


Power to the people !
*(a Swiss perspective on the public's knowledge and expectations
regarding energy)*

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Abstract

This study is based on a large sample (n=756) of respondents in French-speaking Switzerland. Though the sample is biased in some respects (strong academic qualifications, high voting record...), key findings here should remain valid in a more representative sample while some would actually be reinforced.

- **A strong worry about environmental and climate issues**

Only 3% of respondents would consider not to be (or only slightly) preoccupied by these questions.

- **Mobility seen as the strongest lever citizens can act on to help the energy transition**

When asked how to help the Swiss energy transition, transport issues are by far the ones quoted most frequently, especially car use / more soft mobility (40% of the time), less flying (13%) or cleaner cars (12%). Energy issues are completely associated in the public's mind with environmental issues as many answers concern energy only indirectly (waste sorting, less purchasing, eating local food...).

- **Nuclear is not known to be a low-carbon (nor generally safe) energy source**

Regarding knowledge on renewable energies', the general public seems very supportive and informed of their benefits. Coal and oil are rightly seen as the two major dangers to climate and human lives. A striking result is how wrongly nuclear energy is seen as climate impacting, particularly among women (only 17% know it to be a low-carbon energy) and people without higher education (19%). Nuclear is also perceived to be far deadlier than it is, once again mostly within those 2 population segments and in comparison to views on gas (wrongly seen as safer) or hydro (rightly known to be generally safe).

- **Individual transport's carbon impact very underestimated**

Even though individual transport is by far the most CO₂-emitting sector in Switzerland, when asked which one is most responsible, the top answer (also by far) given by citizens is Industry, hinting at the fact that the population feels individual actions are largely outweighed by companies' impacts.

- **Acceptance to pay more for cleaner energy**

80% of respondents said they would be willing to pay more for cleaner energy, the majority of which not wanting to go higher than 500.-/year. Even if this response is consistent with other surveys, the declarations do not always transfer into acts, as could be seen recently with taxes on fossil fuels being an important factor in the rejection of the CO₂ law.

- **Connected objects would be key for consumer demand flexibility**

Roughly a quarter of respondents say they would strongly lower their energy consumption through a raise in price energy or through appeals to civic mindedness. Those 2 levers also have very similar results regarding the possibility of shifting the time for power consumption. The lever which would be most effective to manage demand in order to avoid power consumption peaks (with a strong impact for almost half of respondents) would be for connected devices to do the thinking of consuming when more appropriate.

- **Many individual daily gestures deemed acceptable but not limiting digital use**

Most respondents are ready to do their part with daily gestures, to install an app telling them when to lower their consumption or supportive to force landlords to insulate property. Less popular actions include : limiting the use of digital, shifting cooking times or investing savings in projects with ecological value but little financial benefit.

- **Open mind to e-vehicles and soft mobility, but carsharing far from being widely accepted**

The responding car owners were globally very open to favor soft mobility for short trips or to acquire an electric vehicle even if costlier on purchase. Even in this rather eco-friendly panel, the private car remains a very personal and emotional possession as carsharing seems to be a hard limit.

- **Environmental issues rank as top expectations for the future of the transition**

Though the panel of respondents was obviously eco-friendly, it is striking to see the environmental criteria ranked of higher importance than ones such as price or security of supply. Coming first was the preservation of natural areas and landscapes with air quality as a close second.

- **95% consider Energy to be a key topic and wish for more teaching to the population**

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1 Introduction

Over the past few years, climate change, environmental issues and energy supply have been steadily making their way up in the top concerns of the Swiss population[1].

Major changes have also happened in the country's policies, most notably the signature of the Paris agreement[2] in order to limit climate change and the announcement in 2019 to aim for a Carbon Neutral Switzerland in 2050. Meanwhile, a popular vote put in place a new law on energy[3] sporting strong measures such as prohibiting the construction of new nuclear plants or supporting the rise of renewables through taxes, funding and regulation. Regarding greenhouse gas emissions, the Swiss citizen's footprint is actually around 13t-CO₂/year[4] whereas IPCC reports that the remaining carbon budget would be a world average of 2t-CO₂/year per citizen[5].

As in every country, the citizen has a role to play as :

- a consumer (studies suggest the consumer's decisions can lower personal GHG emissions of approximately 16-25%[6][7] without even taking into account the impact of demand flexibility)
- an investor (approximately an additional 20%[7])
- as a voter

But whereas in most countries, the citizen only elects the political representatives who will take care of these matters, in Switzerland, the power to vote directly on such vital and complex issues needs to have a population having the basic knowledge in order to make an informed choice. It is one thing to demand measures for sustainability but it is another to act on it at the right scale. The popular votes approving the Energy Strategy 2050 and later rejecting the CO₂-law[8] has shed light on the difficulty of matching expectations and acceptable paths of action.

As a citizen baffled by the contradictions between the talk for sustainability and opposing vote results on concrete actions to be taken, I was interested to delve into general knowledge and opinions on energy-related matters.

The purpose of this study is to have an overview of :

- the level of knowledge about energy and the "energy transition" of the average Swiss resident
- whether or not more information should be taught to the population and which one
- acceptance of changes regarding consumption habits
- expectations regarding the transition

These fields of study and more (climate change, voting intentions...) are already at the core of the annual consumer barometer[9] led by Uni St-Gallen since 2011. This is why the survey leading to the present study has been designed in order to be complementary rather than redundant. When appropriate, parallels will be drawn between the two studies.

2 Data and methods

2.1 Scope and method of the study

This quantitative study was led through an online survey in French and distributed to Swiss citizens and residents of the French-speaking area, with a minimum age of 18. As questions involved not only voting issues but also consumption habits or expectations, foreigners' opinions were deemed important as they represent approximately 25% of the Swiss population.

The survey itself was composed of 4 separate sections (Awareness and self-perception of knowledge, Energy quiz, Acceptability of behaviour changes as a consumer, Expectations regarding the energy transition) and required an average time of 15-minute in order to be completed. A 5th section would ask personal details such as gender, age, level of study, etc. in order to identify biases from the responding population.

The data was collected from February to April 2021 and the sample was drawn from different sources of contacts : author's own private network in Romandie and subsequent redirections, door-to-door requests to fill out the survey in a middle-class district in Lausanne, distribution of more than a thousand slips of paper with a link to the survey in various areas (VD and VS cantons). Monitoring the profile of respondents then led to correcting measures in order to have a more representative sample by sending out the request to certain under-represented groups of gender, age or political orientation (i.e, Femmes PLR Suisse Romande, Mouvement des Aïnés Fribourg, GenuineWomen. . .).

The survey was anonymized to ensure their answers reflected their thoughts but respondents could decide to leave their contact data if they wanted to receive information, especially answers to the "energy quiz" section. All questions were mandatory except from Q4 (free text).

2.2 Response rate and sample analysis

This study is based on a sample of 756 respondents fitting to the previously mentioned criteria. Given that the survey was forwarded organically through successive lists of contacts, posted on social networks, sent electronically to different groups of unknown sizes asking for redirection, it is impossible to give a good estimate of the response rate, though a minimum of 2000 people have been contacted in one way or another.

Despite best efforts, the sample of respondents cannot be considered representative of the Swiss population. The obvious first reason is that the outreach was limited to French-speaking Switzerland but other biases appear when comparing the respondent's profiles with Swiss national data :

- A more masculine sample : 54% of respondents are male though they are 49% of the Swiss adult population
- A **sample with a highly academic record** : 63% of respondents have obtained a tertiary diploma (Bachelor, Master or PhD) when it is only the case for 30% of the Swiss adult population
- A **left-wing political bias** : in terms of political preferences, 39% of respondents identified their views as left wing, 28% as center-minded and 13% as right wing. The other 20% either could or preferred not position themselves in these terms. Based on National Council vote shares[10], it is clear that right-wing voters are clearly underrepresented in the sample as they are still the first political force in the country.
- A **sample with a high voting record** : whereas only 42% of the Swiss population had voted on the Energy Strategy referendum in 2017, 64% of respondents had versus only 13,5% who had not voted. The remaining 22,5% didn't remember / weren't allowed to vote at the time (because of nationality or age)
- A **sample disproportionately comprised of 25-39 years old** : 39% of respondents are in this age class compared to 25% of the Swiss adult population. Ages 18-24 and 40-64 are slightly under-represented while the 65+ is strongly under-represented (16% of respondents vs 23% of the adult population).
- A slightly rural sample : 66% of respondents live in urban & suburban areas compared to 73% of the Swiss population

Focusing on what seems to be the strongest bias "academic qualifications" (having ensuing consequences in terms of purchasing power or voting record), **we will mention when the under-represented population (no tertiary diploma) of the sample gives significantly different answers.**

Even if biases have been identified, an answering total of 756 respondents, with all profiles represented to some extent, is by far the biggest sample of respondents in French-speaking Switzerland on the topic and bound to bring some key findings. In comparison, the nationwide Consumer Barometer[9] boasts 1021 respondents spread through Switzerland's various linguistic regions.

2.3 Limitations of this study

A strong limitation of this study is the multiple biases previously described preventing the sample to be judged representative of the Swiss population.

Another one is that given the survey's length (15-20mins) and complexity of some questions, it is likely that the vast majority of respondents are already more aware, interested and concerned by energy issues than the average citizen. That is reflected in the high voting record on the energy strategy 2050.

A third one is that given the financial situation of the respondents' has not been assessed even though it is very likely to be, on average, higher than that of the average citizen given the biases identified regarding education level. Thus, it may well be that answers related to the pricing of energy commodities do not reflect the worries of a significant portion of the population for whom this factor is crucial.

The Sotomo institute (specialized in Swiss political analysis) was contacted for more expertise on these biases. Sotomo's feedback indicated that for such an online survey, such political and socio-demographic biases were normal.

3 Survey results

3.1 Self perception of respondents' awareness and knowledge level

The first set of questions were designed to probe whether respondents felt concerned by environmental issues and knowledgeable on the subject of energy transition and its related aspects, as well as identifying what bells the words "*energy transition*" ring.

Q1 : How worried by environmental and climate problems are you ? (1: Not at all, 5: A lot)

On average, the respondents were very sensitive to those issues with an average of **4,0/5**.

Q2 : How much effort do you put to minimize your environmental impact ? (1: Not at all, 5: A lot)

On average, the respondents did put quite a lot of effort in their acts with an average of **3,6/5**.

Q3 : How high do you judge your level of knowledge on energy and environmental issues, and the solutions needed to be implemented ? (1: Not at all, 5: Very high)

On average, the respondents did consider they had a rather good knowledge on these questions and what needs to be done with an average of **3,5/5**. Only 13% of respondents gave a sub-average score of 1 or 2.

Academic qualifications bias : on each of these 3 questions, the under-represented population scored 0,1 lower than the rest of the sample which wouldn't affect much the overall result.

Q4 : When hearing the words "Swiss energy transition", what are the 2-3 actions you think of that the citizen can do to help at his own level ?

This was the only "open" question of the survey and answering it was not mandatory, but 702 respondents filled in the field, giving more or less detail. All these responses were analysed, subdivided into 1973 single suggestions, compiled in 55 unique different answers. Those single answers were then regrouped in sectors in order to have an insight at the macro level.

It is interesting to note how intertwined (and almost inseparable) energy and environment issues are in the public's mind, as some of the most popular answers did not have a direct connection to the Swiss energy transition (i.e purchasing vegetables without packaging, buying less "stuff"). Answers and sectors not judged to be directly related to the Swiss energy transition are indicated in a lighter shade of blue.

Figure 1 shows the most popular single answers in frequency of apparition. The answer *Renewable production* was not redistributed to other more precise categories as interpretation was too difficult. Based on other answers, renewables are most associated with electricity, so this answer would at least mean PV panels, which is already one of the most popular answers, but in some respondents' minds it would also mean thermal renewables.

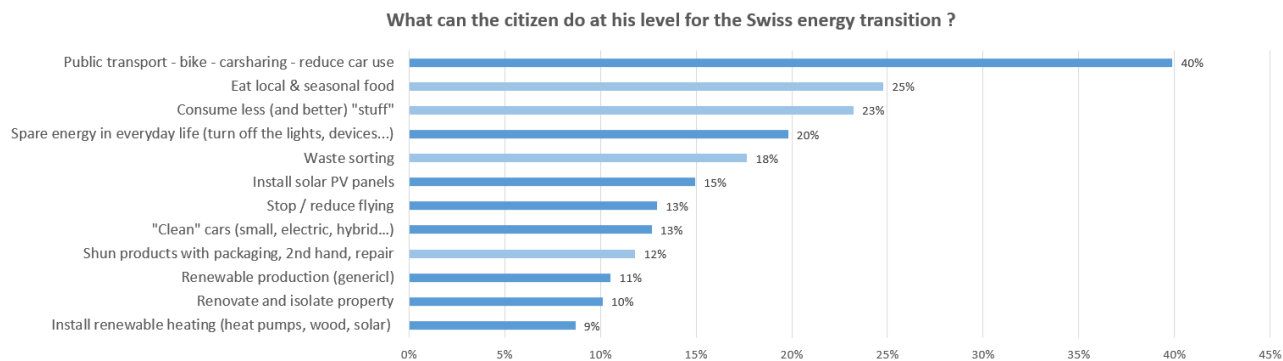


Figure 1: Actions most frequently mentioned for the citizen to help

It is interesting to note that some concepts which are often mentioned as necessary for the future of the energy transition, such as *e-Vehicle2Grid*, *Personal battery for PV storage* or *Flexibility of demand / Smart consumption / Smart houses* have barely been mentioned (respectively 0, 1 and 3 times).

Figure 2 aggregates these measures in larger sectors in order to show what directly comes to the citizen's minds when talking about energy transition. In this figure 2, thermal renewables have been attached to the *Heating & Habitat* sector whereas the generic answer *Renewable production* was associated with electric renewables answers in the *Power production and consumption* sector.

Mobility comes far ahead with 555 mentions as the main sector coming to mind with all that is related to soft mobility, "clean" vehicles, carsharing, smaller distances and the reduced use of plane transport. Next in line comes the recycling of waste, reduction of goods consumption and the reduction of packaging (**Buy less, buy better, no waste**, 383 mentions) followed by the consumption of local, seasonal, organic and vegetarian food (**Eating habits**, 254 mentions), both sectors which can be judged to be only indirectly linked to the subject.

Housing renovation, insulation, smaller habitats, lower temperature at home and the switch to cleaner heating sources come in fourth position under **Habitat & Heating**, 211 mentions. In fifth position comes the

Power production & consumption sector (197 mentions) including notably the deployment of PV panels and the consumption of renewable power contracts. Close behind are **Energy savings** (186 mentions) which from comments usually mean turning off electric devices, efficient appliances and lighting. The last meaningfully mentioned sector is a citizen aspect labeled **Learn & Vote** (84 mentions) including the need to understand the subjects, inform others, vote for the right politicians and parties, protest, choose responsible banks...

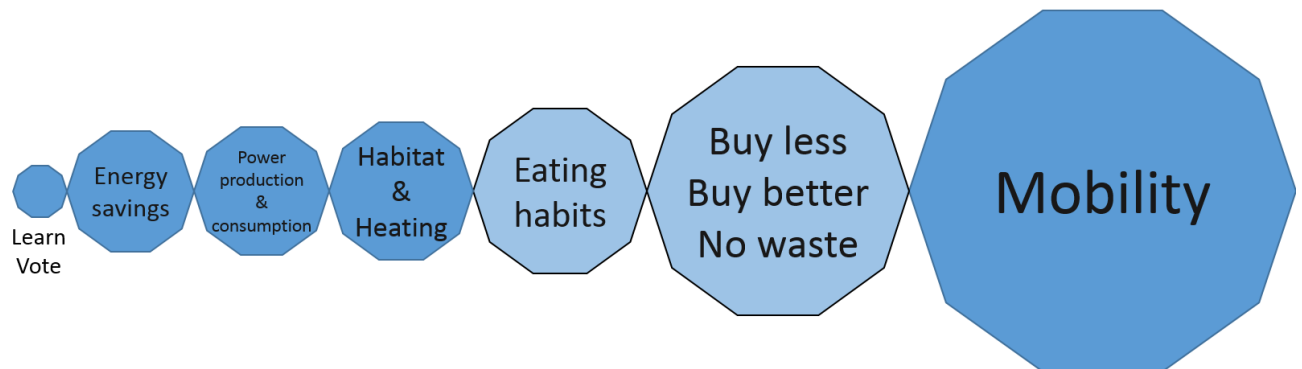


Figure 2: Sectors most often mentioned where the citizen could have impact

3.2 Respondents' knowledge on energy and climate issues

In this part of the survey, participants are asked to answer "quiz" questions regarding basic concepts on energy and the Swiss transition so as to evaluate the citizen's average level of knowledge.

Q5 : How much does the use of these energy sources contribute to climate change ? (0: Very little; 2: A lot; *No Opinion* available)

Figure 3 compares the average perception of citizens asked to give their thought on a basic 3-level scale (in blue) with the real emissions (in orange) for each energy source (worldwide median emissions according to IPCC[11]).

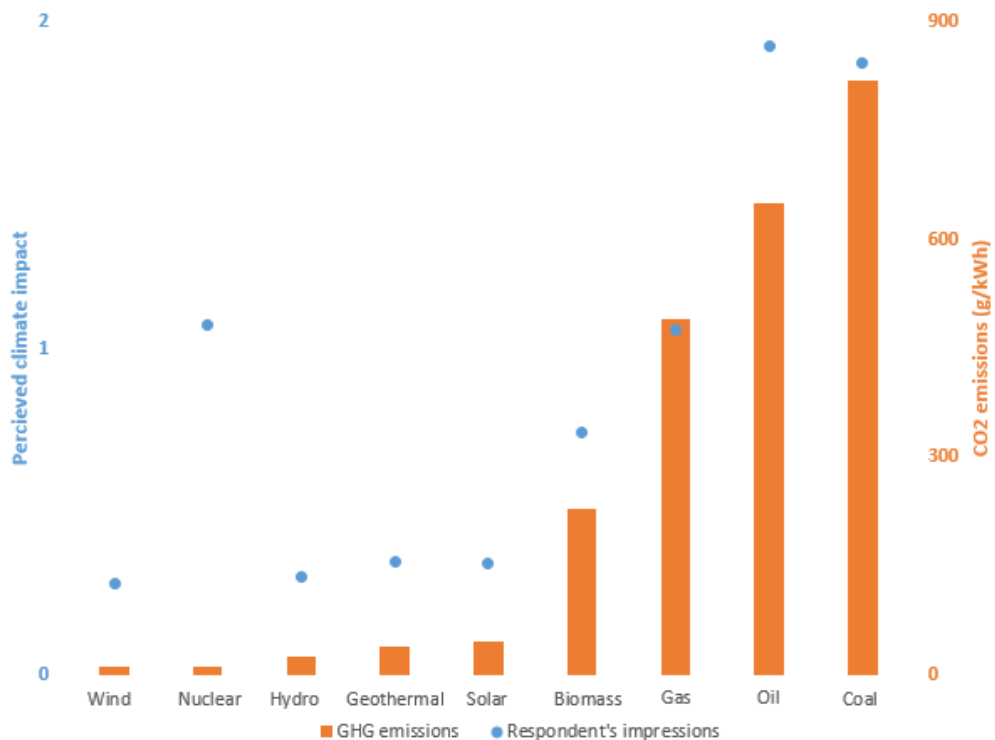


Figure 3: Climate impact of energy sources : perception and reality

One takeaway from this question is that **respondents are well aware of the low carbon impact of**

renewable energies (save biomass which is a scientifically hotly disputed subject) **as well as the fact that oil and coal are the two most carbon-heavy sources** (oil even being perceived slightly worse as coal). Fossil gas is rightly perceived to be less but still meaningfully impacting (1,05 perception) and biomass' official numbers are always difficult to interpret because of the very large variability depending on conditions of growth and use from one country to another, but it is rightly deemed to figure higher than other renewables.

The other takeaway from this question is how little it seems to be known that nuclear energy is a low-carbon source, only 31% of respondents answering so and an average 1,07 perception.

Academic qualification bias : the misunderstanding on nuclear is even much stronger with the under-represented population in which only 19% of respondents know it to be a low carbon source with a perception soaring to 1,32 (whereas in the same population, fossil gas is seen low-carbon by 23% and a perception of 0,97). **Gender bias** : as the Consumer Barometer[9] had shown a strong gap between genders regarding nuclear energy, it seems worthy to explore this bias on this particular question. **The gender gap is indeed very significant with only 17% of women acknowledging nuclear power as low-carbon (1,38 perception) while 43% of men do (0,82 perception).**

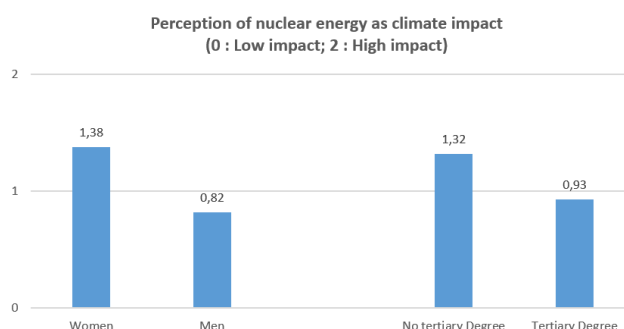


Figure 4: Perception of climate impact of nuclear energy in 2 sub-groups

Q6 : Rank these 5 energy sources from what you think is the safest to the deadliest one (considering accidents + pollution) for the same amount of energy. (coal, gas, hydro, nuclear, oil)

This question examines the citizen's perception regarding the questions of danger / risk for the 5 existing energies providing large-scale power at will. Hydro reservoir and nuclear are technologies with high danger / low risk while fossils have an opposite profile with smaller accidents but permanent mortality increase through air pollution. This question is not written making specific reference to Swiss production since there has never been a deadly accident due to hydro or nuclear catastrophes in Switzerland, so the range has been extended to a global point of view.

Literature on this criteria[12][13][14][15][16] is clear that the safest sources by far are paradoxically the ones having caused the biggest catastrophes : hydro reservoirs and nuclear (both sources having comparable numbers). Fossils are one or two orders of magnitude behind, and consistently rank as follows : gas would come in 3rd position, oil in 4th and coal is the deadliest energy (especially brown coal aka lignite, largely used in neighbouring Germany).

Figure 5 compares the average rank given by respondents (in blue, 1 being the safest and 5 being the deadliest) with the actual fatalities due to these energy sources (in orange). The most recent and reliable numbers would be the JRC report[12], but as it gives different numbers between subcategories (OECD or not, China in-/excluded, GenII or Gen III of nuclear), for the sake of simplicity, we illustrate Fig.5 with the single entry data given by OurWorldInData[14][15][17]. Given that the orders of magnitude are consistent between the different sources, taking this particular data should not raise any issue.

Results show that respondents trust hydropower (average position 1,4) which, though its potential danger, they know to be the safest source, as well as correctly identify oil and coal as the 2 deadliest energy sources (respectively 3,9 and 4,2). Fossil gas is rightly perceived to be less deadly than other fossils (2,3) while **nuclear is wrongly seen as much more deadly than it really is, being ranked far behind gas (3,2) even though data shows fatalities are actually 40x inferior.**

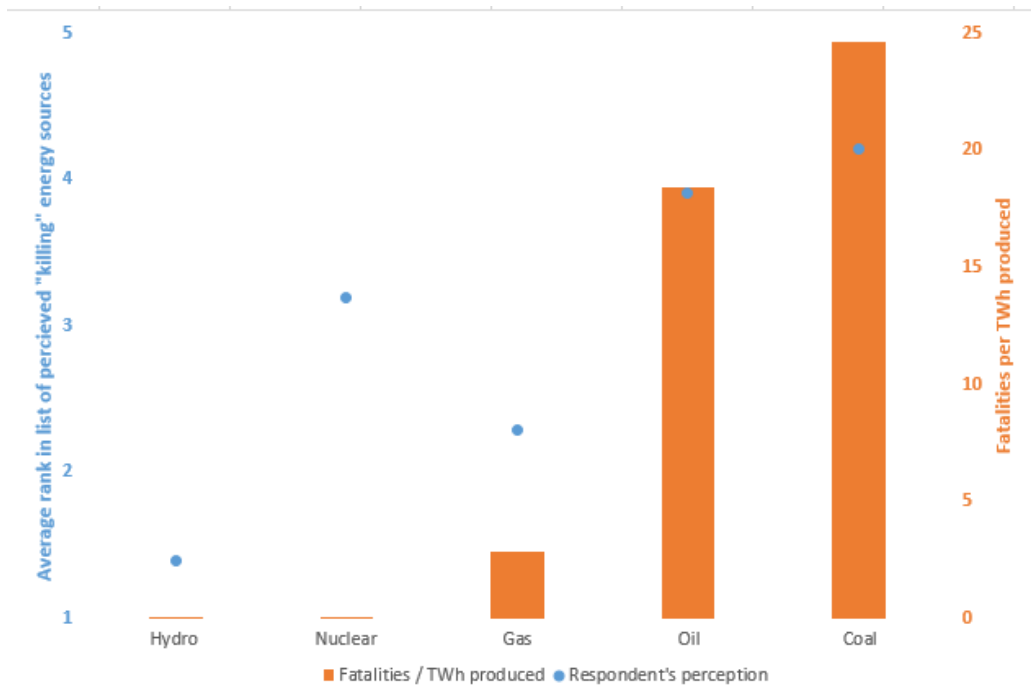


Figure 5: Perception of fatalities due to energy sources

Academic qualification bias : the misperception on nuclear risk is even much stronger with the under-represented population ranking it on average at 3,48 while the over-represented sample of tertiary degree holders rank it at 3,03.

Gender bias : as for Q5, because the Consumer Barometer[9] had proved a gender gap regarding nuclear energy, we also explore this bias on this particular question. The gender gap is even more significant with women ranking on average nuclear power at 3,67 versus 2,77 for men. **40% of women think nuclear to be the deadliest of energy sources** whereas this is the case for only 16% of men.

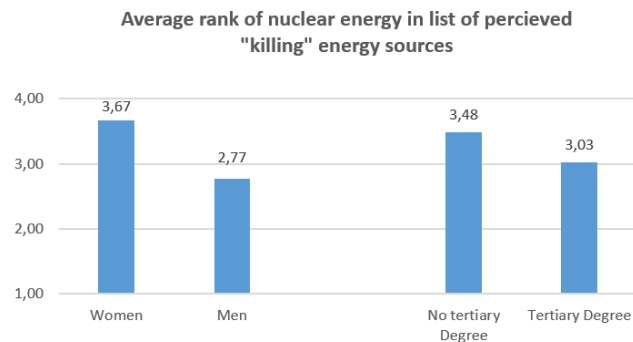


Figure 6: Perception of fatalities caused by nuclear energy in 2 sub-groups

Q5 and Q6 addressed important questions relevant to all major energy sources and not energy-specific questions. It is very likely that the important issue of radioactive waste (specific to nuclear) has an impact in the global perception of the public of this energy source, even on criteria where it has little or no impact.

Q7 : In Switzerland, which of these sectors do you think is the highest emitter of CO2 ? - 5 propositions : Power production / Transport / Buildings use / Agriculture / Industry

The correct answer here would be **Transport** (35% of Swiss emissions with Buildings and Industry respectively at 27% and 20%) with private vehicles amounting to 3/4 of this sector[18][19]. **In the sample's answers,**

the impact of Transport is underestimated as only 23% place it as the highest emitting sector, behind Buildings (ranked first by 25% of respondents) and far behind Industry (ranked first by 42%).

Academic qualification bias : in the under-represented sample, Industry is even more seen as the highest emitter, and so when correcting the data for this parameter, the global podium would be Industry (45%) far ahead of Transport (23%) and Buildings (22%). **One could surmise from this data than even if Mobility was cited in Q4 as the first sector on which a citizen could have an impact on the energy transition, the carbon impact of individual Mobility is very much underestimated compared to Industry.**

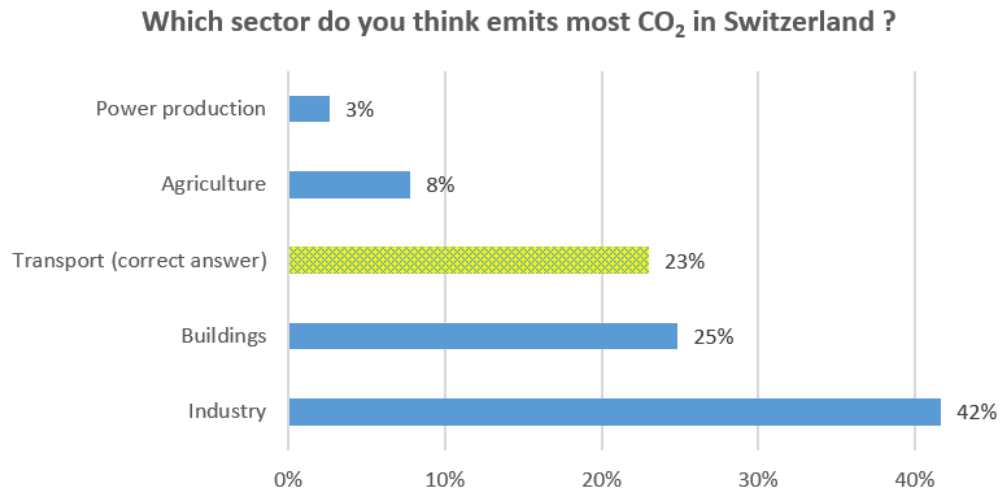


Figure 7: Sector perceived to be in first position as the highest carbon emitter

Q8 : What portion of the energy used today in Switzerland is from fossil sources (oil, gas, coal) ? 5 propositions of 20% intervals

The correct answer here would be **60-80%** (approximately 50% of Swiss energy is consumed in the form of oil products, 15% through gas and very little coal)[18]. The sample's answers are quite close to reality with 34,9% giving the correct answer, just behind 40-60% (36,2%). Only 24,4% underestimate greatly the current dependence on fossils by answering less than 40%. No significant difference can be observed through the academic qualification bias.

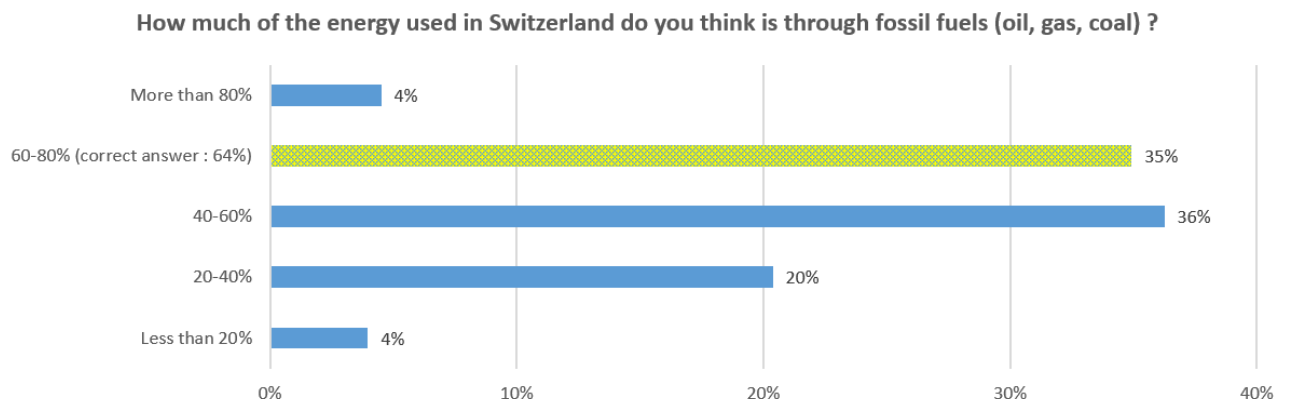


Figure 8: Perceived current use of fossils in the Swiss energy mix

3.3 Acceptance of behaviour modification regarding energy consumption and use

Q9 : How much more would you be willing to pay to switch to 100% renewable energy (electricity, heating, transport...) in order to reach Switzerland's targets ? 5 propositions

Even though the cost of electric renewables is quickly dropping, and some sources are now competitive regarding production costs (wind, utility scale PV), the integration on a high scale of variable sources is more than likely to raise system costs such as transmission, distribution, storage or back-up[20]. Regarding renewables for other sectors such as heating or industry (biogas, syngas, biomass...), competitiveness will likely depend on higher CO2 pricing, leading to a general increase in the price of energy. It is therefore important to know how willing is the population to pay extra to reach a clean energy mix.

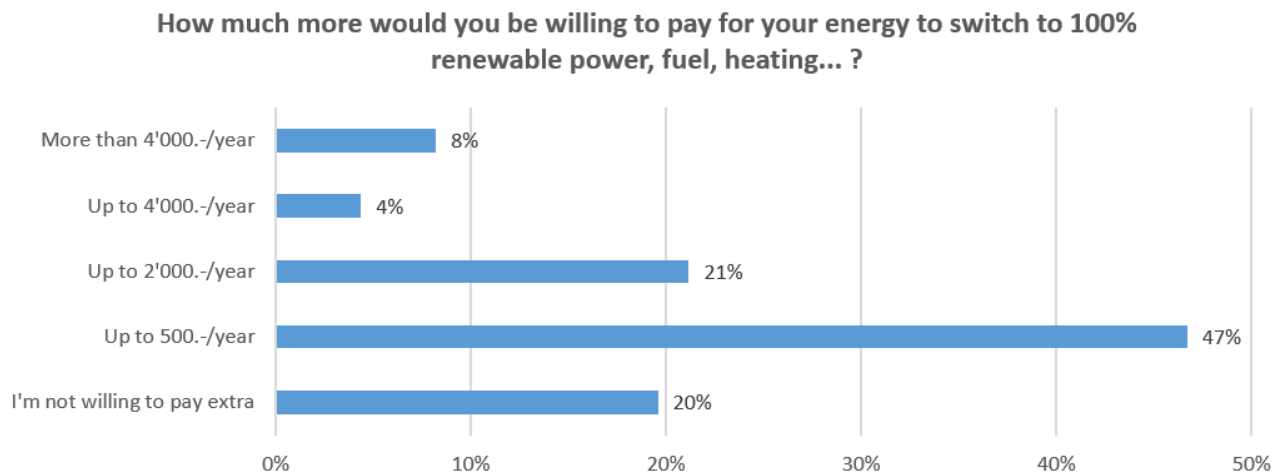


Figure 9: Willingness to pay more for 100% renewable energy

From our sample, **80,4% of respondents were ready to pay extra, among which 46,7% would not go higher than a limit of 500.-/year** for their total energy consumption. This is consistent with a recent poll where 78% of citizens said they were ready to pay more (95.-/year median, regardless of revenues) for their electricity bill[21].

Academic qualification bias : as could be expected given that this question speaks in raw amounts and not in income percentage, we can see a difference in the underrepresented sample, quite likely to have a lower income. However, the proportion of people in that sample ready to pay extra for their energy bill is still at a high percentage of 74,2%, among which 49,1% who would not go higher than 500.-/year.

One must still keep in mind that not all those who say they would pay more would actually do so, as a strong offset has often been seen between preliminary polls and actual actions / votes (for instance, regarding the CO2-law vote[8]).

Q10 : Would the following make you lower your energy consumption ? (No, Somewhat, A lot)

The two suggestions to lower energy consumption are a raise in energy price or a call to civic-mindedness.

Both results (Figure 10) are pretty similar with approximately half the respondents saying those measures would have some impact, the other half being split between "No impact" or "A big impact".

Academic qualification bias : The only slightly remarkable difference would be towards the raise in energy price. The underrepresented sample is less likely to change behaviour because of it (24% stating it would have no impact on their consumption vs 19% for holders of a tertiary diploma).

Q11 : Would the following make you change when you consume energy ? (No, Somewhat, A lot)

As demand flexibility is also key in integrating a high share of variable energy sources, it is important to know if customers are ready to accept a change in habits and comfort in order to avoid demand peaks. The three suggestions to change the habits on when to consume energy are a raise in energy price, a call to civic-mindedness and the deployment of connected devices.

Figure 11 show results for the two first parameters (price and appeal to civism) to be similar to Q10 with more than half of respondents going for the middle answer. The third suggestion of **having connected devices "doing the thinking" of consuming when most appropriate is seen as being the best option by far**

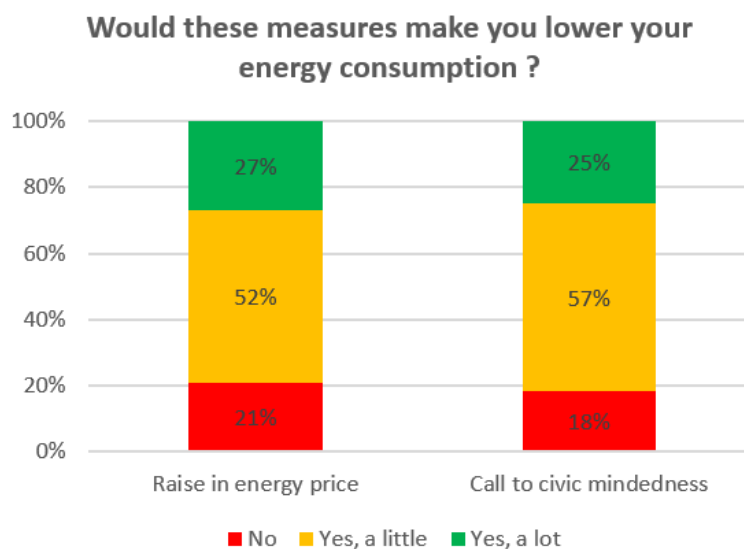


Figure 10: Impact of price raise or call to civic-mindedness to lower energy consumption

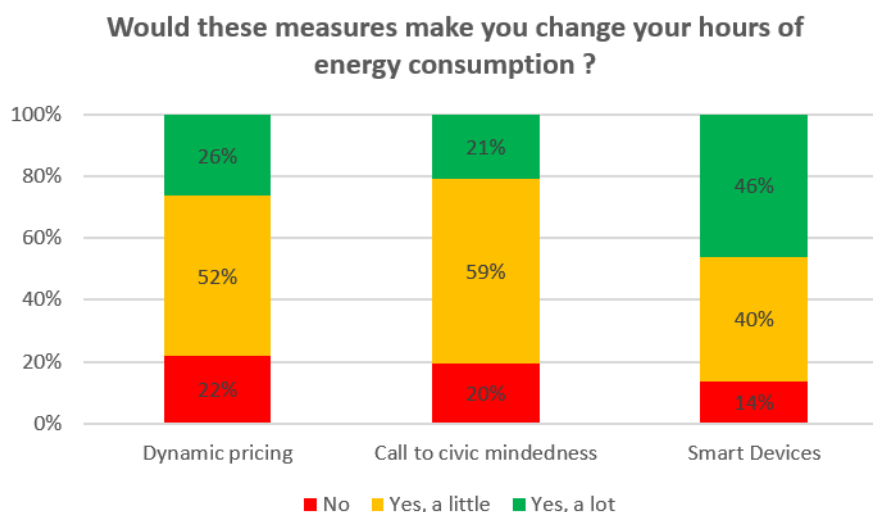


Figure 11: Impact on time of energy consumption of dynamic pricing, call to civic-mindedness or SmartDevices

(46% saying it would change a lot). IoT, 5G and SmartGrids are likely to be essential regarding accepted demand-side management.

Academic qualification bias : The only slightly remarkable difference would be how much connected devices would affect the moment of energy consumption. It is judged less likely by the underrepresented sample to have a large impact on their consumption profile (41% stating it would have a strong impact on when they consume vs 49% for holders of a tertiary diploma) but remains by far the most popular answer.

Q12 : Would you be willing to accept the following... ? (No, With difficulty, Yes)

In this question, we probe the public's opinion on different actions related to lowering energy consumption, limiting consumption peaks or willingness to support energy transition politically or financially.

Some suggestions are globally easily accepted by the sample of respondents :

- 78% would be willing to limit their hot water consumption in the bathroom (no baths, shorter showers...)
- 77% would be willing to launch appliances (dishwasher, washing machine...) outside of peak hours. The question suggested night time as the appropriate moment as it is now, but in a future Switzerland relying heavily on solar power, daily hours could become more appropriate.

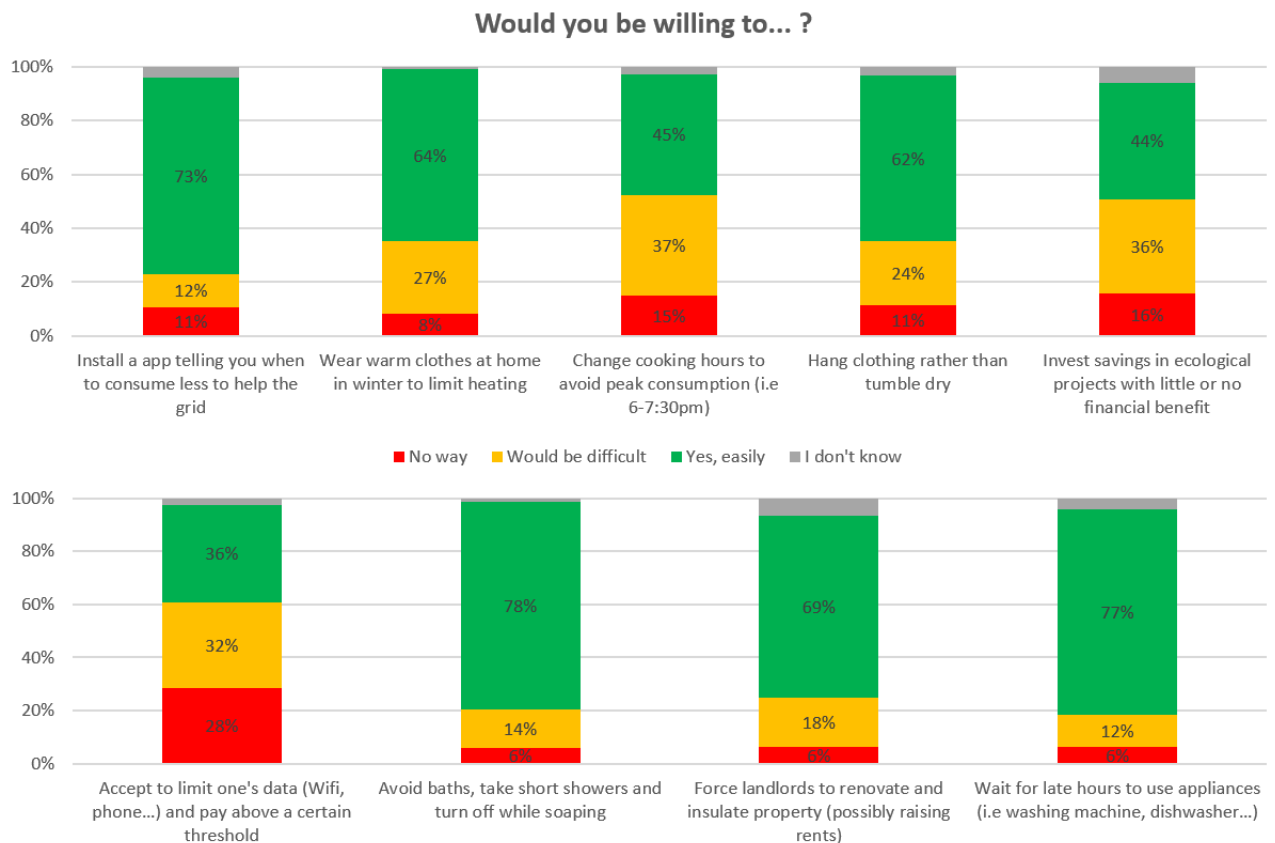


Figure 12: Acceptability of measures of behaviour change in daily life

- **73%** would be willing to install an app' telling when to limit consumption to help the grid (similar to RTE Eco2Mix App in France)
- **69%** support the idea to force landlords to renovate their property, even if that leads to a global increase of the prices on the rental market
- **64%** would be willing to heat less and wear warm clothes at home in winter
- **62%** would be willing to dry clothes by hanging them instead of using the tumble-dryer, even in winter

The measures having below-average support even in this rather eco-friendly sample :

- **45%** would be willing to shift their cooking times outside of the peak of demand (i.e 6pm - 7:30pm)
- **43%** would be ready to invest money in projects of ecological added value bringing little/no financial profit
- **36%** would accept thresholds for Data consumption on phone & home subscriptions above which one has to pay for more, in order to limit the use of digital-use energy and induced carbon emissions

Q13 : As a vehicle driver, would you be willing to accept the following... ? (No, With difficulty, Yes)

In prelude to this question, we ask the respondents if they own (or plan to, somewhere in the future) a motorized vehicle. In order to shorten the duration of their survey and to have more significant answers regarding car use, the 17% who answered they don't ever plan to have a vehicle are redirected to Q14 and do not participate in this question.

Some suggestions are globally easily accepted by the respondents (N=625) :

- **87%** would be willing to use soft mobility instead of the car for short distances (less than 2kms)
- **66%** would be willing to choose the smallest / lightest vehicle model for their needs
- **63%** would be willing to invest in an electric vehicle even if slightly more expensive on purchase
- **59%** would be willing to look for e-bike or public transport options before deciding whether or not to use the car

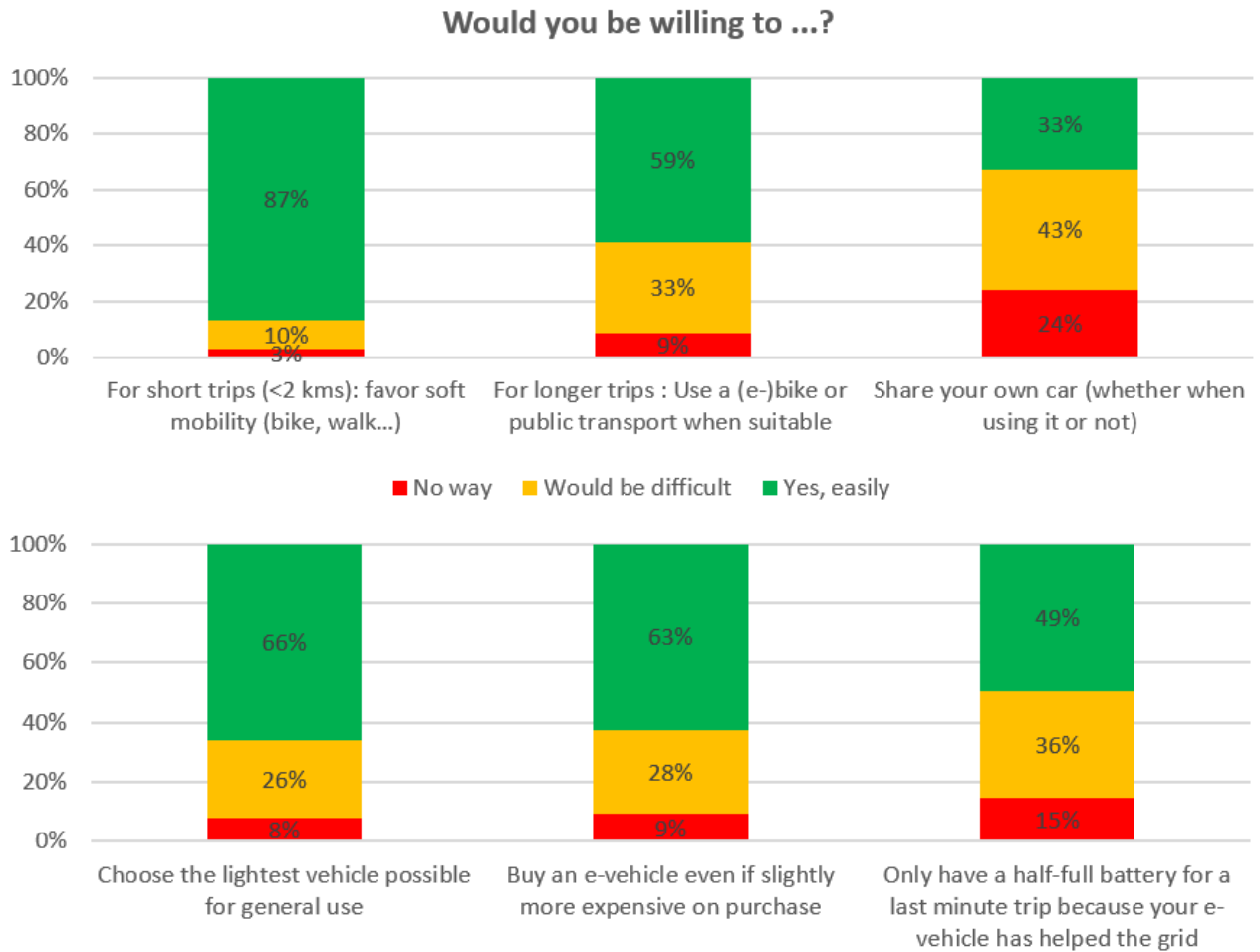


Figure 13: Acceptability of measures of behaviour change regarding vehicle use

The measures having below-average support even in this rather eco-friendly sample :

- 49% would accept to have an only half-full EV battery ready when deciding at the last minute to use the car because the vehicle has helped the electric grid
- 33% would be ready to share their car (whether taking passengers on a specific trip or even on a more global scale by sharing days/times of use with other people).

Academic qualification bias : the answers from the underrepresented sample are constantly lower than the general sample, indicating that **the acceptance of such measures would be clearly lower in the general population**. The biggest difference is regarding the electric vehicle which 71% of tertiary diploma holders would be willing to purchase vs only 50% for the underrepresented sample.

3.4 Expectations regarding the energy transition

In this question, we ask respondents to rank 7 key factors of the energy transition from the one they find less important (1) to the one they find most crucial (7). In order to compare the results, we will then average the ranks given to each criteria and rank them from "least important" to "most important".

Votes are quite spread throughout all key factors as results range from a minimum of 3,22 to a maximum 4,83 on a 1-7 scale.

These results confirm that the respondent sample is very eco-friendly with the 4 ecological criteria judged to

be the most important ones and the price of energy being the less important, which does not really match the recent CO2-law result, rejected by 51,6% of the voters mostly for economic reasons[8].

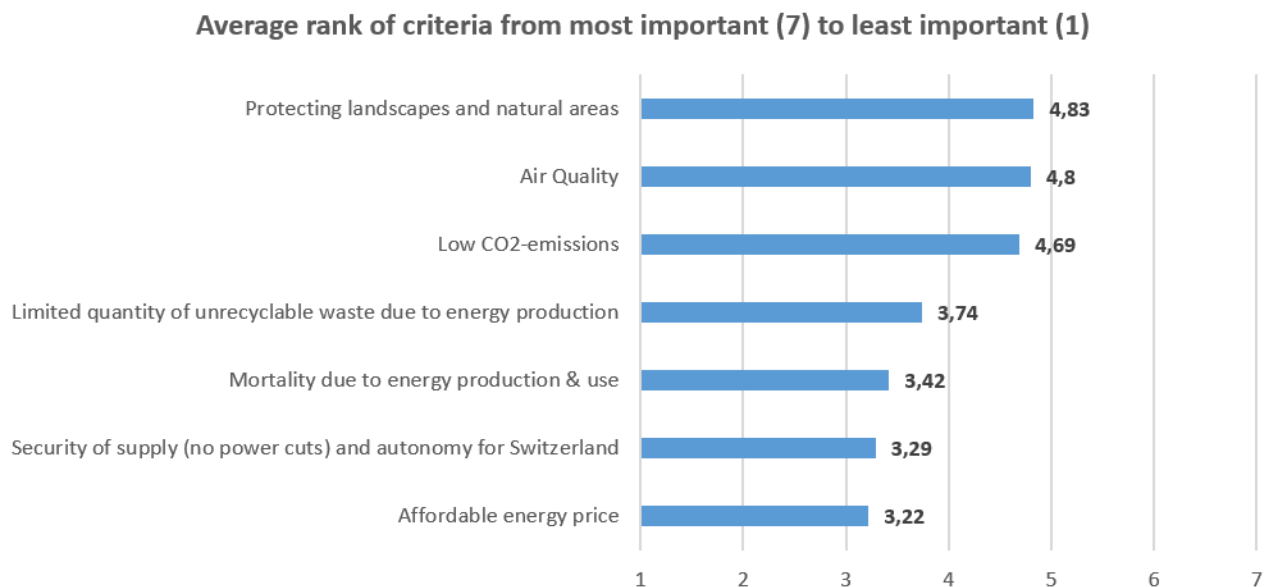


Figure 14: Energy transition criteria ranked from most important to least important

Interesting to see how low "Security of Supply" features, as it is normally judged as a non-negotiable priority by stakeholders. Switzerland boasting an extremely reliable grid for the past decades, one can wonder if the general public is aware of economic and social consequences relative to power-cuts and energy shortages (as has been seen in the Texas 2021 power crisis).

3.5 Need for energy education

The final question of the survey asked the respondents whether they thought the subject of energy should be the object of more education to the general public.

More than 95% of respondents answered that more education should be given in that field, especially in mandatory school (88.4%). One must keep in mind that though it was probably not the case when most of the actual respondents were in school, energy is part of the programme today in all french-speaking cantons. It can be taught in Geography lectures and is taught in Science lectures of pupils aged 10-12 and 15 years old, according to official programmes[22].

Other ways of information are more or less supported :

- 63.9% think these issues should be taught in High School and University
- 56,7% think adult training on the subject should be given in companies, public services, political parties, etc.
- 42,3% think neutral information should be given through energy providers' bills

4 Results' interpretation

This research aimed to evaluate the level of awareness of the general population on energy matters and harvest data on what paths could be acceptable for the energy transition. Based on this quantitative analysis, it can be concluded that Swiss citizens know transport to be the principal lever on which they can act to help along, even if they tend to underestimate its impact compared to other sectors, especially industry.

Regarding energy production sources, results show a rather good level of knowledge, to the notable exception of the subject of nuclear energy where the views are very excessively negative in comparison to actual data. Any major change of policy regarding the phase-out of nuclear energy would definitely need to address first the

Do you think energy issues should be taught more to the Swiss population ?

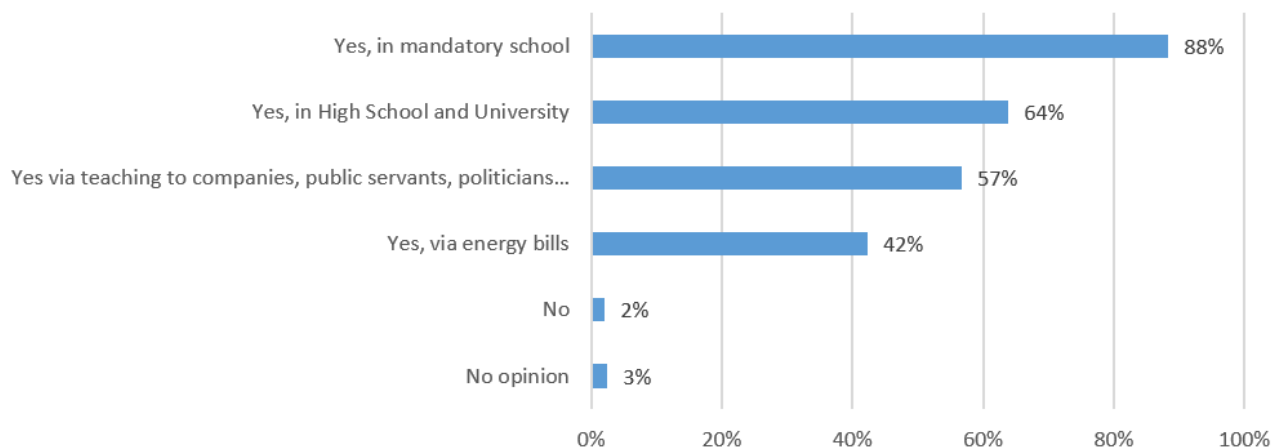


Figure 15: Ways in which more information regarding energy matters should be given to the population

question of distorted public perception.

As for behavioural changes, results show a population globally willing to act on such various factors as paying more for energy, sparing it or using it in a more efficient way. However, even if stated from the start that this large ($n = 756$) sample could not be considered representative of Switzerland, different questions have clearly shown (in comparison to popular votes) the sample to be much more "eco-concerned" than the global population. This is probably also heavily reflected in the expectations regarding the transitions where the environmental issues (landscape and nature preservation, air quality, carbon emissions...) are judged significantly more important than practical ones (price, security of supply and impact on peoples' lives).

One would also need to be careful with these results and not them for granted as final votes rarely reflect the initial view. This has been seen with the rejection of the CO₂-law which was initially very well received by polls, and the actual declared support for the future Glacier Initiative vote (67% of declared support[9]) which is sure to erode.

5 Outlook

To improve the reliability of these results, future studies could address with more statistical robustness the key findings. Weighting methods[23] could be used on the data to compensate for a specific bias. Having a representative sample, less eco-friendly than the one from this study, would probably give very different results in the areas of behaviour change acceptance and priorities of expectations. One could try to obtain a sample similar to the voters' profile described by the Voto-study on the Energy law 2017[24]. Such a study would give precious information on which direction to take for stakeholders before submitting a law to public vote.

An overwhelming majority of respondents considering energy to be a crucial enough matter to push for more knowledge transfer to the global population, public entities should look into possibilities for new ways to increase awareness.

Survey data

Data is available upon request.

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