

POLICY BRIEF

Empowering energy consumers by increasing their energy literacy



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What is the issue and why is it important?

Energy-related issues are becoming increasingly important in the public debate and often lead to polarising discussions. At the same time, it is essential for the success of the green transition that consumers are empowered to make sustainable and informed decisions about their energy consumption. This is particularly important regarding the acceptance of new technologies or energy-related regulatory conditions. Accordingly, it is necessary to **promote an objective, non-polarised discourse on the relevant topics in the public**. An indispensable building block contributing to this is the highest possible level of energy literacy (and related financial literacy) among the population.

The term energy literacy describes **the general knowledge regarding issues connected to the production and consumption of energy, particularly in regard to sources of energy, the scale of production and consumption, prices, and influence on the environment** (Białynicki-Birula et al. 2022). Therefore, increasing energy literacy can contribute to several important objectives:



Empower consumer to understand their own energy consumption (e.g., in households) and to save energy



Empower consumer to understand the pricing of energy and/or the effect of new tariffing scheme (Reis et al. 2021)



Tackling energy poverty



Raise awareness on important energy related topics and increase acceptance

However, energy consumers (e.g., in households) often lack knowledge about energy (van den Broek 2019; Martins et al. 2020) and are not able to situate different points of view in the public discourse or important aspects that affect their own energy consumption (e.g., appliance purchase decisions (Blasch et al. 2019)). Since already internalised behaviours and habits are much more difficult to change and influence than newly learned behaviours, **the promotion of energy literacy is particularly important for children and pupils as the energy consumers of tomorrow.**



What we did in the NUDGE project

The Horizon 2020 project NUDGE has conducted **surveys, interviews, and focus groups with consumers** to understand the factors that influence their energy consumption.

It has taken a mixed approach to the consumer analysis and intervention design with tasks combining surveys and field trials.

Firmly rooted in behavioural science methods, it has been studying individual psychological and contextual variables underlying consumers' behaviour to tailor the design of behavioural interventions and to evaluate their effectiveness.

In this context, one field trial investigated interdisciplinary project-based education on home energy consumption for children in Belgium.

By expanding the **existing teaching material, installing smart meters in the children's homes and schools, and using dashboards to visualise the collected consumption data**, the aims were to:

- Improve the children's understanding of the impact of different daily choices on household energy consumption,
- Promote intergenerational learning, and
- Create opportunities to replicate the acquired knowledge.

What we learnt



- ▶ In general, the **energy knowledge** of the pupils was very **limited** (e.g., most children have no idea how their house is heated, no knowledge about the different dimensions and magnitudes of energy consumption).
- ▶ **Public debate** of energy-related topics (e.g., energy prices) fostered interest in the subject.
- ▶ **Gamification** (e.g., energy knowledge tests) and **social comparison** were quite popular. The children liked comparing their consumption with the others and with means, both for water and for energy.
- ▶ A **tool to measure home energy consumption automatically (digital)** including a comprehensive visual dashboard is essential to allow pupils (but also all other household residents) to follow their own consumption, to compare it, and to understand the impact of different daily decisions.
- ▶ **Intergenerational learning** can have positive effects but is hard to assess/evaluate.

What can policy makers do?



Teaching on energy, energy consumption/measuring and energy efficiency should be strengthened in public schools and other education places.

To improve energy literacy, energy and energy consumption should be taught as a compulsory subject in public schools. An important aim here is to ensure that as many children as possible know how homes are heated/cooled in general and in practice, that they have a rough idea of how it works and what it costs, and that they are aware of different heating options as well as the impact of their behaviour on the general energy consumption. In addition, it is also important to use not only schools but also other educational places. This can help to reach also parents or other people to increase energy knowledge across the whole population and support replication potentials.



Pushing the smart-meter roll-out and ensure that easy to understand and easy to use dashboards are included to visualize the measured energy consumption.

Giving access to a tool to follow the energy consumption at home is key to raise awareness on the topic of energy consumption and to enable people to understand their own consumption as well as the impact of their behaviour and habits.



Encouraging actions for different energy user profiles of children and parents to save energy (see also the other policy briefs of the NUDGE project).



Investigating and understanding energy literacy levels among different population groups to address them appropriately (there is still a lack of common understanding as well as specific data on this topic).



Use also non-educational channels to raise awareness and empower consumers to understand their own energy consumption.

Understanding and being aware of one's own energy consumption is key to being able to change related behaviour. This awareness also helps to raise acceptance and understanding with regard to new technologies or new regulatory conditions. Therefore, also non educational channels should be used to foster energy awareness and literacy. This could include regularly occurring situations such as heating system maintenance or energy bills, including all relevant information on the energy consumption, the respective prices and/or energy saving potentials in a way which is visually appealing and easy to understand.



Encourage interpersonal communication within households about energy consumption/ production to foster intergenerational learning and knowledge replication (e.g. by public information campaigns).

Conclusion and key findings

Bringing energy topics and the related knowledge, which is particularly relevant for everyday life, closer to the end consumer is an essential task of politics.

A particular focus here should be on children and schoolchildren as the energy consumers of tomorrow.

Nevertheless, it is also important to **address and include all other population groups** in order to exploit replication potential and increase energy literacy throughout society.

Here, the approaches chosen must always be adapted to the target group and the corresponding channels.

To be able to do so:



It is important to investigate and understand energy literacy levels among different population groups.

In any case, it is of the utmost importance to provide users with insights into their energy consumption, preferably in real time (e.g. via smart meters and corresponding visual energy consumption dashboards that are intuitive to use and as easy to understand as possible).

In the NUDGE project, the focus was on teaching energy topics to schoolchildren. Thus, **the field study in Belgium can serve as an example of how these topics can be taught in practice.**

An important factor here is the **freely accessible teaching material in several languages** that was created as part of the project. The material can be used as a basis for implementing the relevant lessons quickly with as few barriers as possible and integrating them into various curricula.

Teaching material



5 [open-source booklets](#) to teach about:

- gas consumption,
- electricity consumption at home,
- water consumption,
- electricity outside the home and
- nudging (with a quiz based on questions the children made).

Please note the booklets have been developed for Belgian students, and might therefore need to be adapted to other countries' specificities.

The content is meant for cognitively strong children from grade 5 and 6 and suitable for all children / teenagers in secondary school.

Further reading/ Literature

- ▶ [Knowledge-hub • Nudge \(nudgeproject.eu\)](#).
- ▶ Białynicki-Birula, Paweł; Makiela, Kamil; Mamica, Łukasz (2022): Energy Literacy and Its Determinants among Students within the Context of Public Intervention in Poland. In: *Energies* 15 (15). DOI: 10.3390/en15155368.
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- ▶ Van den Broek, K.L. (2019): Household energy literacy: A critical review and a conceptual typology. In: *Energy Research & Social Science*, 57, 101256, <https://doi.org/10.1016/j.erss.2019.101256>.
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- ▶ Blasch, J.; Filippini, M.; Kumar, N. (2019): Boundedly rational consumers, energy and investment literacy, and the display of information on household appliances. In: *Resource and Energy Economics* 56, p. 39. <https://doi.org/10.1016/j.reseneeco.2017.06.001>.



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