17 EUR/kWh_{avg}. The significant price variation between different areas (45% between highest and lowest) mainly stems from differences in the production cost, procurement costs and the different mixes of the utilities. In the last 10 years the average electricity price per kWh_{max} has increased by +1% per annum.

USEFUL READINGS

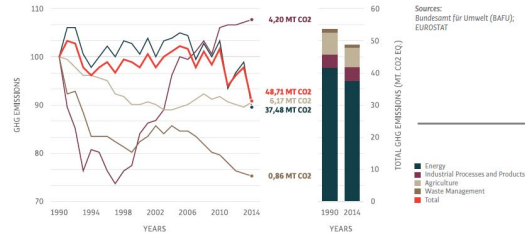
BFE 2016. Analysis of energy consumption by specific use. Bundesamt für Energie (BFE), Bern. www.bfe.admin.ch

EXPERT COMMENT: THM

Heat production in the residential building sector of Switzerland is dominated by heating oil (44%) and natural gas (25%) and electricity (18%). The average resulting emission factor is 0.23 kg CO₂/kWh_{max}. Heat energy prices range between 0.05 EUR/kWh_{max} and 0.18 EUR/kWh_{min}. The price variation between is notable (236 % between highest and lowest) and mainly comes from the choice of energy carrier and the efficiency of the heating system. While urban buildings generally have access to gas or district heating, in rural areas oil based systems dominate. Oil based systems in rural areas are more likely to be exchanged by electrical and wood based systems, as grid building expenses can be prohibitive. The rate of electrical energy consumption to heat energy consumption in Swiss buildings on average is 1 to 2.77.

The energy consumption by households thus directly translates to emissions attributable to buildings. In 2014 the building sector contributed 11.88 Mt CO₂ equivalent emissions or over 24% of the total Swiss emissions. Since 2005, building sector emissions fell by -30.7% at an average annual rate of -3.45%. Since 1990, the building emissions reduction has been almost the same or -30.5%.

A3.2 – Since 1990, Swiss total direct CO₂ emissions decreased by 9.3% while building sector emissions reduced by 30.5%. Switzerland is responsible for 0.1% of global emissions. While its total emissions remained stable in the range of 55-63 Mt, from 1990 to 2014, its emissions per capita have decreased by 27.53% (6.25 t CO₂/capita in 1990). While on an m² scale the emission reduction is extrapolated to be 34%.



It must be noted that while in the same period (since 1990), residential building space to be heated increased by 36% (from 3.15 mio. m² to 4.29 mio. m²) and the Swiss population increased by 23.3% (from 6.7 mio. to 8.2 mio.), the overall emissions reduced. A slew of energy efficiency measures, to meet Switzerland's climate commitments, helped in achieving this.

Switzerland, a signatory of the Kyoto protocol, met the 8% emission reduction target (from 1990 levels) for the first phase up to 2012. The domestic target was divided among several sectors and since fossil fuels usage in heating and transport were major contributors to Swiss emissions, policies in general focused on buildings and transport. In its national CO₂ law (2000), Switzerland adopted a joint CO₂ emission reduction target for heating, process fuels and transport fuels of 10% below 1990 levels in the period 2008-2012. In 2008 a revenue-neutral tax was also introduced on stationary fossil fuels. Its revenues were partially earmarked for the building refurbishment programme.

For meeting the obligations of second phase (2013-20) of Kyoto, the country passed the CO₂ Act (2013-20). This act prescribes emission reductions by 20% from 1990 levels to be achieved in 2020 through domestic measures. Instruments such as a CO₂ tax on heating fuel, are aimed at letting fuel importers share part of the emission burden due to transport, stringent emission reductions for new cars and the Buildings Program.

In the run up to the Paris conference in 2015, Switzerland was the first country to submit its INDC that aimed to reduce greenhouse gas emissions by 50% relative to 1990 levels by 2030. In this at least 30% of the reduction is to be achieved domestically while the remaining abroad. Switzerland also put forward a long-term target of 70% - 85% emissions reduction by 2050 comparing 1990. The targets, if achieved, will result per capita emissions to reach 3 tonnes of CO₂ equivalents in 2030, and between 1 and 2 tonnes of CO₂ by 2050³.

USEFUL READINGS:
J. UNEFCC 2015. Intended Nationally Determined Contributions. United Nations Framework Convention on Climate Change (UNFCCC). www.unfccc.int

Intended Nationally Determined Contributions

Graph

Main text
(objective,
quantitative)

Benefits per Target Group



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Benefits per target group



Low-carbon technology and innovation suppliers:

- Identifying the most relevant markets segments and business opportunities
- Diagnose of stakeholders' specific need in the market, especially property owners and customers.
- Link with local market experts' network



Country/EU policy makers and property investors will be able

to extract a pan- European overview of comparable market information enabling them to benchmark situation in different markets.



Climate-KIC

A map of Europe with 18 colored dots indicating the locations of the study. The dots are distributed across various European countries, including the United Kingdom, Ireland, France, Germany, Poland, Czech Republic, Slovakia, Austria, Hungary, Italy, Greece, Spain, Portugal, Sweden, Finland, Norway, and Denmark. The dots are colored dark blue, green, and light blue.

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Thank you for your attention

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Back-up Slides