

**OECD Nuclear Energy Agency  
STEERING COMMITTEE FOR NUCLEAR ENERGY**

**The Perception of Science, Risk and Nuclear Energy: An International Survey**

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## 1. Scope of the survey

In November 2022, the OECD Nuclear Energy Agency (NEA) launched an international survey in the framework of the Global Forum on Nuclear Education, Science, Technology and Policy. The survey sought to explore the links between an individual's core values and their perception of science, risk and nuclear matters.

It is important to recognise, as detailed in the methodological note below, that the survey was not intended to seek out representative views of the public. A much more comprehensive survey would be needed to assess general views.

The survey respondents are not representative of the population of the participating countries and the results show an overrepresentation of some types of respondents. Consequently, the results must be used with care and only for their intended purpose, always keeping in mind the nature of the sample and the size of the sub-samples utilised in identifying and investigating potential correlations. The findings should be seen as indications that invite further investigation, not as definite proofs of correlations.

This working paper is a first step in the results' analysis. It presents the main findings of the survey but does not offer analysis of the reasons behind the correlations that are noted. The findings will hopefully generate further research that will provide a detailed understanding of these correlations.

## 2. Background

Within the NEA Global Forum on Nuclear Education, Science, Technology and Policy, Working Group 3 was created to identify common ground for conversations on the merits, limitations and challenges around nuclear technology between stakeholder groups. It pursues research and proposes recommendations targeting and enhancing intra- and inter-disciplinary awareness of three areas identified by the group to foster valuable discussion: values, socio-environmental impacts and nuclear futures.

The working group is:

- examining the values of the nuclear community as compared to those of other stakeholder groups;
- finding ways to articulate and discuss nuclear technology's benefits and limitations;
- exploring the possible range of futures opened by nuclear technology.

The survey was conducted within the framework of the Values Task Group to compare people's values, socio-demographic characteristics and degree of connection with the nuclear sector with their outlook on risk and nuclear energy. It will hopefully help to determine or confirm what drives certain perceptions of risk and nuclear energy, allowing a better understanding of the differing conceptualisations of real and perceived drawbacks. This will make it possible to improve knowledge of various actors in the nuclear community, but also to better understand those who do not value the alleged benefits of nuclear energy, and for whom the drawbacks are real and unacceptable. A greater understanding of stakeholders' various perspectives will support the working group's mission to identify common ground among stakeholders on the benefits and burdens resulting from the development and use of nuclear technology.

### 3. Methodology

The study was launched on 21 November 2022. The survey is still it open to this day, in an effort to keep gathering data: <https://www.surveymonkey.com/r/2MFNYGL>.

The first data extraction was performed on 1 July 2023. At this date, 2 008 replies had been collected. This working paper is based on this data.

#### 3.1. Goal and limits of the study

The survey was conducted on the SurveyMonkey platform. The link to the questionnaire was disseminated through the NEA networks and the networks of NEA working group members. The goal was to disseminate the questionnaire as widely as possible in terms of nationality, gender, age, education level, occupation and connection to the nuclear field. It was however understood that given the utilised channels, the survey would mostly circulate within nuclear networks and the resulting sample would be significantly biased. It was therefore never intended to determine representative views of the public in different countries on the issues explored. Its purpose was to allow comparisons and correlation analyses between the responses of specific sub-samples of respondents, which can be identified by replies through several socio-demographic questions that were asked. For instance, the study makes it possible to compare the perception of nuclear energy of Japanese and French respondents, or of women and men, or of younger and older respondents. Depending on the size of the sub-samples considered, and given the bias of the overall sample, the results must be used with care, always keeping in mind the nature of the sample and the size of the sub-samples. The findings are not a definite proof of correlation but an indication that should invite further investigation.

For comparison purposes, the questions were not crafted specifically for this survey. They were pulled from previous studies, mostly the French IRSN Barometer<sup>1</sup> (IRSN, n.d.), the “Nuclear Power and the Public” study (Slovic et al. 2000), and the World Values Survey (WVS, n.d.).

As of 1 July 2023:

Number of replies: 2 666

Number of fully filled questionnaires: 2 008

Completion rate: 75%

Average time spent: 17 minutes 54 seconds (for a fully completed questionnaire)

Number of questions: 32

Number of questions including sub-questions: 82

### 4. General findings

The survey has received over 2 000 fully completed responses. This is sufficient to begin exploring correlations within those replies, with the appropriate care due to the nature of the sample and sub-samples utilised in identifying potential correlations. The findings

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<sup>1</sup> The *IRSN Barometer on the perception of risk and security by the French*, launched in 1990, has been conducted annually by the Institut de Radioprotection et de Sûreté Nucléaire among a sample of 1 000 persons representative of the French population (2 000 persons since the 2020 survey).

presented here are not definite proofs of correlations but should be seen as indications that invite further investigation.

#### 4.1. Main findings

- Risks in general are perceived as lower in this study in comparison with results from the IRSN Barometer (IRSN, n.d.).
- Nuclear risks are perceived as particularly low.
- Correlations can be seen between the gender of the respondents and their perception of risk in general as well as the specific risks around nuclear energy. The women who responded to the survey tend to perceive risks as higher than men. They are less willing to live next to undesirable facilities, with the notable exception of wind farms, and are less supportive of nuclear energy. They also deem environmental non-governmental organisations (NGOs) and science journalists more competent than men do.
- Correlations appear between age and the perception of most risks. Younger respondents tend to perceive risks as higher. It is particularly the case for heat waves and traffic accidents.
- A correlation appears between perceived risk and political leanings. Those identifying themselves on the political right tend to see risks as lower than those who identify on the political left. This tendency is noted in all risk areas with the notable exception of risks from drugs.
- The survey also shows that on the left of the political spectrum support for nuclear energy is driven more by its environmental credentials, whereas on the political right energy independence is the predominant positive feature.
- Those on the political left declared a stronger trust level in scientific institutions.
- Levels of trust in several bodies were also found to be significantly impacted by political views – with levels of trust among the left-leaning respondents being higher by a factor of two or three than those from the political right regarding non-governmental organisations, science journalists or labour unions.
- Differences are noted in replies between countries, not only regarding main preoccupations but also the perception of nuclear risk, opinions on nuclear energy and attitudes towards different types of industrial facilities.

The next step will be to delve more deeply into the survey findings to further explore correlations, understand these correlations in detail and to identify where additional research is needed. It is hoped that the insights gained here will allow the nuclear sector and those connected to it to frame their future engagement and communications activities more effectively.

#### 4.2. The survey sample: who replied?

As explained above, the sample of survey respondents is not representative of the population of the participating countries. Due to the dissemination method, which made extensive use of social media and the personal networks of colleagues, and to the fact that the questionnaire was in English, the results show an overrepresentation of certain types of respondents. This was particularly relevant for non-English speaking countries, where the

language of the survey led to an over-representation of younger groups and/or the most highly educated. The most overrepresented categories overall are men, highly educated individuals, people working as professionals or managers, and individuals working or having worked in the nuclear sector. Some countries are also much more represented than others due to the better dissemination effectiveness of some networks (Japan, France and Belgium, for instance) and to the fact that the questionnaire was in English (United Kingdom [UK], Canada, United States [US] in particular).

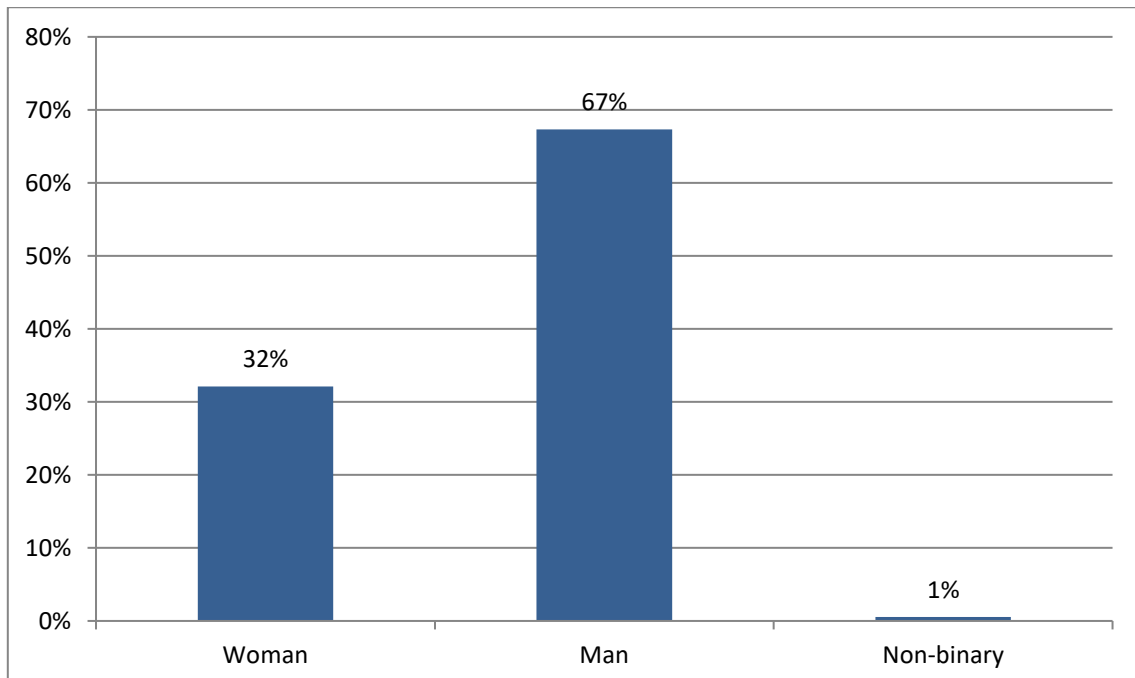
The structure of the sample of respondents is as follows.

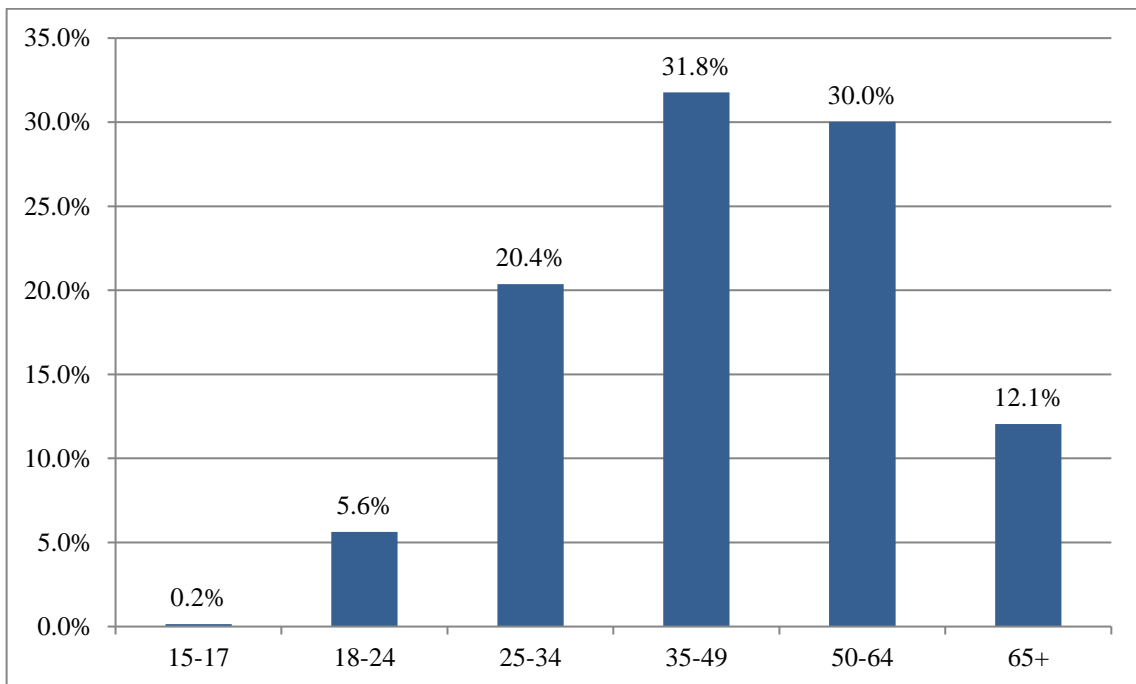
### 4.3. Gender and age

Regarding gender, 67% of the respondents were male, 32% female and 1% non-binary. This means men are significantly overrepresented among the respondents as compared to their percentage in the population of any of the represented countries, where the respective proportions are generally close to a 50-50 split, with some variations. In France, for instance, women accounted for 51.6% of the population in January 2019 (INSEE, 2019), while in the United States, they accounted for 50.4% of the population in July 2022 (CENSUS, 2022).

In terms of age, the demographic structure varies widely between countries. In Japan, for instance, the population aged 65 and older accounted for 29.5% of the population in November 2022 (SBJ, 2022), while it represented 18.8% in Canada in July 2022 (Statistics Canada, 2022). Among the survey respondents, the most numerous are the 35-49 year-olds, who account for 31.8% of the respondents, followed by the 50-64 year-olds with 30% and by the 25-34 year-olds, who represent 20.4% of the respondents.

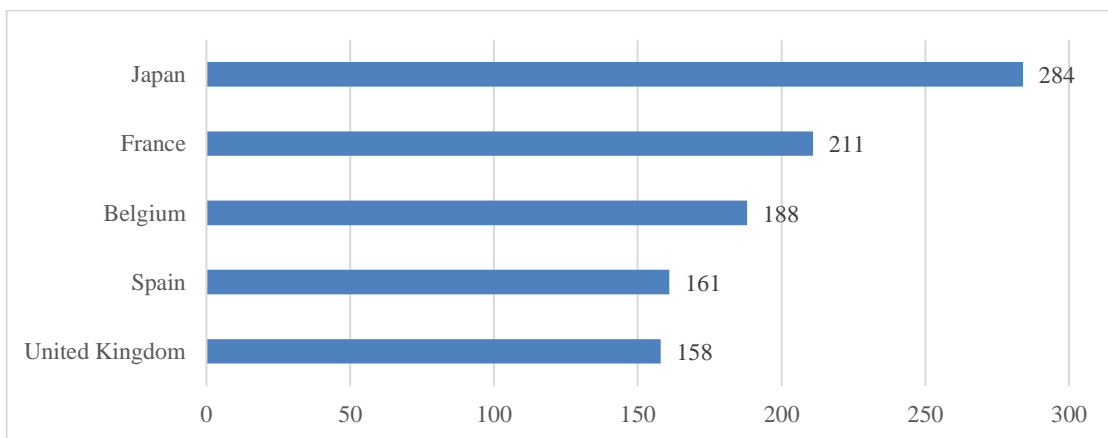
**Figure 4.1. What is your gender identity?**



**Figure 4.2. What is your current age?**

#### 4.4. Home country

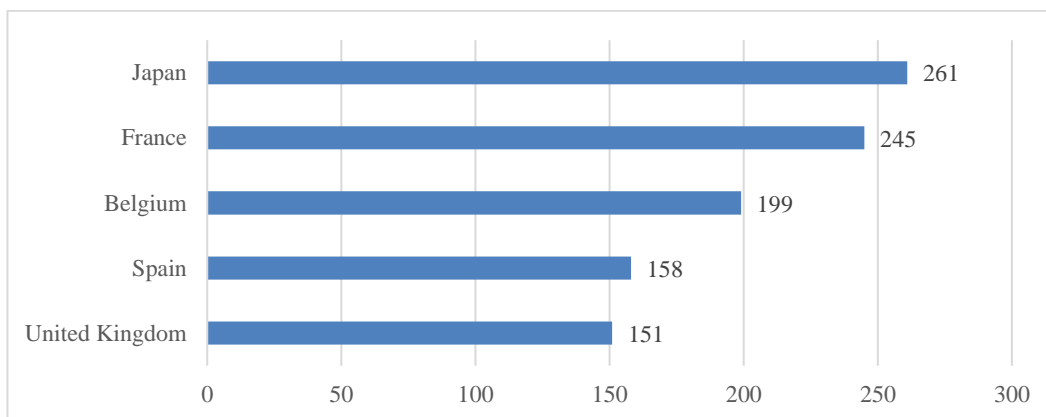
When taking into account the home country, described in the survey as the country “where you grew up”, replies were collected from 80 countries. While the top six countries account for more than half of the replies, 36 countries totalled only one or two replies. Two countries gathered a particularly high number of respondents: Japan, with 284 replies (14% of the total) and France, with 211 replies (11% of the total). Six countries gathered fewer than 200 but more than 100 replies: Belgium, Spain, the United Kingdom, the United States, Canada and Germany, in that order, and a total of 25 countries gathered more than 10 replies.

**Figure 4.3. Top five repliers by home country (by number of replies)**

#### 4.5. Country of residence

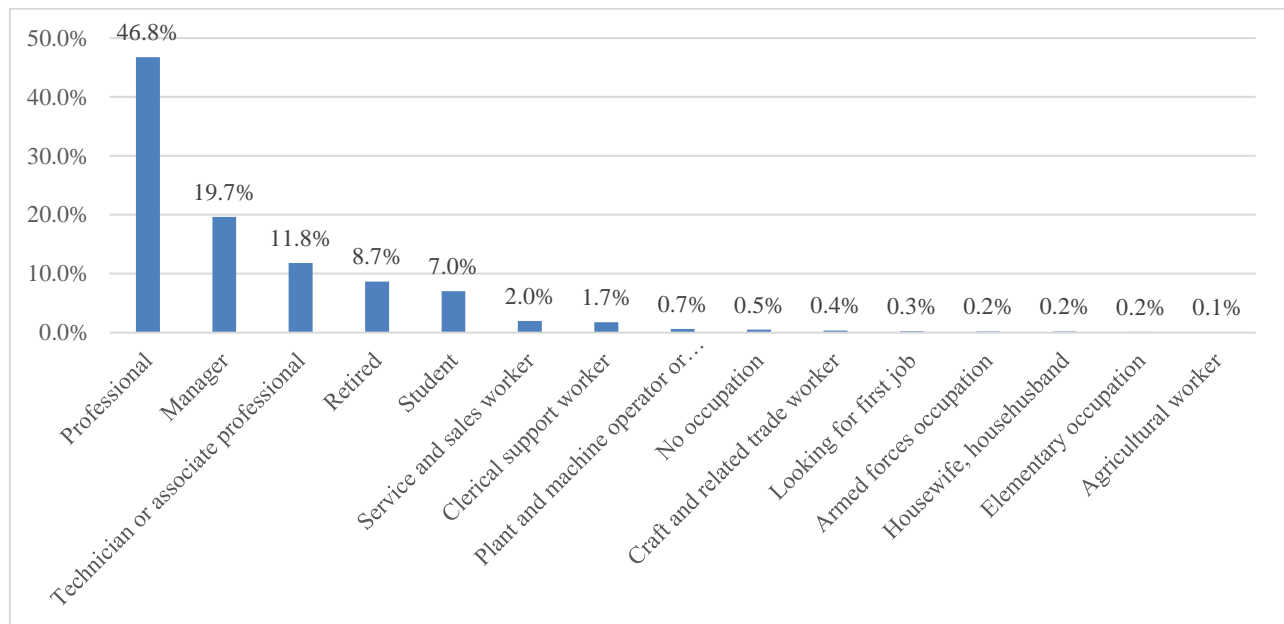
When taking into account the country of residence, described in the survey as the country where “you currently live”, instead of home country, replies were collected from a smaller number of countries: 65. This means that a significant number of respondents do not live in the country where they grew up. The biggest movements are seen in four countries: Japan (-23 between country of origin replies and country of residence), France (+34), Canada (+12) and Belgium (+11). Overall, the same countries still account for the biggest number of replies as when considering the home country, namely Japan, France, Belgium, Spain and the United Kingdom. Japan and France remain above 200 replies, with a lesser difference: 261 for Japan (13%) and 245 for France (12%). There are still six other countries above 100 replies: Belgium, Spain, the United Kingdom, Canada, the United States and Germany, in that order, with 27 countries totalling 10 replies or more.

**Figure 4.4. Top five repliers by country of residence (by number of replies)**



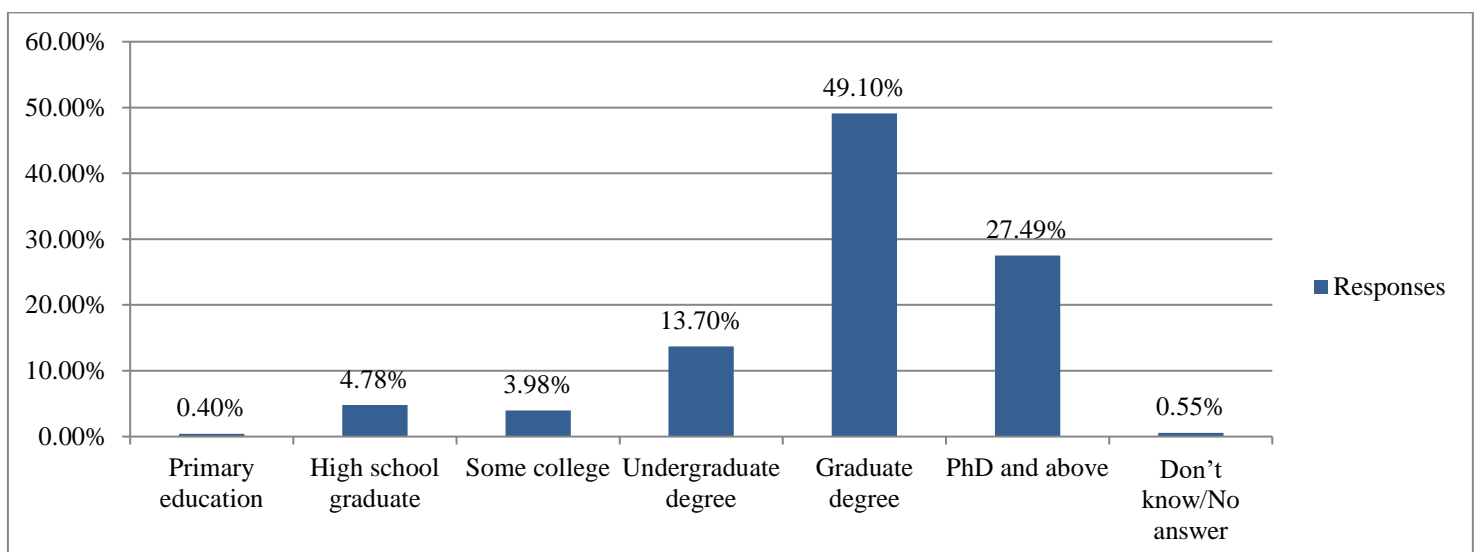
#### 4.6. Occupation

In terms of occupation, professionals and managers are significantly overrepresented compared to lower-level workers, as the first account for 46.8% of respondents and the second for 19.7%, compared to 11.8% for technicians. While their share of the population varies between countries, they never represent such a big share. In Belgium, for instance, managers accounted for 7.7% of the workforce in 2022 and professionals for 26.6% (STATBEL, 2023). On the contrary, service and sales workers, who represented 13.2% of the Belgian workforce in 2022 only account for 2% of survey respondents.

**Figure 4.5. What is your current occupation?**

#### 4.7. Education

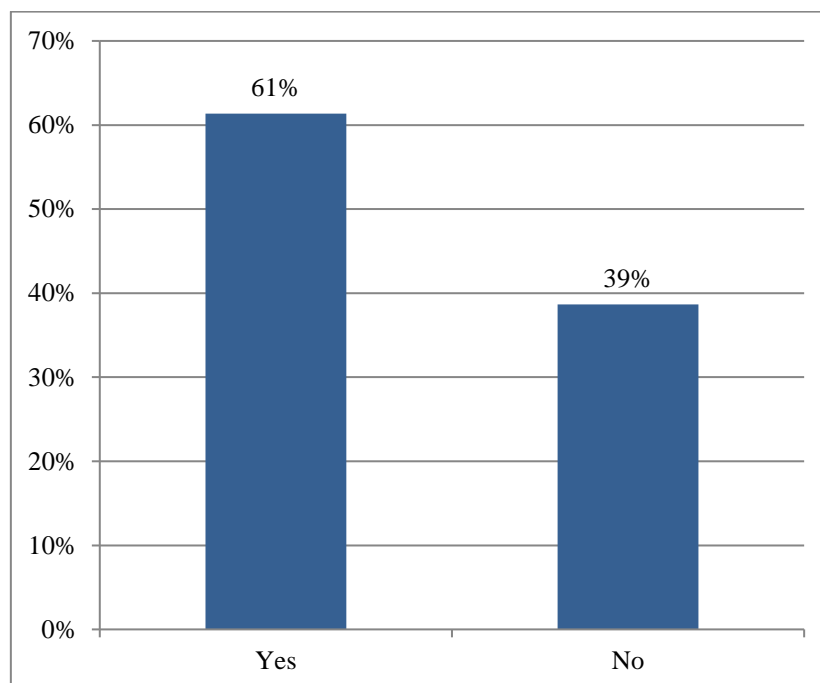
The level of education is one of the most significant biases within the survey's sample of respondents. Individuals whose highest degree is a graduate degree account for 49% of replies and people with a PhD represent 27.5%, which brings the total of respondents with tertiary education to 76.6% of the whole sample. As a comparison, the OECD country with the highest percentage of the population with tertiary education, which is Korea, had 69.3% of the 25-34 year-olds with such an education level (but only 25.9% among the 55-64 year-olds) in 2021, the average in OECD countries being 47.5% (for the 25-34 year-olds) (OECD, 2023, 2022).

**Figure 4.6. What is the highest degree you have obtained?**

#### 4.8. Experience in the nuclear sector

A question was included in the survey to assess the proximity of respondents with the nuclear sector in order to determine whether having experience in the nuclear field induced correlations with replies to some of the questions, such as the perceived level of risk attributed to nuclear power plants and radioactive waste, the opinion regarding nuclear energy, or the willingness to live in the vicinity of certain types of industrial facilities. The question was also designed to help spot possible bias in the replies due to the proximity of respondents to the nuclear sector. The results show that a large majority of respondents (61%) currently work or previously worked in the nuclear field. These results do not mean that the remaining 39% have no proximity at all to the nuclear field, as these respondents may have family members who work in the sector, or may be studying in that field without having worked in it yet.

**Figure 4.7. Do you currently work or have worked at some point in the nuclear sector?**

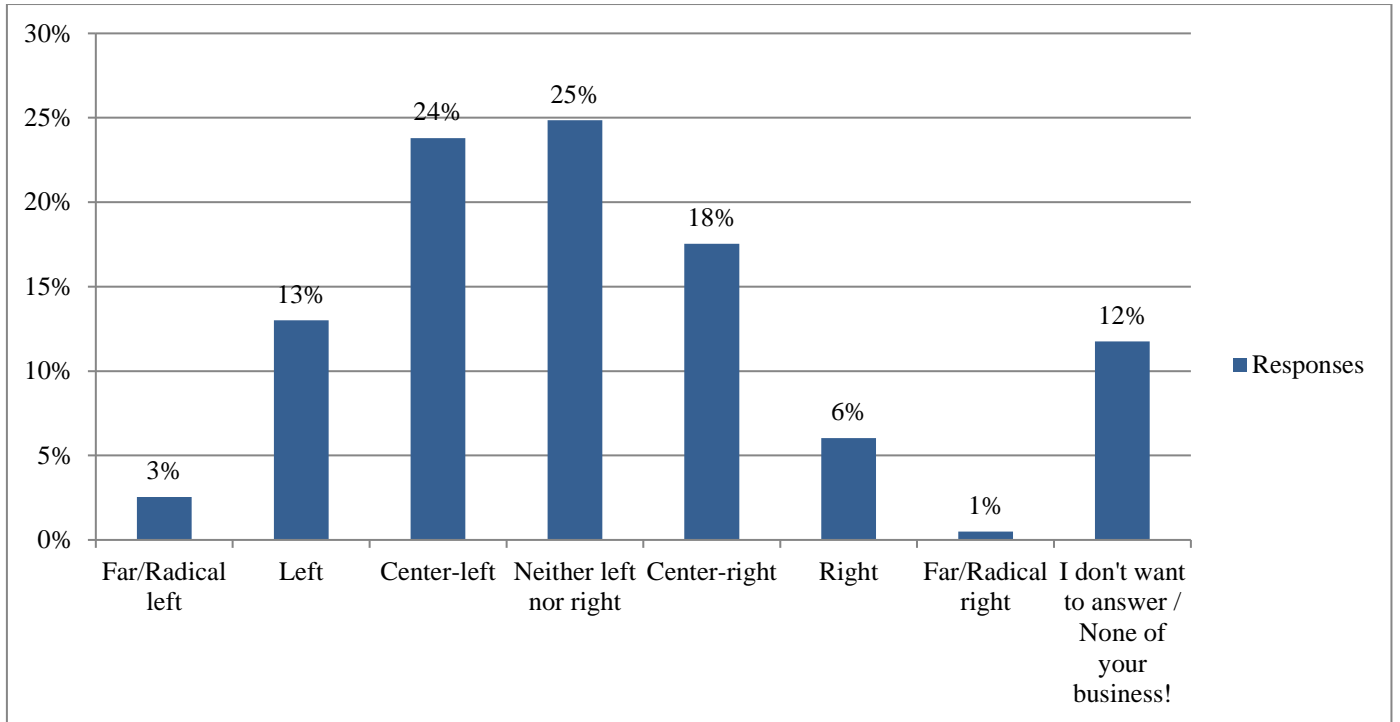


#### 4.9. Political leanings

The survey also included a question regarding the political leanings of respondents in order to analyse correlations between political positions and risk perception, attitudes towards science and nuclear energy. A little over 10% of respondents refused to indicate their political views, which was a possibility offered to them. Among respondents who replied, 1% (10 persons) positioned themselves on the far right and 3% (51 participants) on the far left. They will not be included in the subsample analyses presented in this document as their numbers are too small to be reliable. Individuals who positioned themselves as “neither left nor right” represent a sizeable part of respondents (25%, 499 persons) but will also mostly be set aside in this preliminary analysis as they do not constitute a homogeneous group: some view themselves as centrists, between left and right, while

others see themselves as detached from anything political, and the core values of these persons are very different.

**Figure 4.8. Can you tell us where you stand politically?**



## 5. Main results: an overview

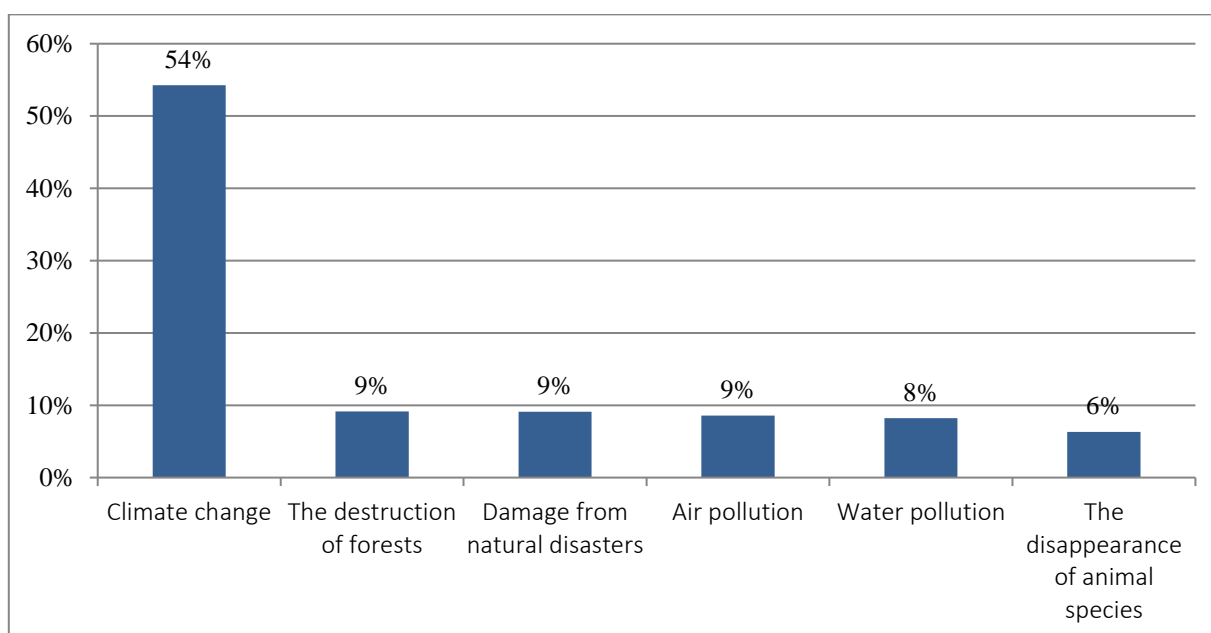
### 5.1. The main concern: cost of living

The four main concerns for the respondents regarding their home country were cost of living (23%), climate change (19%), social inequality (15%) and global geopolitical instability (14%), followed by a variety of other concerns such as, democracy, job security and unemployment. Health, poverty, crime and terrorism gathered the smallest number of replies. This ranking overlooks a wide disparity in replies between countries. In Japan, for instance, global geopolitical instability (27%) came in first, slightly ahead of cost of living (26%). Meanwhile, the French and German respondents widely placed climate change in front (36% and 35%), social inequality coming in second (21% in both countries). In Canada, Spain and Belgium, cost of living gathered the most replies with respectively 36%, 31% and 26%. In the United Kingdom, social inequality came out first (28%) ahead of climate change (22%), while in the United States, democracy was the primary concern (27%), ahead of cost of living (19%).

### 5.2. Climate change as main environmental concern

Among environmental issues, climate change drew the most attention, collecting more than half of the responses (54%). Then came the destruction of forests, damage from natural disasters and air pollution, all three with 9%. All countries with more than 100 replies showed a strong domination of climate change in the responses, with scores reaching 69% in Canada, 67% in the United Kingdom, 64% in Germany and 57% in France. In Japan, however, climate change registered almost the same score (40%) as damage from natural disasters (38%), most likely due to the frequency and impact of such disasters.

**Figure 5.1. Here are a number of environmental issues. Which one do you find most concerning? (only one reply possible)**



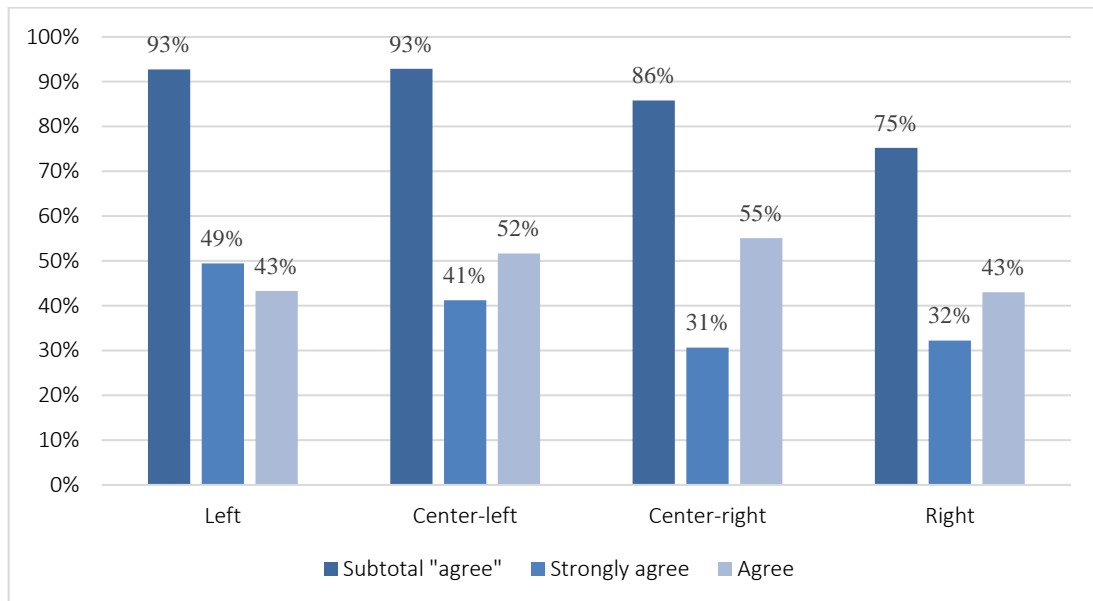
### 5.3. A robust trust in science and technology, tempered by a will to protect the environment

The respondents showed high levels of trust in scientific institutions (86%), associated with an overall positive view of technology. Indeed, 82% agreed with the statement “the development of science and technology generates more benefits than negative effects” and on the contrary only 32% agreed with the sentence “technological development is destroying nature”. The replies to that last question varied across the age spectrum, with higher numbers agreeing among the younger generations. The 18-24 year-olds were 49% to agree against 34% among the 35-49 year-olds and 26% of people age 65 and over.

Science is also viewed as a building block of sound policy, which should be grounded in facts and knowledge and should take precedence over public opinion, as 85% of the respondents declared they disagreed with the statement “the beliefs of the majority should prevail over science to set policy”, with slightly higher numbers among women (89%) than men (83%) and among younger than older respondents: 89% among the 18-24 year-olds and 87% among the 35-49 year-olds, against 80% among the people over 65. In the same spirit, 78% of the respondents agreed that “policy makers don’t take enough account of the positions of scientific experts”. The respondents also showed a high level of concern for the environment, stating that economic growth should not come before environmental protection. A wide majority (79%) agreed that “protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs”.

The typology of replies varied across the political spectrum. Respondents who position themselves on the left declared a stronger trust level in scientific institutions: to the statement “I trust scientific institutions”, 49% strongly agreed and 43% agreed, compared to respectively 32% and 43% among those positioning themselves on the right (centre-left respondents replied 41% and 52% while centre-right respondents replied 31% and 55%). Left-wing respondents showed at the same time a more nuanced stance towards for technology than right-wing respondents. While strong majorities among all declared that “the development of science and technology generates more benefits than negative effects”, respondents from the left agreed at 76%, compared to 84% among the centre-left, 88% among the centre-right and 90% within the right. And while 36% among the left “strongly agreed”, they were 48% on the centre-left, 51% among the centre-right and 63% among the right.

**Figure 5.2. "I trust scientific institutions": Agreement levels depending on political leanings**

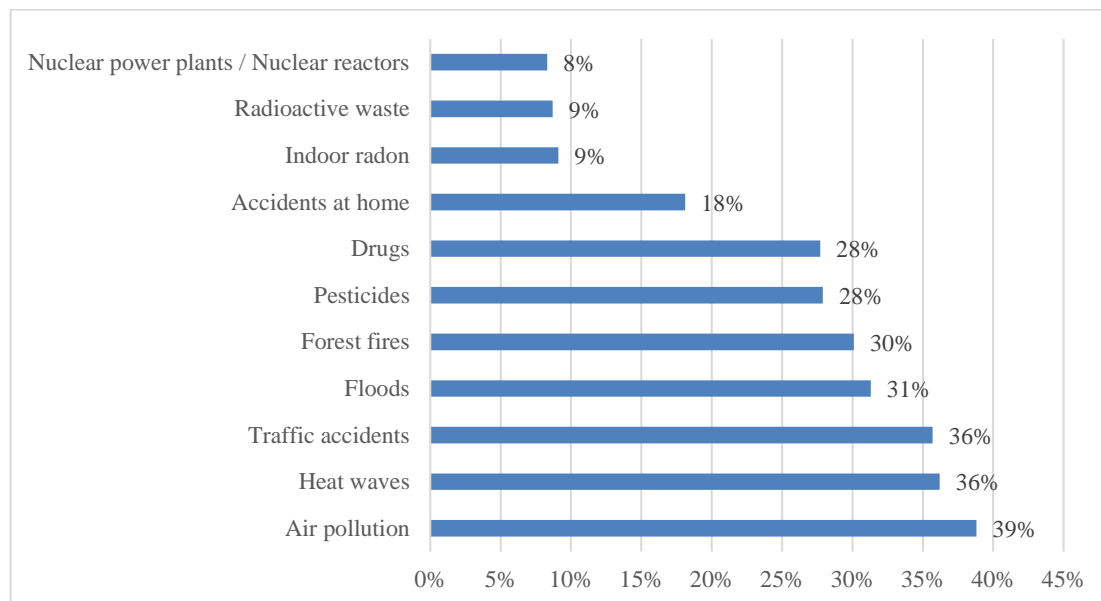


#### 5.4. All risks perceived as relatively low by the NEA sample, nuclear risks in particular

The respondents were presented with 11 “risk situations” of different types, going from nuclear power plants to drugs, pesticides and traffic accidents. These risks were selected among those proposed in the IRSN Barometer (IRSN, n.d.) to allow comparison. They were selected to represent a variety of risks: industrial, environmental, allowing or not individual protection measures, etc. Respondents were asked for each of these situations separately which level of risk they associated to it, from very low to very high.

Overall, the risk perceived as highest was for air pollution (39% of “high” or “very high” risk level replies), ahead of heat waves (36%) and traffic accidents (36%). Then came floods (31%), forest fires (30%), pesticides (28%), drugs (28%), and accidents at home (18%). The three nuclear risks: indoor radon (9%), radioactive waste (9%) and nuclear power plants (8%) came in with the lowest levels of perceived risk. Nuclear power plants and radioactive waste also gathered the highest numbers of “very low” and “low” risk level, both with 80%, while all other risks together averaged 40%.

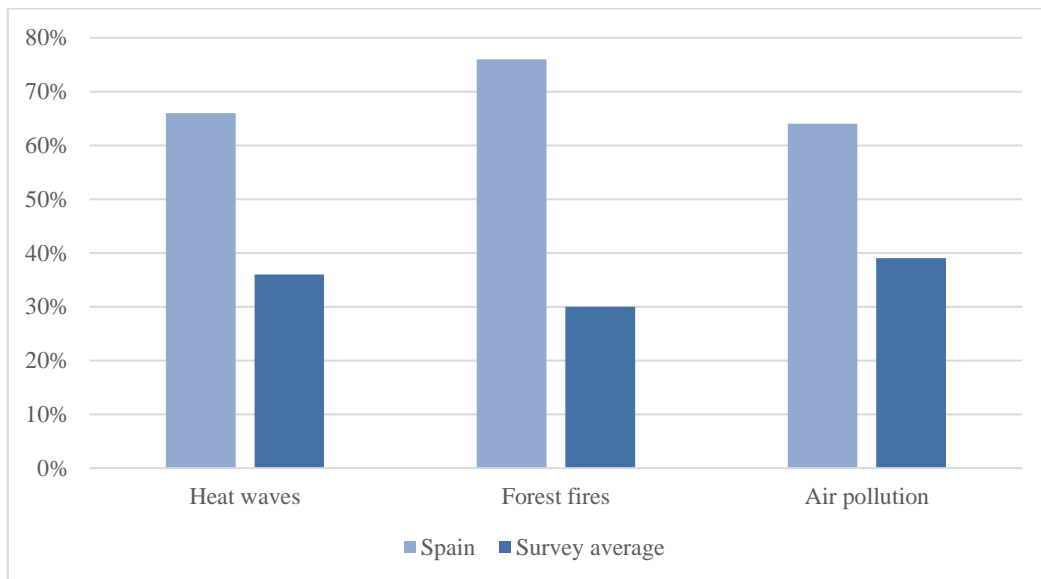
**Figure 5.3. Perceived level of risk for 11 risk situations. Total of "high" and "very high" replies**



Compared to the historical results of the IRSN Barometer, the results of the NEA study show lower levels of perceived risk for most items. It is also the case when comparing the results of the IRSN study to the replies given by the French respondents to the NEA study. For instance, the IRSN Barometer historical average for traffic accidents shows a risk level perceived as high or very high by 63% of the respondents (between 1997 and 2022), while this survey shows 36% and 31% for the French respondents. For pesticides, the IRSN Barometer averages 65% over the same period when this survey shows 28% and 57% for the French respondents – much higher than other countries but still lower than the IRSN results. Drugs average 65% in the IRSN study, against 28% in this survey and 27% for the French respondents. Further analysis will be required to determine the cause, which is probably due, beyond national differences, to the structure of the sample. A more detailed analysis of the results should allow to point to factors having the biggest impact on these variations in perception.

Spain stands apart from countries with more than 100 replies in terms of level of risk perceived. The Spanish respondents gave several items a significantly higher level of perceived risk for forest fires (76% of high or very high replies), heat waves (66%) and air pollution (64%). These results are also significantly higher than the average replies of all respondents to the studies, which are of 30% for forest fires, 36% for heat waves and 39% for air pollution.

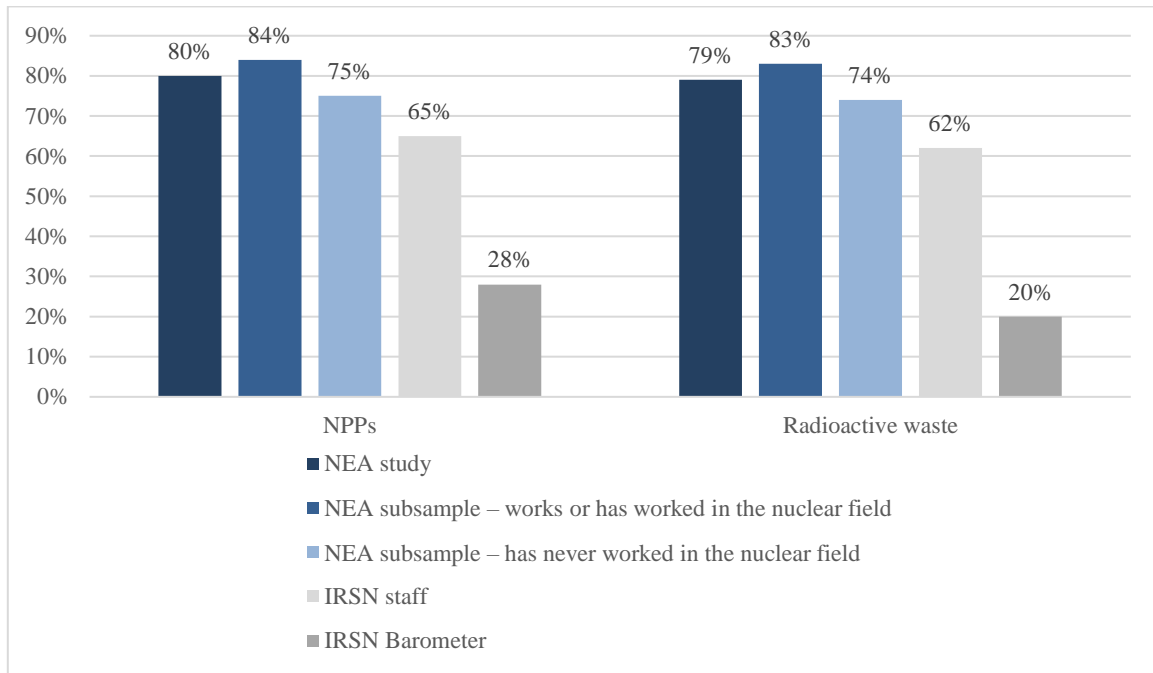
**Figure 5.4. Perceived risk levels for heat waves, forest fires and air pollution. Comparison between Spanish replies and average survey replies (subtotal of “high” and “very high” risk level replies).**



On the contrary, the level of risk perceived in Japan tends to be much lower than in other countries for several items. Air pollution only gathers 13% of “high” or “very high” risk level replies (compared to the 39% for all respondents). For pesticides, the total of “high” or “very high” risk level replies in Japan is only 7% (compared to 28%). For forest fires, the total is 4% (compared to 30%), for drugs, it is 8% (compared to 28%) and for accidents at home it is of 8% (compared to 18%).

Among all respondents, nuclear risks are perceived as particularly low. It was expected for respondents who work or have worked in the nuclear sector, but it is also the case here for respondents who declared they have never worked in the nuclear field. Within a subsample of such persons (approximately 780 respondents), 74% rated the level of risk associated with radioactive waste as very low or low and 75% regarding nuclear power plants. These numbers are approximately 10 points lower than the replies of persons having worked in the nuclear field, but were expected to be much lower based on existing literature. In November 2021, the IRSN survey was conducted simultaneously among the regular 2 000-person sample representative of the French population and among the IRSN staff (approximately a third of the 1 800 employees participated). The responses to the questions on nuclear risks were strikingly different between both samples. Within the French population, 20% rated the risk associated with radioactive waste as very low or low. Among IRSN staff, the total was 62%. Regarding nuclear power plants, the results were respectively 28% and 65%. The results obtained in the NEA study suggest that working or having worked in the nuclear field is not as much a determinant to the perception of nuclear risk as being familiar with such issues: the more a person is familiar with nuclear issues, the lower the level of risk perceived tends to be. As noted earlier, respondents to the NEA study who have not worked in the nuclear sector still cannot be viewed as a representative sample of the general public as they may often have relatives who do, or some other connection with nuclear.

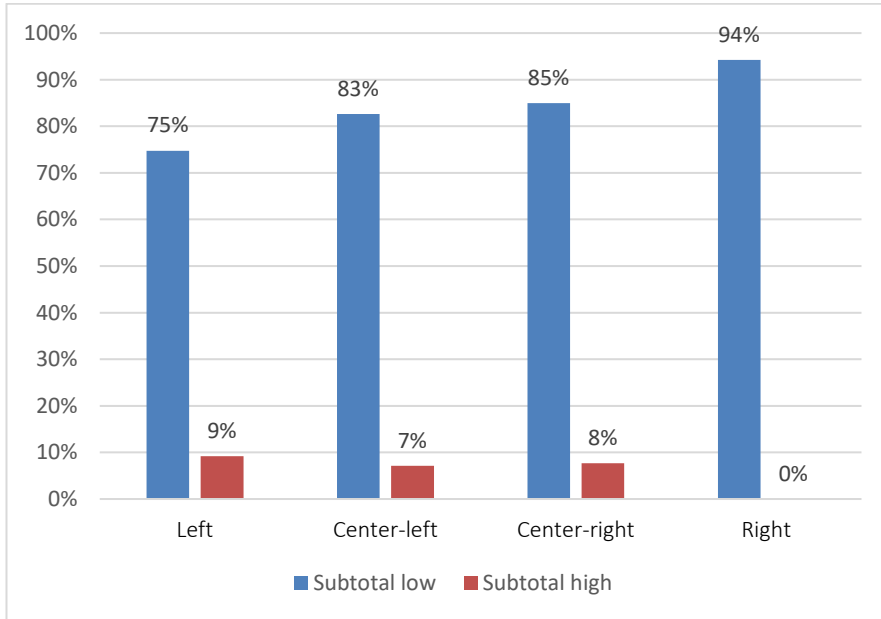
**Figure 5.5. Compared perception of the risk level associated with nuclear power plants and radioactive waste among five different samples (subtotal of “low” and “very low” risk level replies)**



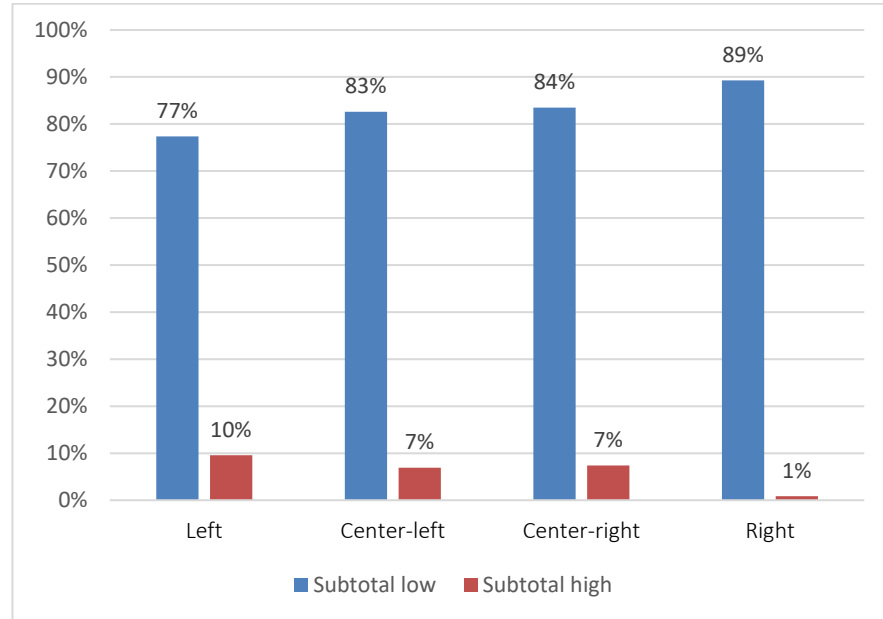
The NEA study also shows a significant difference in risk perceptions across the political spectrum. Out of the 11 situations assessed in the study, all but one (drugs) are perceived as carrying a higher risk level by left-wing people than they are by right-wing respondents. Radioactive waste and nuclear power plants are both seen as carrying low levels of risk across the whole spectrum and see the smallest differences between people from opposite sides of the political arena. Still, while 94% of right-wing respondents declare the risk of radioactive waste is very low or low, 70% of left-wing respondents declare so. Regarding nuclear power plants, the totals are respectively of 89% and 77%. Regarding air pollution, 50% on the left perceive the risk level as high or very high, to be compared with 21% on the right. Regarding pesticides, the results are respectively 42% and 19% and for heat waves 53% against 24%. The only exception is drugs. In that category, the risk is seen as high or very high by 28% of people on the left, which is aligned with perceptions on the centre-left (26%) and on the centre-right (26% as well), but not with the right, for which the score is 40%.

**Figure 5.6. Replies according to political leanings to the question: “In each of the following areas, do you consider that the risks for the population in your home country are...” (Subtotals of low and very low replies, and high and very high replies).**

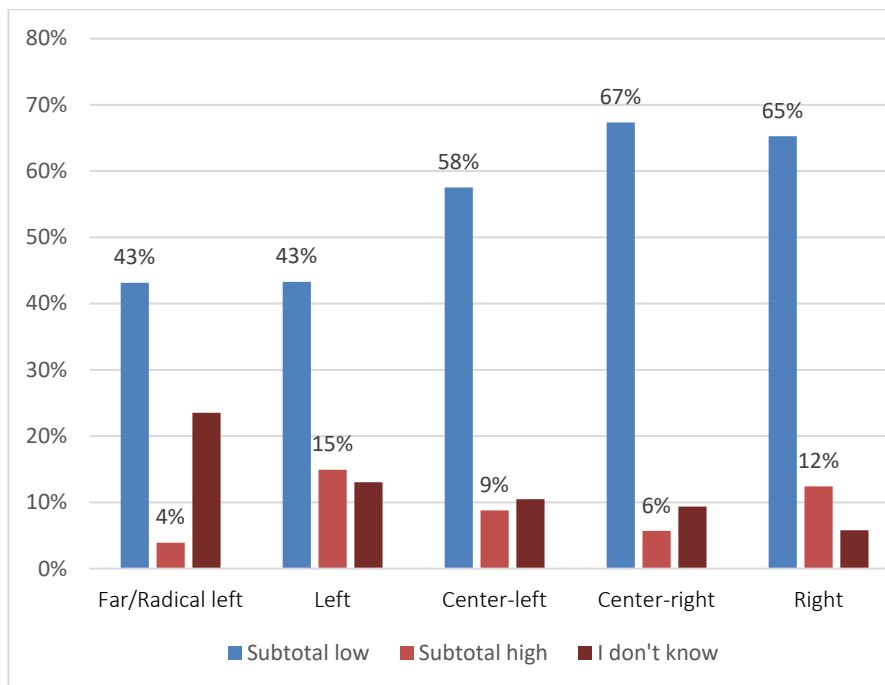
**A. Radioactive waste**



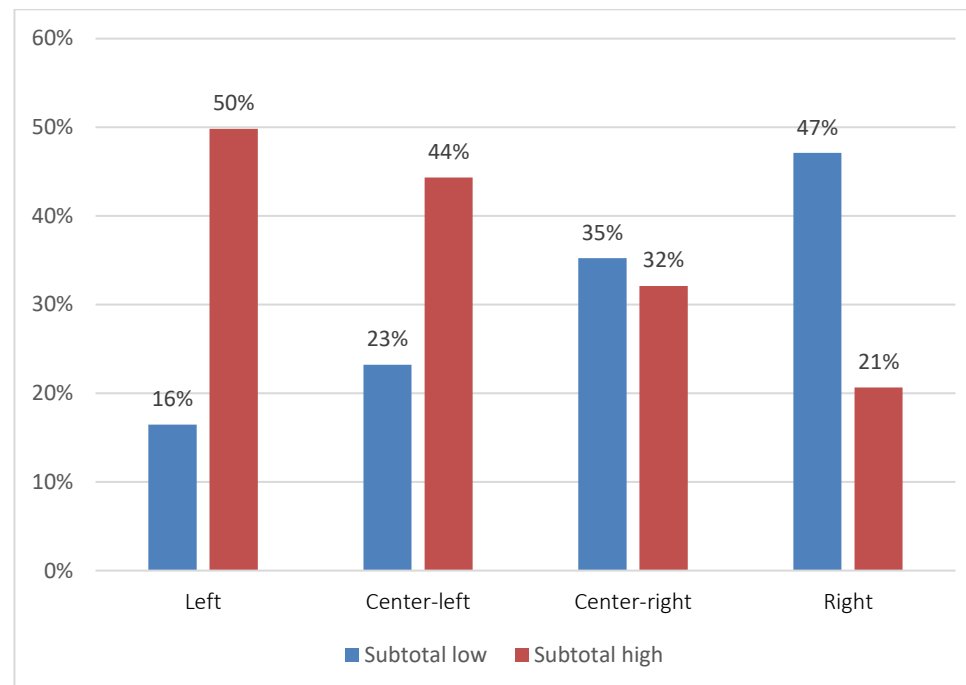
**B. Nuclear power plants**



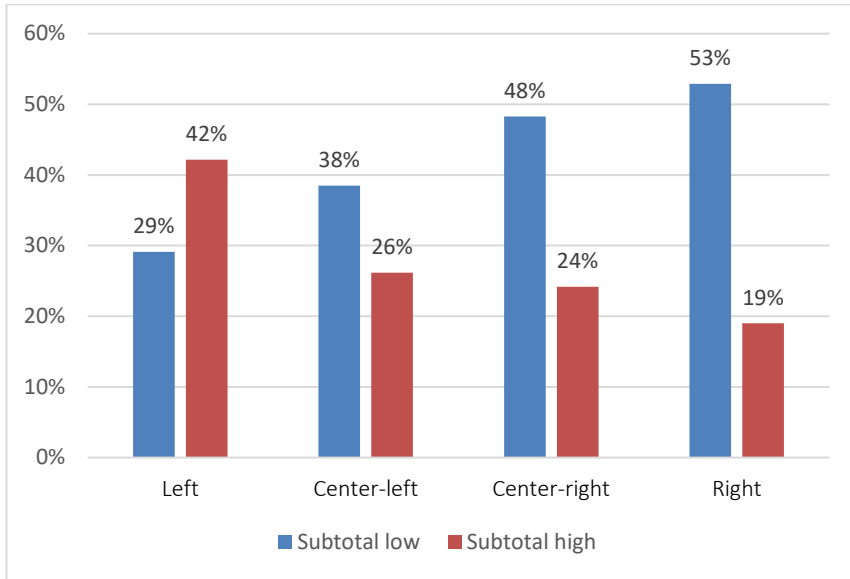
### C. Indoor Radon



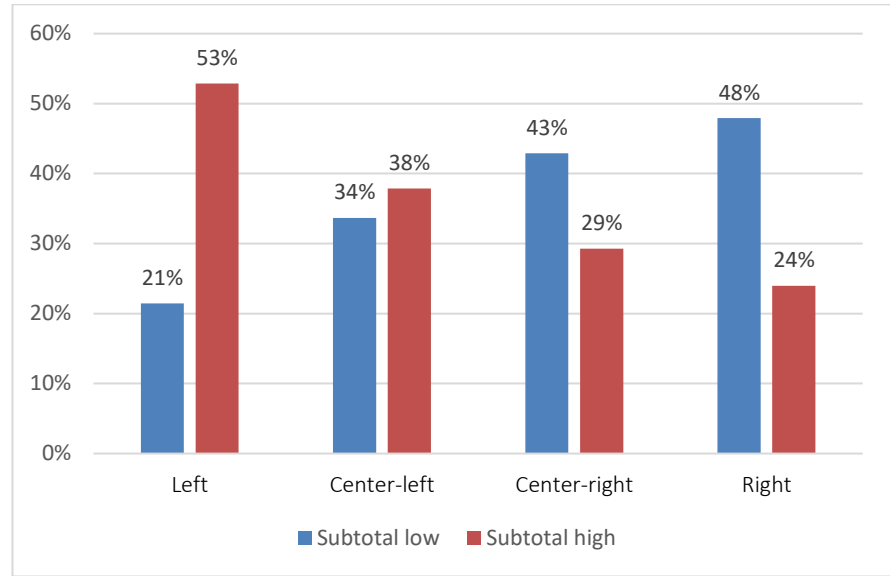
### D. Air pollution



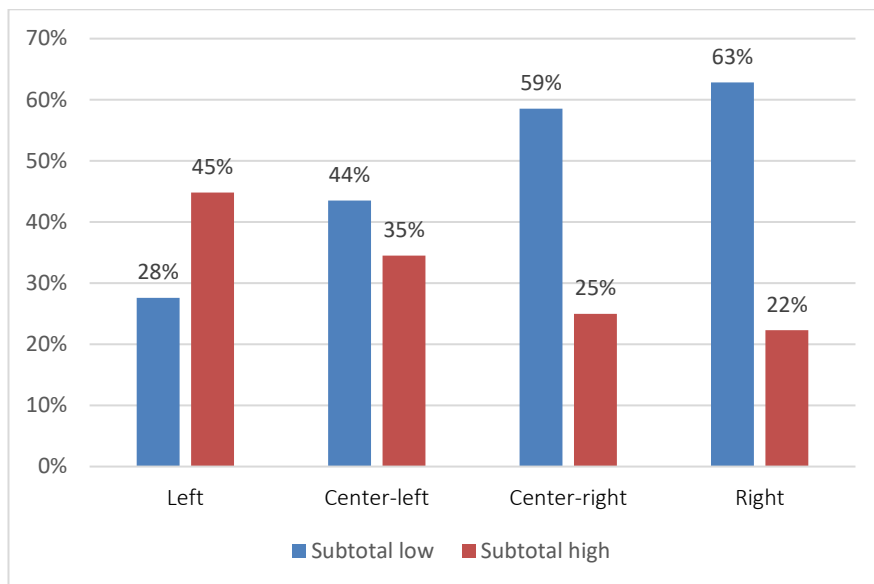
### E. Pesticides



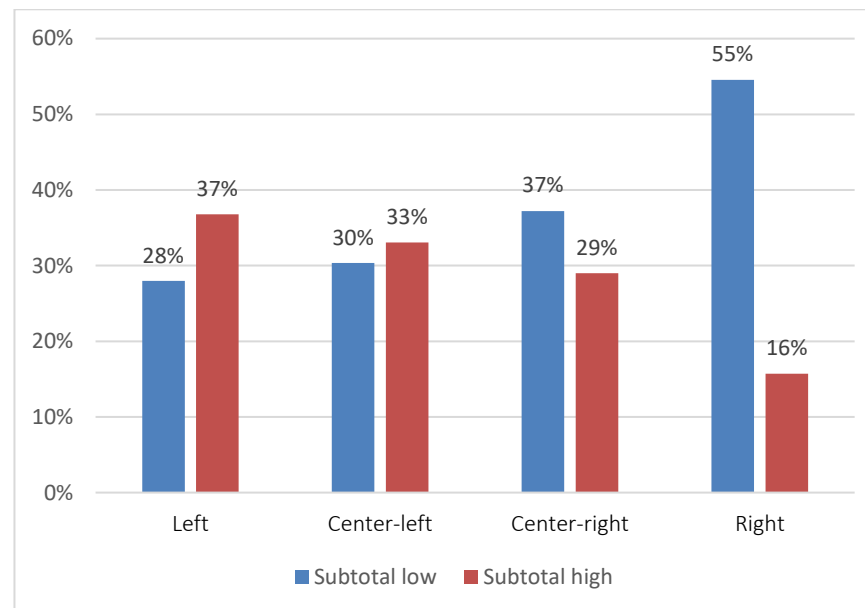
### F. Heat waves



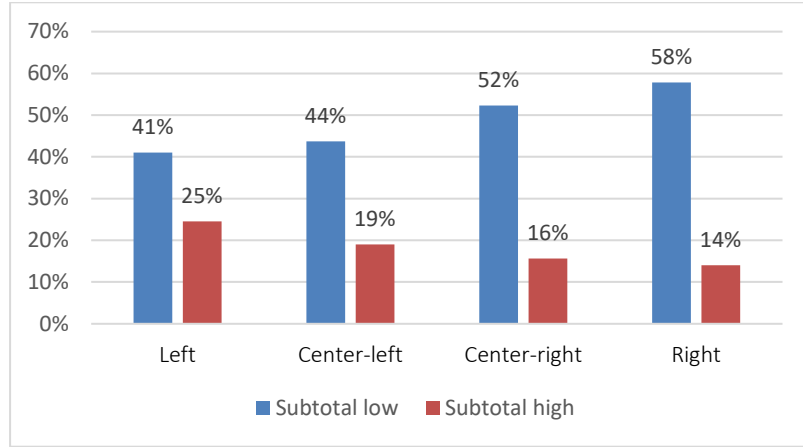
### G. Forest fires



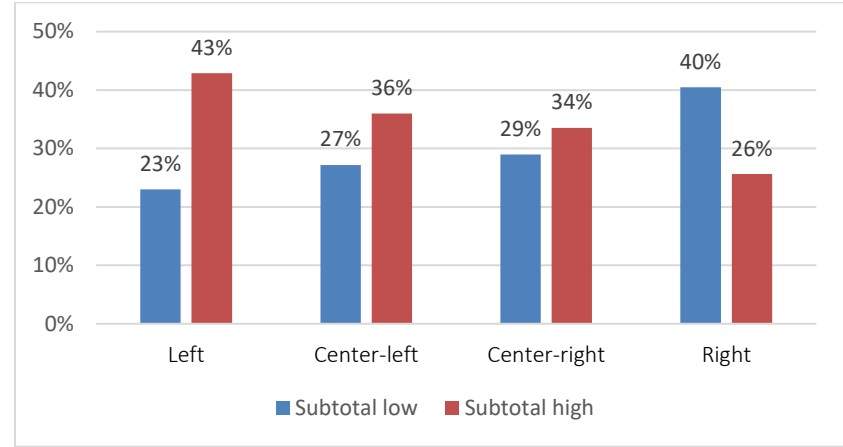
### H. Floods



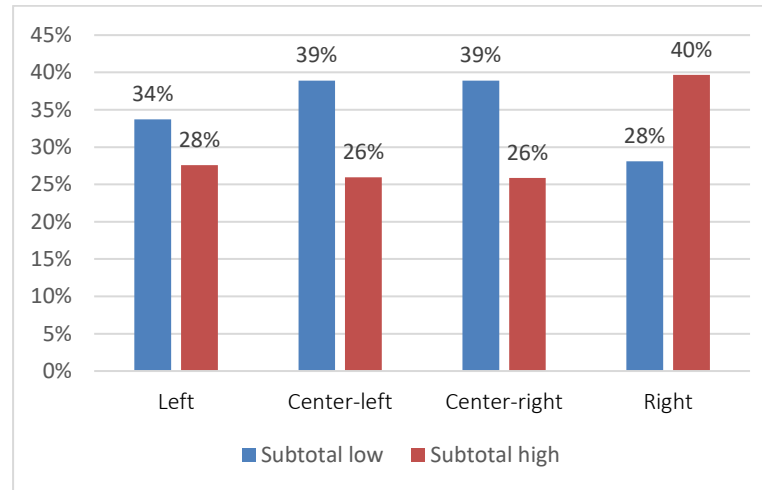
**I. Accidents at home**



**J. Traffic accidents**

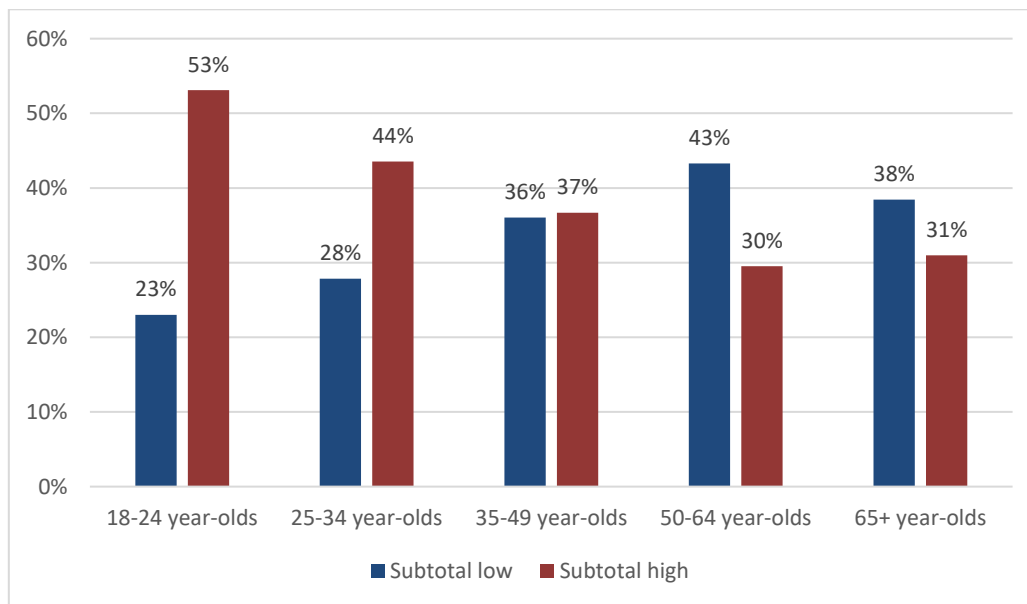


**K. Drugs**



Different perceptions were also found between age categories, with younger respondents viewing most risks as higher than older generations. For nuclear risks and for drugs, the differences are not significant, but for all others, they are. Air pollution was seen as carrying a high or very high risk level by 48% of the 18-24 year-olds and 25-34 year-olds, but only 32% of the 50-64 year-olds and 28% among those aged 65 and above. The difference is particularly strong for heat waves and traffic accidents. For heat waves, the risk is seen as high or very high by 53% of the 18-24 year-olds and 25-34 year-olds, but only 30% of the 50-64 year-olds and 31% among those aged 65 and above.

**Figure 5.7. Risk level associated with heat waves according to the age of the respondent**



## 5.5. Risks and precautions

Participants were asked several questions regarding risks and precautions that should be taken under different circumstances. To the general question asking whether “When it comes to risk, it is normal to take every precaution, even when scientists are not absolutely sure there is a risk”, a slight majority of 54% were in agreement, 25% did not take a stance and 21% disagreed. This result is significantly different from the IRSN Barometer 2023, where 79% of respondents agreed and 5% disagreed. In the NEA study, replies varied across the political spectrum. Left-wing respondents were more numerous to agree, with 58% (including 16% strongly), compared to 49% among the centre-left respondents, 54% among the centre-right and 41% within right-wing respondents (including 8% strongly).

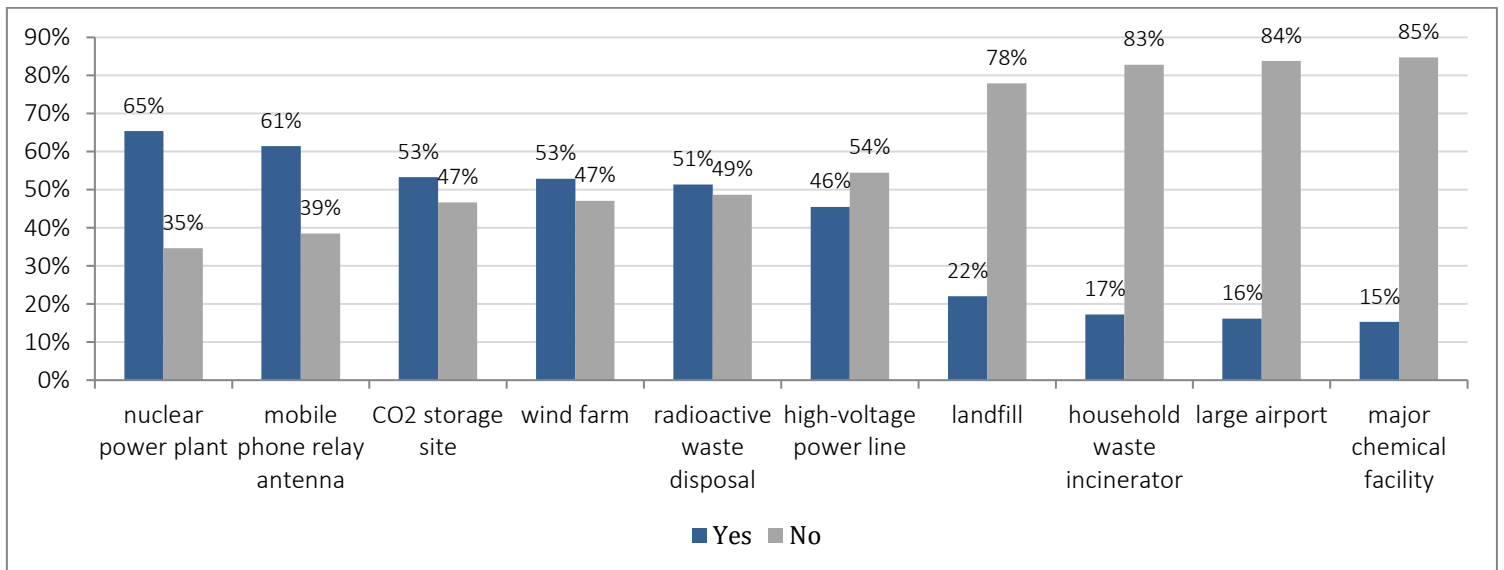
Asked more specifically if “Nuclear site operators must protect their facilities from all risks, even those considered very unlikely”, a much higher number (84%) was in agreement, which is the same result as in the IRSN Barometer (IRSN, n.d.). The agreement was stronger on the left of the political spectrum, with 90% agreeing, including 58% strongly, to be compared with respectively 84% and 41% on the right. The agreement is also stronger among women (90%, including 56% strongly) than men (82%, including 45% strongly). Younger respondents also agreed more strongly than older ones.

Questioned about their perception of the level of precaution in their country (“In my country, every precaution is being taken to ensure a very high level of safety in nuclear power plants (if applicable)”), 74% agreed and only 6% disagreed (12% replied their country does not have nuclear power plants).

### 5.6. To live or not to live... next to a nuclear power plant

When it comes to living location, respondents are more likely to be reluctant to live close to “a major chemical facility” (85% of refusal), “a large airport” (84%) or “a household waste incinerator” (83%). On the contrary, 65% declared they would be willing to live near a nuclear power plant, 61% near a mobile phone relay antenna, 53% near a CO<sub>2</sub> storage site and 51% near a radioactive waste disposal. These numbers are aligned with the historical tendencies from the IRSN Barometer, with the exception of nuclear facilities. In the 2023 IRSN Barometer, nuclear power plants and radioactive waste disposals face the same levels of rejection as airports and chemical facilities, collected respective rejection scores of 79%, 92%, 86% and 92%. It is not the case in this study, which shows lower levels of rejection for nuclear power plants (35%) and radioactive waste disposals (49%).

**Figure 5.8. Would you be willing to live near a...?**



The replies show significant differences between countries. Airports gather the largest consensus against them, being strongly rejected by all countries with more than 100 respondents, with scores going from 76% in the United States to 96% in France. Major chemical facilities, household waste incinerators and landfills also show high levels of rejections from all with a small difference in Germany, where they are slightly less rejected, with respectively 70%, 68% and 59% of people declaring they would not accept to live near such facilities.

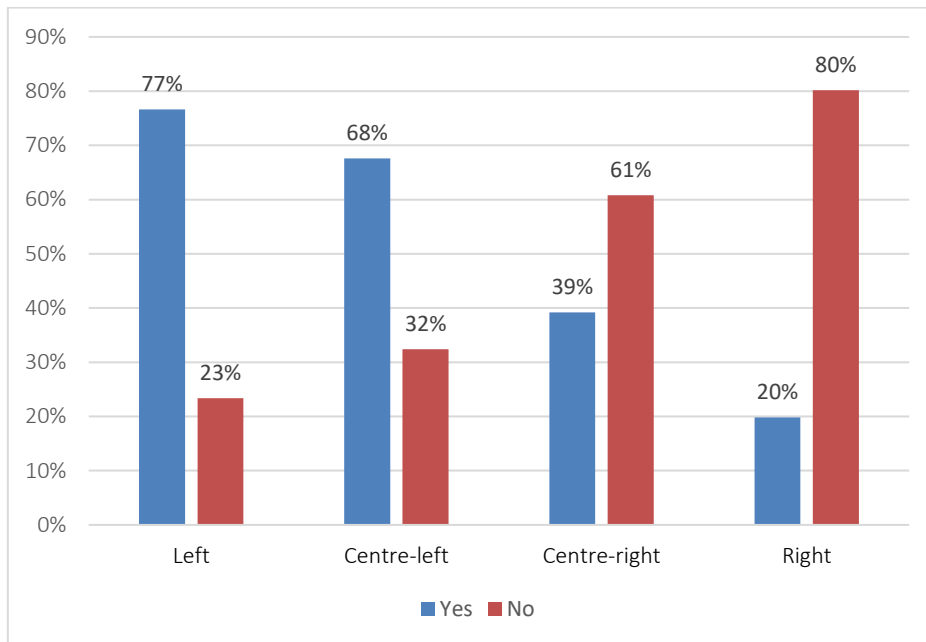
Mobile phone relay antennas benefit from the acceptance of a majority of respondents in the countries with more than 100 replies, but while acceptance is wide in Germany (81%), Canada (79%), the United States (79%) and the United Kingdom (72%), it is more limited in Belgium (56%), Japan (56%), France (53%) and Spain (50%). Nuclear power plants are

largely accepted, by up to 80% of respondents in the United Kingdom, with the exception of Japan, where 50% declare they would accept to live near one.

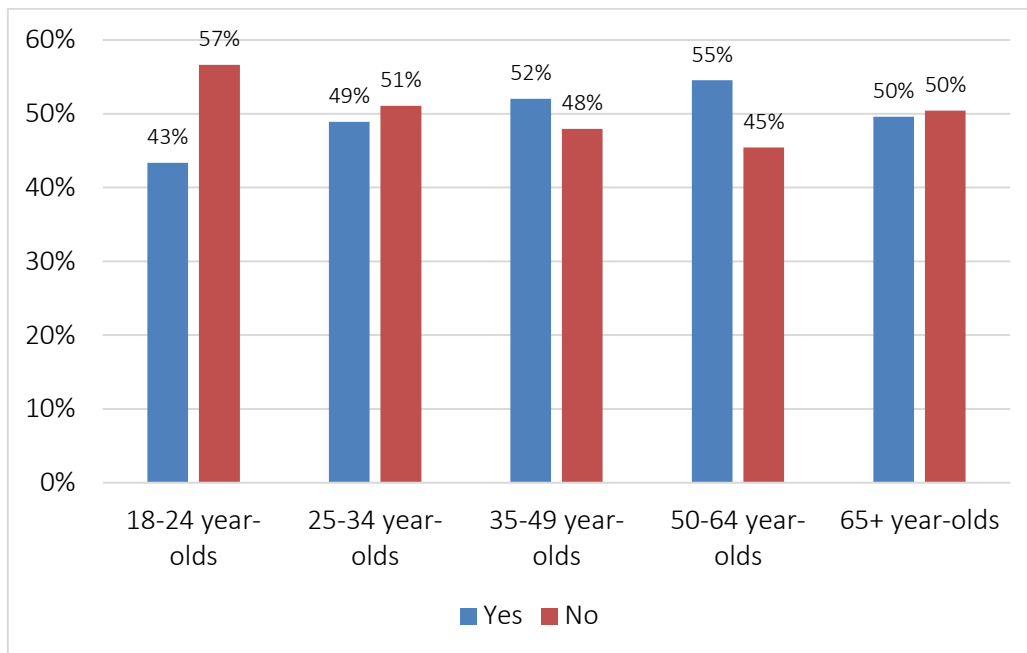
Positions on radioactive waste disposals, wind farms, power lines and CO<sub>2</sub> storage sites show stronger differences among countries. In Germany and in the United Kingdom, respectively 75% and 68% of respondents declared they would accept to live near a radioactive waste disposal. In Japan, on the contrary, 63% of the respondents declared they would not accept to live next to such a disposal. In Belgium and in the United States, opposition is respectively of 55% and 51%. Wind farms are mostly accepted, except in Japan, where they are strongly opposed, with 73% of respondents unwilling to live next to one, and in Belgium, where a slight majority (52%) is opposed. On the contrary, they are especially accepted in Germany (77%) and in the United States (72%). Power lines are mostly rejected in France and Japan (66% of opposition), Spain (65%) Belgium (61%). They are mostly accepted in Germany (74%), Canada and the United States (61%). CO<sub>2</sub> storage sites are strongly accepted in the United States (67%) and the United Kingdom (66%), accepted by a smaller majority (59%) in Canada, France and Germany, and are rejected by a majority in Spain (55%) and Japan (58%).

Positions also vary across the political spectrum, with some facilities being more accepted by left-wing people, others by right-wing persons, while positions of centre-left and centre-right people are often close to each other. The left is much more willing to live next to wind farms (77% against 20% for the right), more willing to live next to CO<sub>2</sub> storage sites (67% against 51%) and mobile relay antennas (67% to 58%), and a little more to high-voltage power lines (56% against 44% right, while centre-left and centre-right levels are at 51% and 49%). Right-wing people seem more willing to live next to nuclear power plants (71% to 58%, while centre-left and centre-right record 71% and 75%) and slightly more willing to live next to major chemical facilities (26% to 15%) and household waste incinerators (26% to 16%, with centre-left and centre-right gathering 18% and 17% of acceptance). Radioactive waste disposals are rejected by a majority on the left, with 52% refusing, while 58% on the right and the centre-left, and 59% on the centre-right declare they would be willing to live next to one. Airports and landfills are rejected by all.

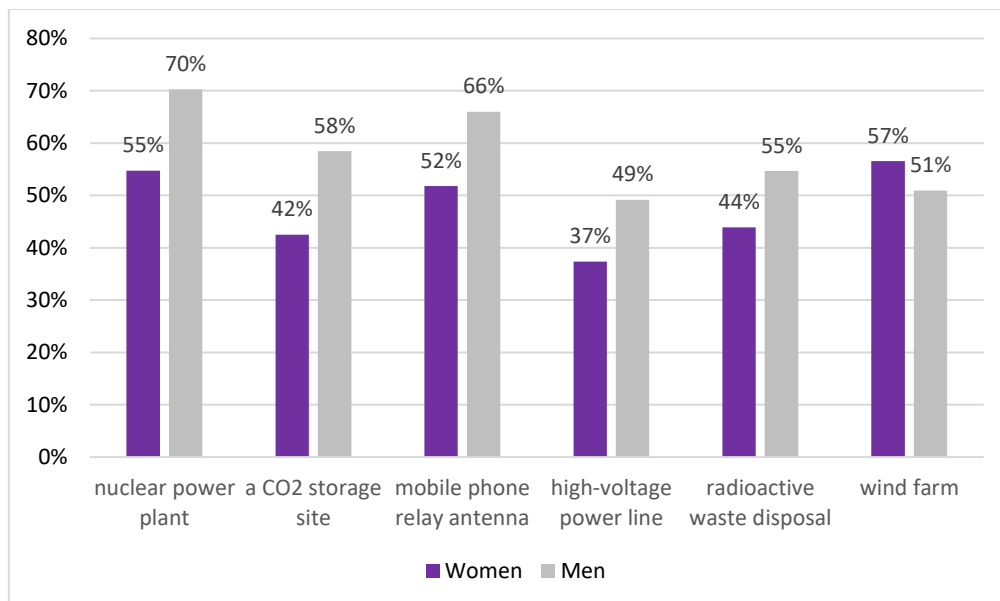
**Figure 5.9. Would you be willing to live near a wind farm? (replies according to political leanings)**



Replies are also different among age categories for some facilities. There is no significant difference for nuclear power plants, major chemical facilities, large airports, household waste incinerators and landfills. Wind farms, high-voltage power lines and CO<sub>2</sub> storage sites, however, are more accepted by the youngest. For wind farms, 68% of the 18-34 year-olds declare they would accept living next to one, while only 37% of those aged 65 and above declare so. For high-voltage power lines 59% among the 18-24 year-olds would accept against 38% among the 50-64 year-olds and 50% among those aged 65 and above. Regarding CO<sub>2</sub> storage sites 63% among the 18-24 year-olds declare they would accept, against 51% among the 50-64 year-olds and 59% among those aged 65 and above. Radioactive waste disposals, on the contrary, are slightly less accepted by the youngest, with 43% among the 18-24 year-olds against 55% among the 50-64 year-olds and 50% among those aged 65 and above.

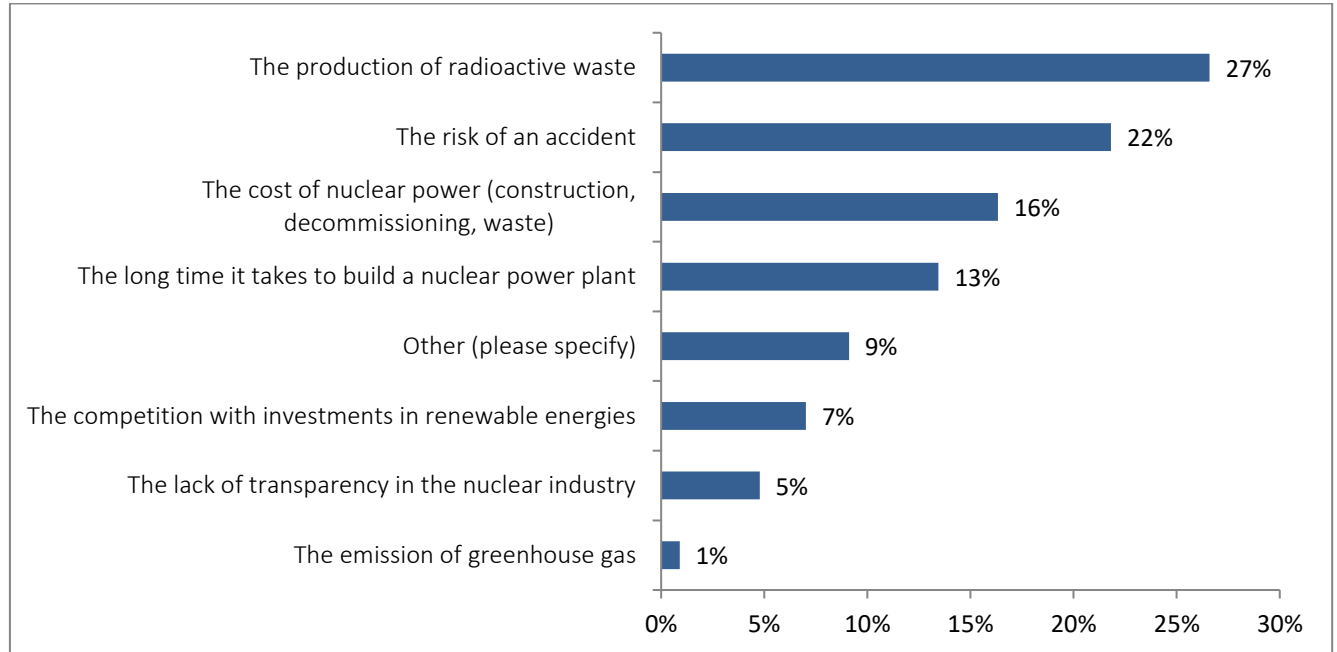
**Figure 5.10. Would you be willing to live near a radioactive waste disposal?**

Overall, female respondents are less willing to live next to the proposed sites. It is particularly the case for mobile relay antennas (52% against 66% among men), high-voltage power lines (37% against 49% among men), nuclear power plants (55% against 70% among men), CO<sub>2</sub> storage (43% against 58% among men) and radioactive waste disposals (44% against 55% among men). Wind farms are the only exception, being accepted by 57% of women against 51% of men.

**Figure 5.11. Would you be willing to live near a...?**

## 5.7. Strongest argument against nuclear power

**Figure 5.12. What do you think is the strongest argument against nuclear power today? (only one reply possible)**



The strongest argument against nuclear power is “the production of radioactive waste”, which gathers 27% of replies, ahead of “the risk of an accident” (22%) and “the cost of nuclear power (construction, decommissioning, waste)” (16%). Among the top responding countries, France, Belgium, Spain and Germany show a strong similarity in results, placing radioactive waste first and the risk of an accident second, with low variation in percentages. Results are significantly different in the United States, the United Kingdom, Canada and Japan. In the United States, the cost issue comes first with 33%, ahead of radioactive waste (21%). The risk of an accident is 6<sup>th</sup> with only 6% of the replies. In the United Kingdom, cost also comes first, with 28%, ahead of “the long time it takes to build a nuclear power plant” (23%). The risk of accident is 6<sup>th</sup> with 4% of replies. In Canada, the production of radioactive waste is viewed as the strongest argument against nuclear power (31%), but the second is the cost (23%). The risk of an accident collects 11% of replies, in 5<sup>th</sup> position. Finally, Japan places the risk of an accident as a very strong first argument against nuclear power, with 51% of replies. The production of radioactive waste is second with 17%.

Across all age categories, the production of radioactive waste is the argument gathering the most replies, the highest being 29% among the 50-64 year-olds. The risk of an accident is second among all age brackets except for the 18-24 year-olds, who place second “the long time it takes to build a nuclear power plant” with 21% (the production of radioactive waste gathers 24%).

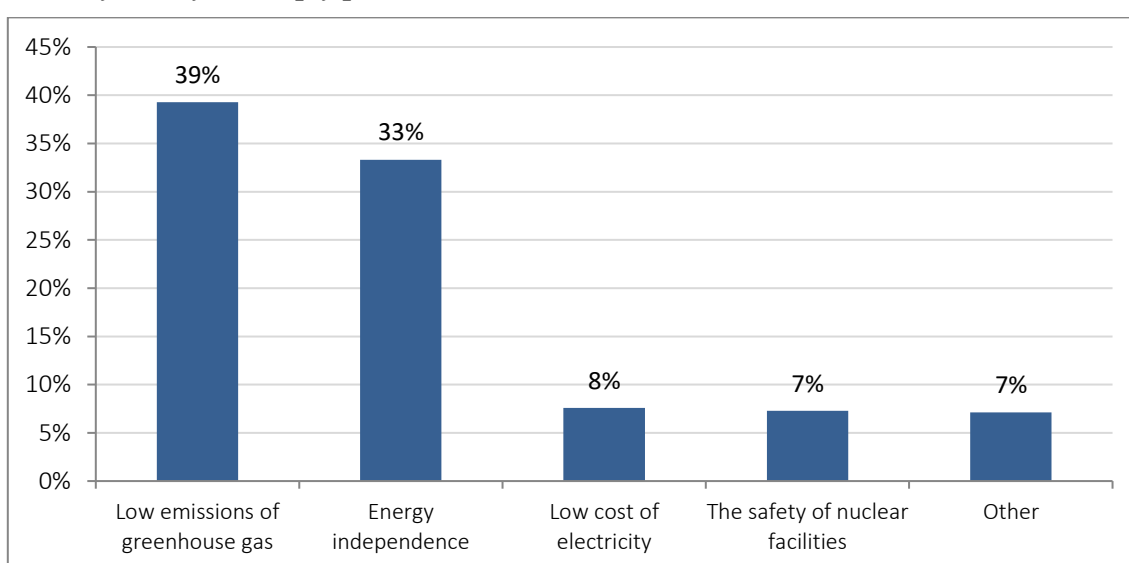
Across the political spectrum, the production of radioactive waste also is the argument gathering the most replies except for right-wing respondents, who place “the long time it takes to build a nuclear power plant” (25%) slightly ahead of the production of radioactive waste (24%) and the risk of an accident (21%). Among left-wing respondents, the cost of nuclear power comes second with 21%.

Women and men rate arguments in the same order, but with different scores. Women place the production of radioactive waste strongly ahead with 34% (against 23% among men), then comes the risk of an accident (22%, same among men), and the cost of nuclear power (14%, against 18% among men).

### 5.8. Strongest argument for nuclear power

The two strongest arguments in favour of nuclear energy, far ahead the others, are the “low emissions of greenhouse gas (GHG)” (39%) and energy independence (33%). Then come with much lower numbers the “low cost of electricity” (8%) and “the safety of nuclear facilities” (7%).

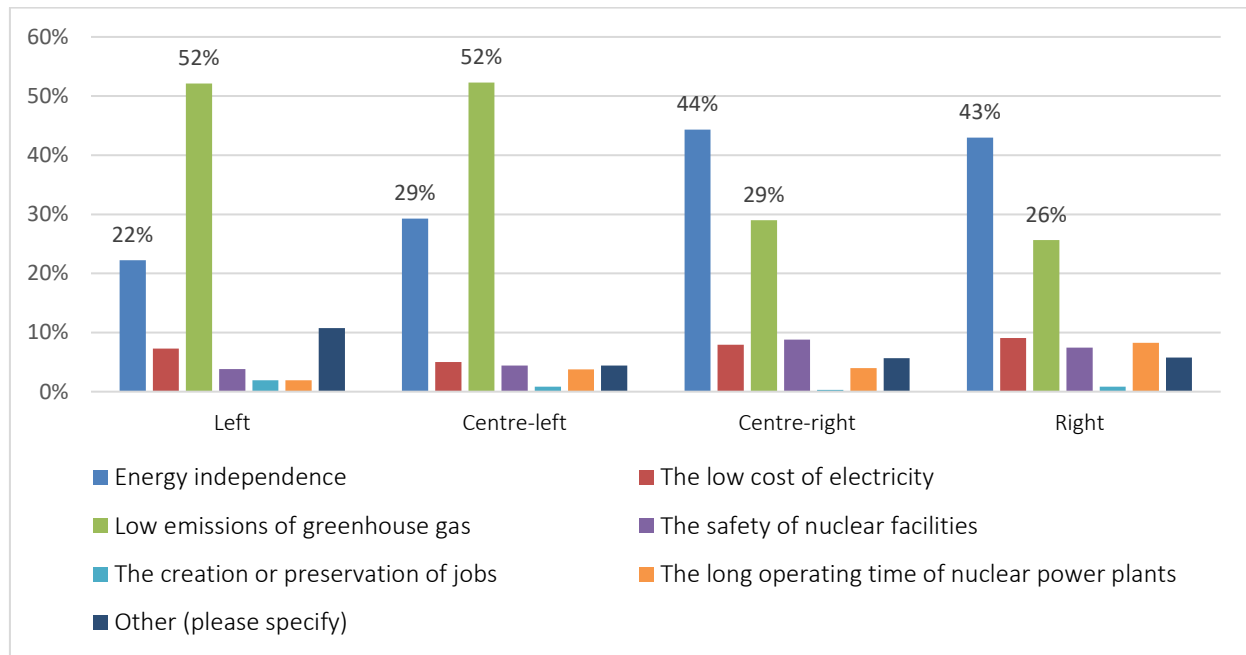
**Figure 5.13. What do you think is the strongest argument for nuclear power today? (only one reply possible)**



Among the countries with more than 100 replies, responses from France, Canada and Germany show a similar pattern: low GHG emissions come in first with 61%, 51% and 58%, energy independence is second with 23% in France and 21% in Canada and Germany. All other replies collect low percentages of replies. In Spain and the United States, the replies come in the same order but with less difference between the first two items: low GHG emissions collect respectively 42% and 38% while energy independence gather 30% and 31%. In Belgium and in the United Kingdom, energy independence is first (49% and 41%), ahead of low GHG emissions (34% and 36%). In Japan, energy independence also comes first (42%), but the safety of nuclear facilities is second with 21% - when that item averages 7% among all respondents – ahead of low GHG emissions (20%).

Replies varied depending on political leanings, with left-wing respondents widely favouring “the low emissions of greenhouse gas” (52%) ahead of energy independence (22%) while right-wing respondents placing energy independence (43%) strongly ahead of the low emissions of greenhouse gas (26%).

**Figure 5.14. What do you think is the strongest argument for nuclear power today? (replies according to political leanings)**



Replies also varied among age categories, but less strongly. All categories placed “the low emissions of greenhouse gas” ahead, except those aged 65 and older, who slightly favoured energy independence (36% to 33%). The youngest replied “the low emissions of greenhouse gas” slightly more than older respondents. This argument collected 43% among the 18-34 year-olds, to be compared with 38% among the 50-64 year-olds.

Replies were similar among women and men. Both rated low GHG emissions and energy independence first and second, in that order, with similar numbers. Women placed “the low cost of electricity” (9%) while men place third the safety of nuclear facilities (7%). Men also volunteer more alternate replies (9%) than women (4%).

## 5.9. Opinions regarding nuclear energy

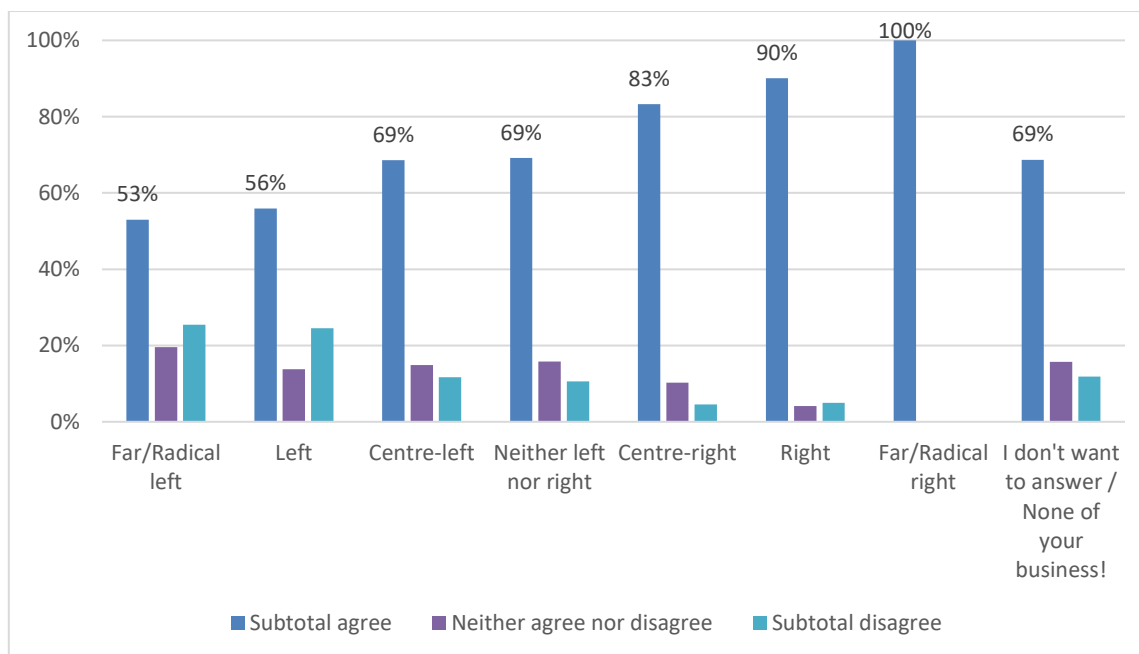
Three questions were asked to assess the position of respondents regarding nuclear energy. One asked if new nuclear power plants should be built, another asked whether building nuclear power plants in their country was a good thing (if applicable) and the third asked if the existing nuclear power plants in their country should be shut down (if applicable). The replies to all three show an opinion which is overall favourable to nuclear energy. A total of 74% declare that building nuclear power plants was a good thing, 71% are in favour of building new nuclear power plants and only 10% believe that “existing nuclear power plants must be closed”.

There were no significant differences of opinions among age brackets except for the fact that older respondents tend to express their opinions more strongly.

There were differences across the political spectrum. Regarding the construction of new nuclear power plants, the right is overwhelmingly in favour with 90% in agreement, including 73% strongly agreeing, while the left agreed at 56%, including 31% strongly. Accordingly, 85% among the right agreed (68% strongly) that “building nuclear power plants was a good thing” while they were 66% on the left to declare so, still a comfortable

majority, but a less striking one. Regarding the shutdown of existing nuclear power plants, the right-wing respondents widely disagreed (74%, including 58% strongly), while left-wing respondents disagreed at 56% (including 35% strongly).

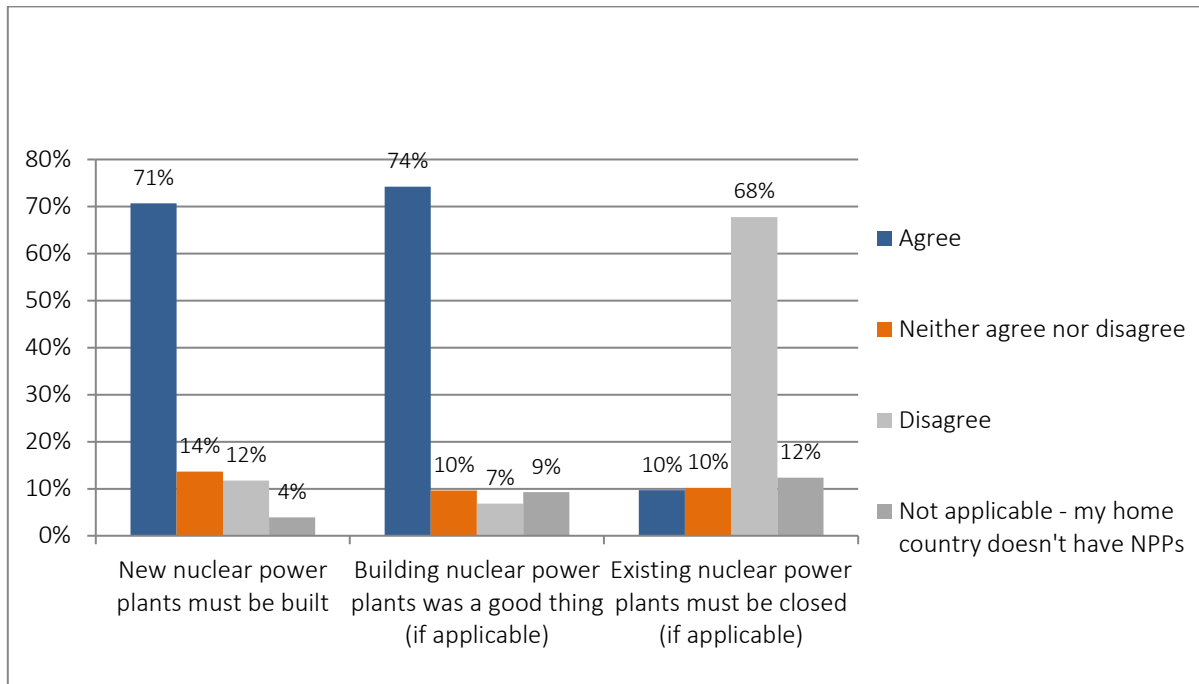
**Figure 5.15. New nuclear power plants must be built**



There were also differences among genders. Women agreed less massively than men that “new nuclear power plants must be built”, with 61% (including 33% strongly) against 75% among men (including 50% strongly). Differences were smaller in replies to the other two questions. Women were 70% to declare that building nuclear power plants was a good thing, compared with 76% among men. They agreed less strongly than men, with 35% agreeing strongly against 50% among men. Women disagreed at 64% (including 40% strongly) with the shutdown of existing nuclear power plants, compared with 70% among men (including 49% strongly).

Among countries with more than 100 replies, responses varied as well, with Germany an outlier. Majorities in all countries agreed that “building nuclear power plants was a good thing”. The highest approval was found in the United States (89%), closely followed by Belgium, Canada (both with 88%) and France (87%). The lowest total was for Germany, a distant last with 54%. Majorities also supported the construction of new nuclear power plants in all countries, except in Germany, where 50% disagreed and 39% agreed (the remainder being neutral). Regarding the shutdown of existing nuclear power plants, majorities disagreed in all countries except Germany, where 47% disagreed, 39% agreed and 8% were neutral. In other countries, disagreement was the strongest in Canada and the United States with 84% (including respectively 63% and 61% strongly) and Belgium with 78% (including 54% strongly).

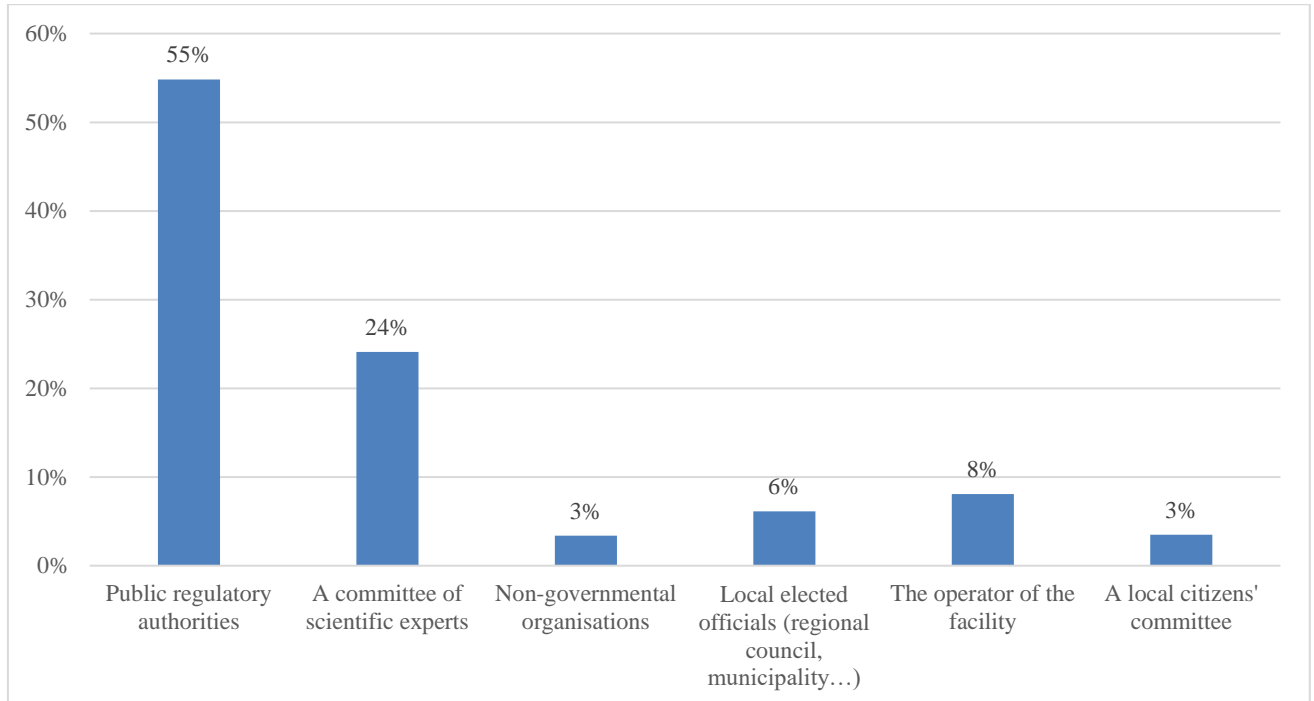
**Figure 5.16. Here are various statements relating to nuclear energy in your home country. For each one, please indicate according to the following scale if you agree or disagree (one reply per line expected).**



### 5.10. Public regulatory authorities and scientific experts and favoured to oversee nuclear activities

A majority of respondents (55%) declared that “public regulatory authorities” should be in charge of overseeing the environmental and health impact outside a facility that poses risks to the environment and neighbouring populations. “A committee of scientific experts” came in second with 24% of replies. The four other proposed options have been far less selected: “the operator of the facility” collected 8% of replies, “local elected officials (regional council, municipality...)” were selected by 6%, “a local citizens’ committee” and non-governmental organisations (NGOs) by 3%.

**Figure 5.17. Regarding the oversight of the impact of a facility that poses risks to the environment and neighbouring populations, who do you think should control the environmental and health impact outside the facility? (only one reply possible)**



Public regulatory authorities were placed ahead in all countries with more than 100 replies, usually by far, except in Belgium, where they collected 44% and “a committee of scientific experts” came close second with 41%. In all countries with more than 100 replies, “a committee of scientific experts” came in second, except in Japan, where “the operator of the facility” placed second with 23%, and scientific experts third with 15%.

Respondents who have never worked in the nuclear sector also placed public regulatory authorities first (46%), ahead of “a committee of scientific experts” (32%), but with a lesser margin than persons who currently or formerly worked in the sector, for which the results were respectively 60% and 19%.

The youngest respondents, while still ranking public regulatory authorities first, placed “a committee of scientific experts” a close second. Among the 18-34 year-olds, public authorities gathered 43% and scientific experts 33%, while among the 35 year-olds and older, the results were 58% and 21%.

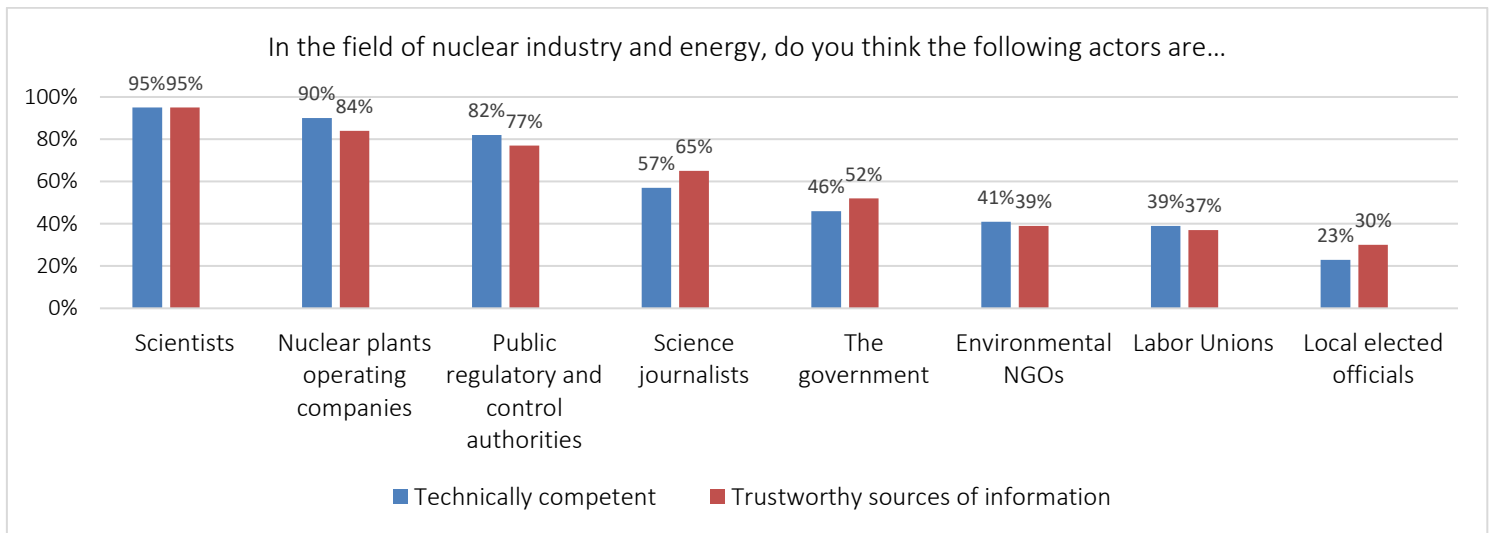
There were no significant differences across the political spectrum or between women and men.

### 5.11. Scientists are deemed most competent and most trustworthy in the nuclear field

Respondents were asked their opinion on the competence and trustworthiness of several actors of the nuclear field in the home country. Scientists came up on top twice, with the same very high score (95%) of perceived competence and trustworthiness. “Nuclear plants operating companies” and the “public regulatory and control authorities” both also received

high competence scores (90% and 82%) and trustworthiness ratings (77% and 84%). Science journalists were next in terms of competence with 57% of positive opinions. They also ranked 4<sup>th</sup> for trustworthiness, collecting 65% of favourable opinions. The last four positions regarding both questions are occupied by “the government” (46% of competence, 52% of trustworthiness), “environmental NGOs” (41% and 39%), “labour unions” (39% and 37%), and “local elected officials” (23% and 30%).

**Figure 5.18. In the field of nuclear industry and energy, do you think the following actors are...**



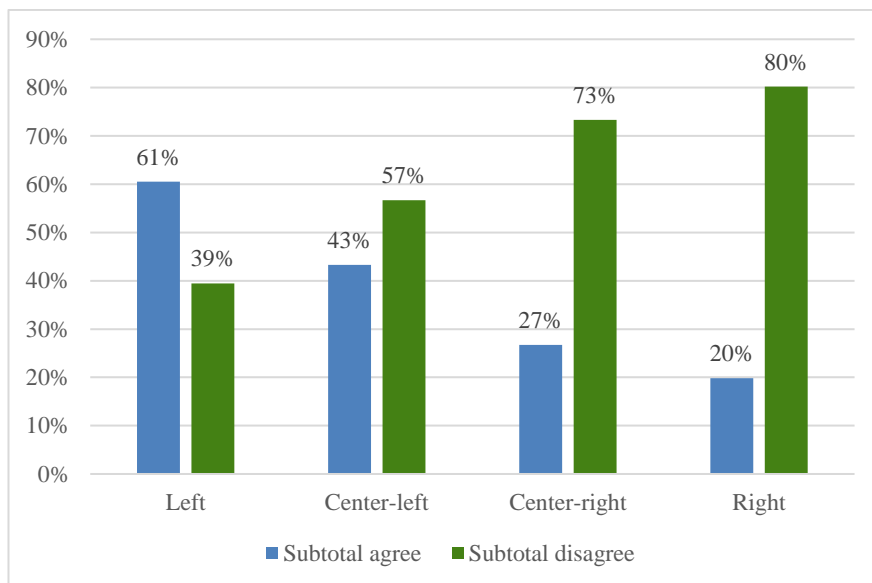
Environmental NGOs and science journalists are perceived as competent by the youngest, garnering 49% and 61% of the responses, respectively, from the 18-34 year-olds. There were no other strong differences noted, be it regarding perceived competence or trustworthiness.

Women also deem environmental NGOs and science journalists more competent than men do. Environmental NGOs collected 54% of positive opinions among women and 36% among men, while science journalists collected respectively 65% and 53%. No strong difference was noted for other actors regarding competence. In terms of trustworthiness, Environmental NGOs and science journalists also gathered higher scores among women, with 53% against 32% among men for NGOs and 72% against 61% for science journalists. A slighter difference was also observed regarding labour unions, seen as slightly more trustworthy by women (41% against 35%).

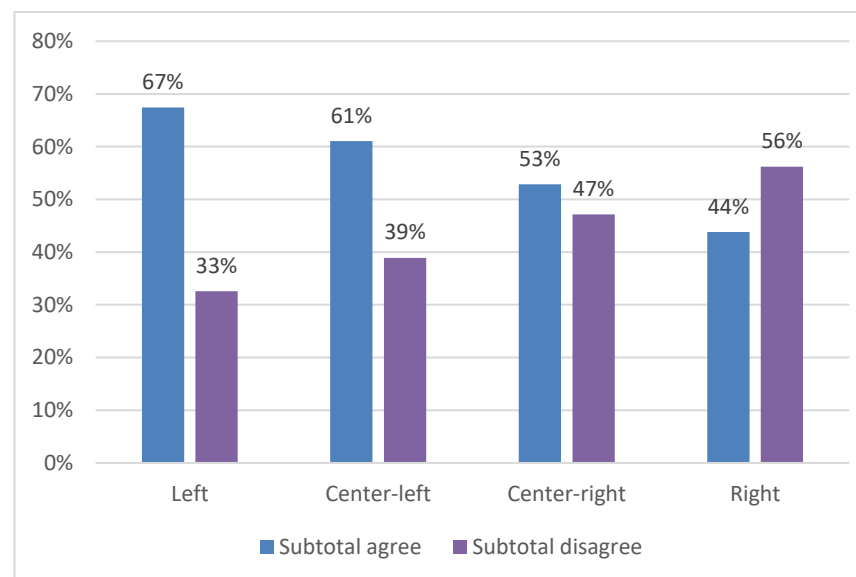
Environmental NGOs were also seen as much more competent by left-wing respondents (61% agreeing) than right-wing respondents (20% agreeing). Science journalists are also seen in a more favourable light on the left (67%) than on the right (44%). It is also the case for labour unions, which gather 57% of favourable opinions on the left as opposed to 22% on the right. It is also the case, on a lesser level, for public regulatory authorities, which gather strong competence scores, but higher on the left (85%) than on the right (76%).

**Figure 5.19. In the field of nuclear industry and energy do you think the following actors are technically competent in your home country? (replies according to political leanings)**

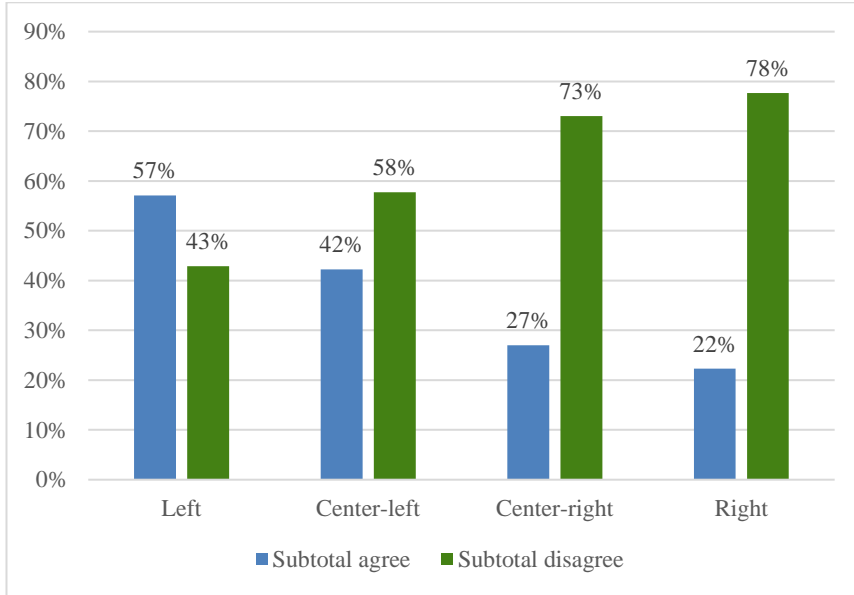
### A. Environmental NGOs



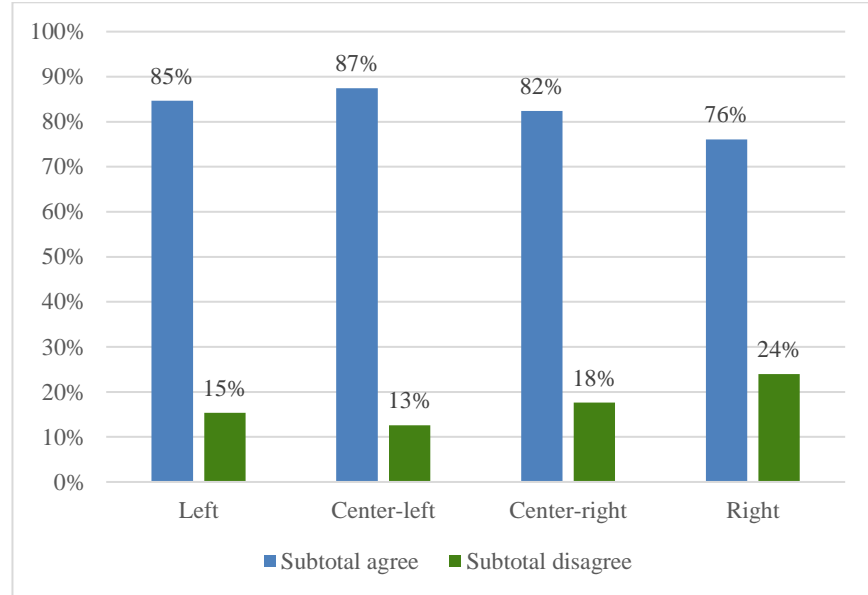
### B. Science journalists



**C. Labour unions**



**D. Public regulatory and control authorities**



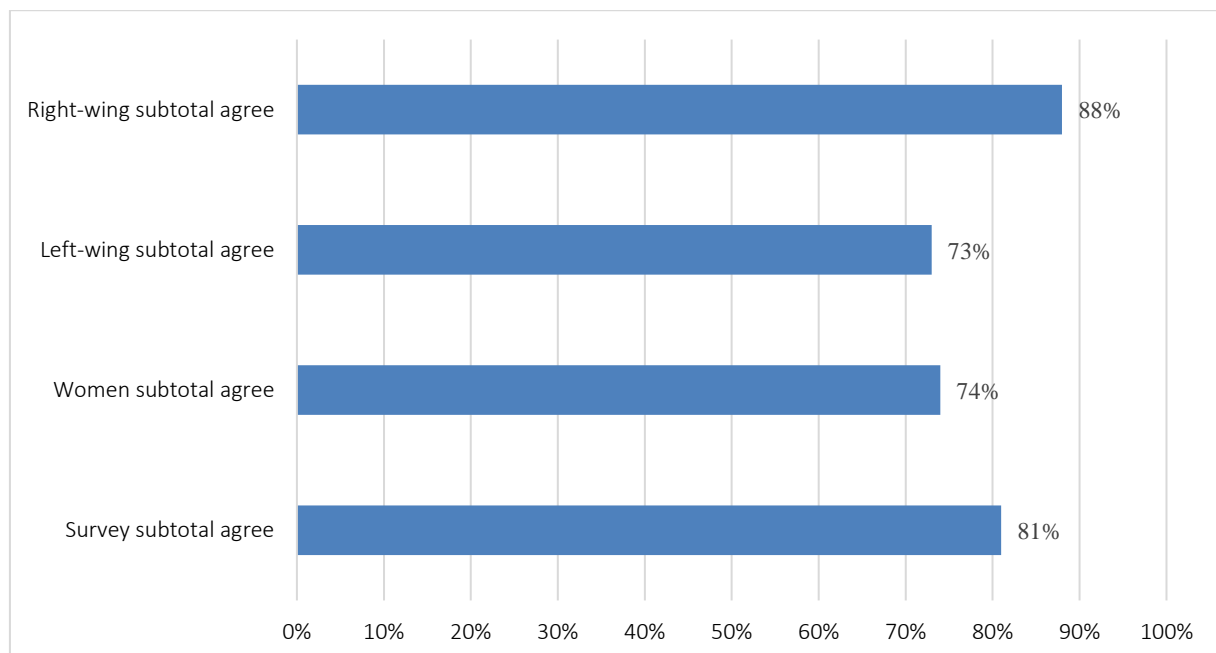
Environmental NGOs are seen as particularly less competent on nuclear matters in Spain, Belgium and Japan, with respective negative opinions of 73%, 71% and 70%. The government is seen as particularly incompetent in these matters in Belgium, Spain, Germany and France, with negative opinions totalling respectively 76%, 68% and 61% (for Germany and France alike). Local elected officials are seen as particularly lacking competence on nuclear issues in Belgium and Spain, with respective totals of negative opinions of 94% and 87%. Science journalists are seen as more competent in Canada (76%), the United States (70%) and the United Kingdom (69%) than in Belgium (47%) or Japan (45%).

### 5.12. The impact of nuclear facilities is perceived as low

Three questions were designed to assess the perceived impact of nuclear facilities. To the statement “Radioactivity from nuclear power plants will cause cancers”, 62% replied they disagreed while 15% were in agreement. Disagreement was stronger (69%) within respondents working or having worked in the nuclear field, compared to 50% in the “non-nuclear” sample. In the 2023 IRSN Barometer, the respective results were close to the non-nuclear sample of the NEA study, with 48% of disagreement and 16% in agreement. Disagreement was stronger among men (65%) than women (55%). People identifying politically with the right also disagreed in stronger numbers, totalling 72% against 58% among left-wing people. There were no significant differences among age brackets.

To the statement “Around nuclear facilities, people are as healthy as elsewhere”, a wide majority of 81% agreed. Among respondents working or having worked in the nuclear field 88% agreed against 69% in the “non-nuclear” sample, to be compared with only 43% in the 2023 IRSN Barometer. People from the left of the political spectrum disagreed more (11%) than people from the right (3%). Women agreed to a lesser extent (74%) than men (84%), as more gave a neutral reply (18% compared to 12% among men). There were no significant differences between age categories.

**Figure 5.20. “Around nuclear facilities, people are as healthy as elsewhere”**

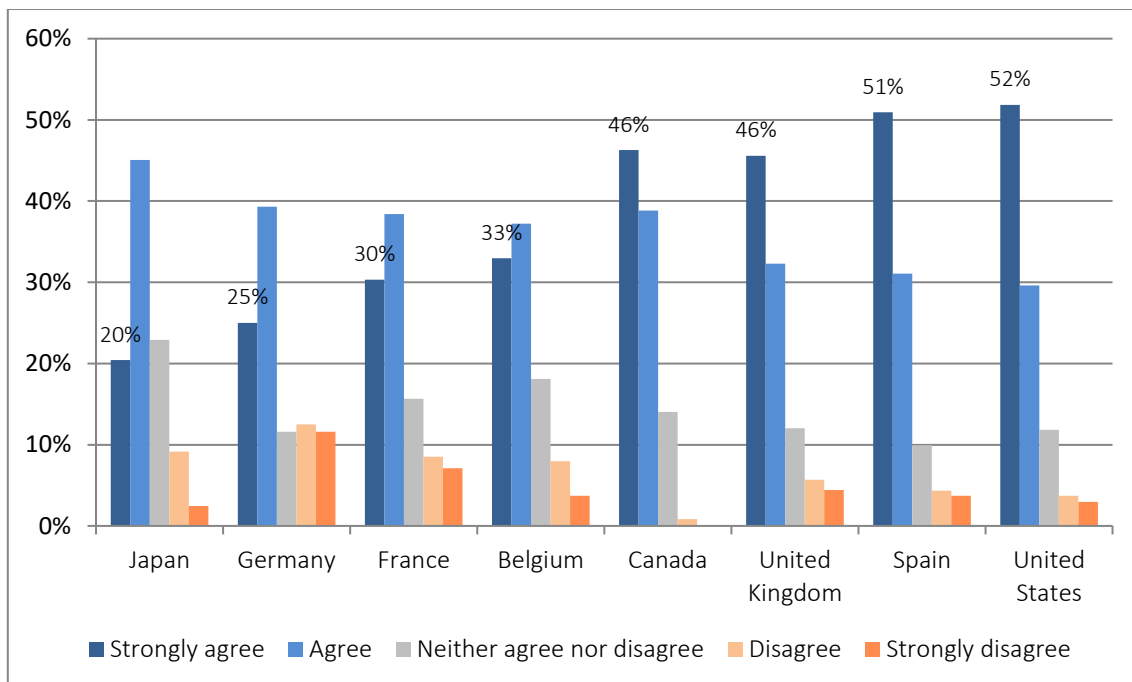


Finally, regarding the statement “Nuclear sites in my country are causing groundwater contamination (if applicable)”, only 7% agreed and 64% disagreed (13% replied their country does not have nuclear power plants). Among respondents working or having worked in the nuclear field 8% agreed and 71% disagreed, against 6% who agreed and 53% who disagreed in the “non-nuclear” sample, in which 23% “neither agreed nor disagreed”. Men disagreed more (66%) than women (60%), who gave more neutral answers, just like younger respondents disagreed less (58% among the 18-24 year-olds compared to 71% among the 50-64 year-olds) and gave more neutral replies (respectively 25% among the 18-24 year-olds and 14%). In the IRSN study, 34% agreed and 25% disagreed.

### 5.13. A solution for radioactive waste?

Presented with the statement “Today, it is possible to safely store nuclear waste”, 74% agreed and 11% disagreed. Among countries with more than 100 replies, the agreement is highest in Canada (85%), Spain (82%) and the United States (81%) and lowest in Germany (64%) and Japan (65%). These totals remain much higher than those recorded in the 2023 IRSN Barometer, in which 33% agreed while 32% disagreed.

*Figure 5.21. Today, it is possible to safely store nuclear waste*



### 5.14. A nuclear accident does not seem probable to respondents

A wide majority of respondents (71%) do not believe that an accident of the same magnitude as the one in Fukushima can occur in their home country. No significant difference in replies was noted across age brackets or between men (28% yes) and women (32% yes). There were differences across the political spectrum, with 38% of left-wing respondents declaring they believed such an accident could occur in their country, against 15% of right-wing respondents. This is to be compared with 56% of the French respondents in the 2023 IRSN study.

Further questioned about the probability of such an accident, 57% replied it seemed not at all likely to them, while 33% replied it seemed somewhat unlikely and 10% responded it

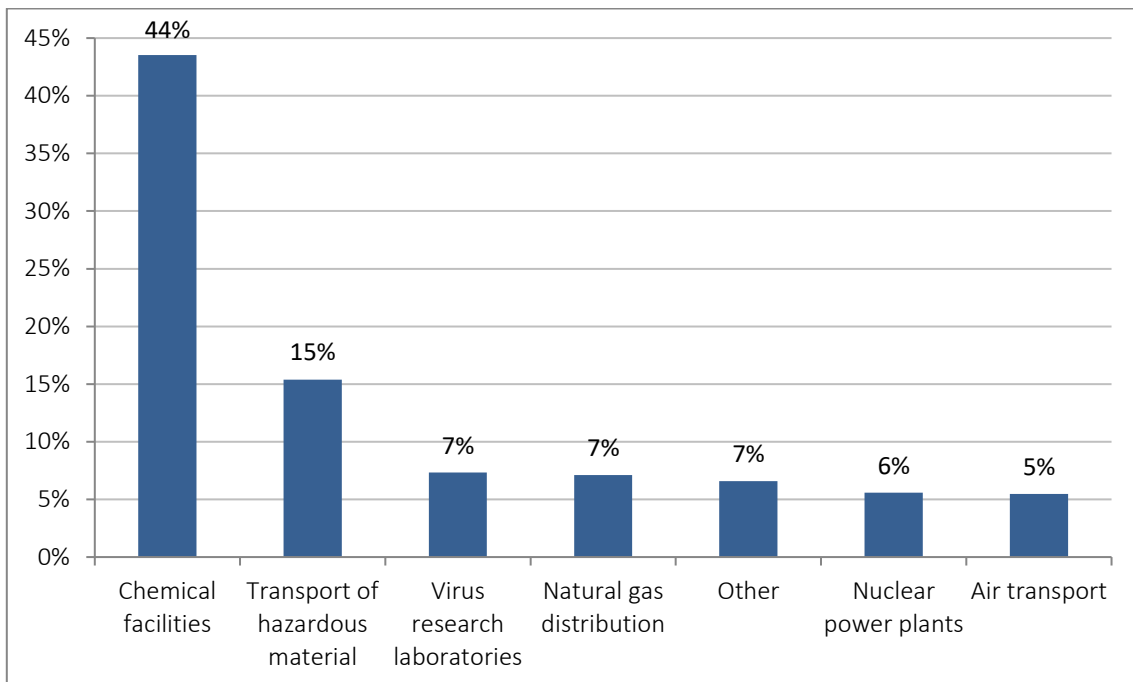
seemed very or somewhat likely. Respondents to the 2023 IRSN Barometer replied at 56% it seemed likely while 44% believed it was unlikely.

### 5.15. Industrial or technological activity most likely to cause a serious accident or a disaster

With 44% of replies, chemical facilities are those deemed most likely to cause a serious accident or disaster in the respondents' countries. The transport of hazardous materials comes second with 15% and all others (including virus research laboratories, natural gas distribution and dams) range from 7% to 4%. Nuclear power plants are at 6% and radioactive waste material have the lower score with 4%. Among people who declared working or having worked in the nuclear sector, chemical facilities come in first with 48%, while nuclear power plants and radioactive waste disposals record respectively 5% and 1% (compared to 7% and 8% among the "non-nuclear" respondents). Chemical facilities and the transport of hazardous materials also came out first and second across all age brackets.

These results are different from the 2023 IRSN Barometer results, in which nuclear power plants come first (28%), ahead of radioactive waste disposals and chemical facilities (both with 19%) and virus research laboratories (17%).

**Figure 5.22. Which of the following industrial or technological activities do you think is most likely to cause a serious accident or a disaster in your home country? (only one reply possible)**

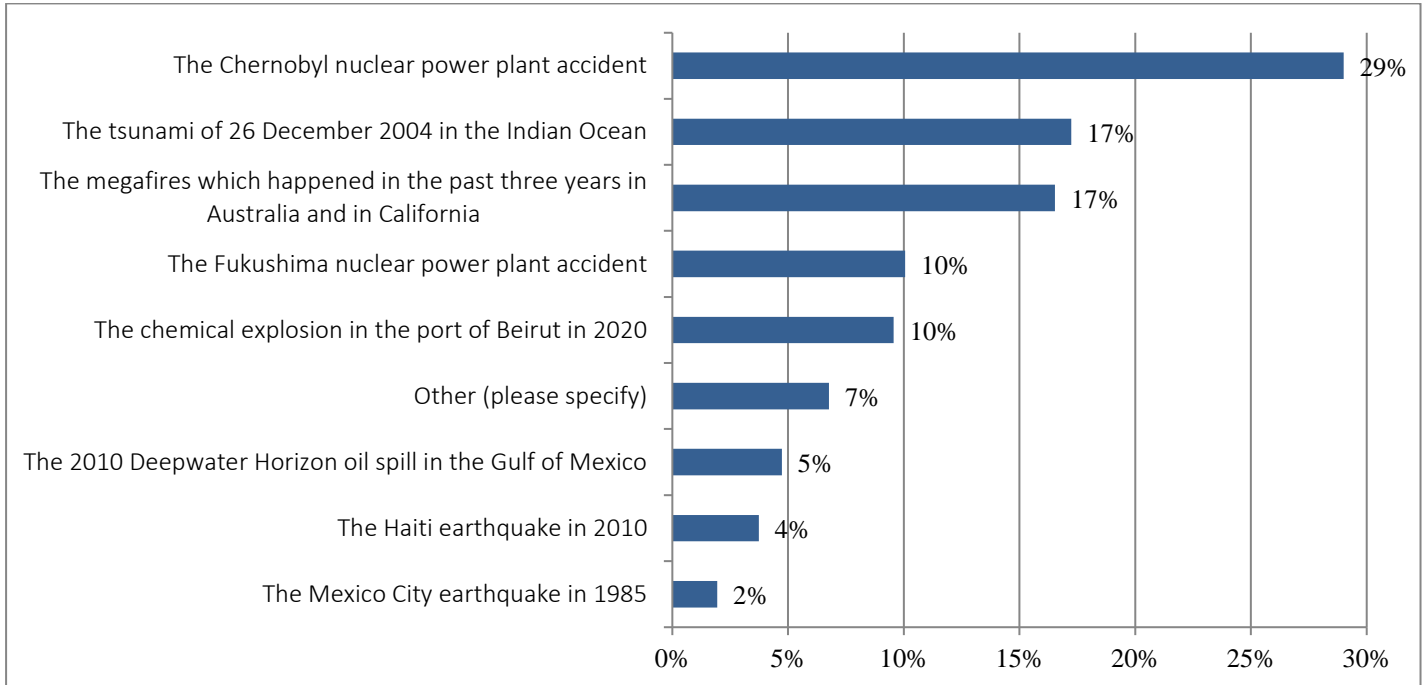


Chemical facilities come in first in all countries with more than 100 respondents except Canada, where the transport of hazardous material comes ahead with 28%, while chemical facilities gather 26%. In France and Spain, chemical facilities gather very high numbers, with respectively 61% and 58% of replies. In Japan, they collect 31% while nuclear power plants collect 21%, a number of replies significantly higher than in other countries.

There are no notable differences between genders, age brackets or political leanings.

### 5.16. The most frightening catastrophic events

**Figure 5.23. Which of the following catastrophic events do you find most frightening? (only one reply possible)**



The Chernobyl nuclear accident comes ahead as the most frightening catastrophic event with 29% of replies, in front of the tsunami of 26 December 2004 in the Indian Ocean (17%) and the megafires which took place in the past few years in Australia, Canada and the United States (17%). In the 2023 IRSN Barometer, the Chernobyl accident is first as well, with 39% of replies.

Women and men alike ranked the Chernobyl accident first, with respectively 33% and 28% of replies. Women then placed the megafires (22%) while men placed the tsunami of December 2004 in the Indian Ocean (19%).

Almost every country with more than 100 replies ranked the Chernobyl accident first except for Canada and the United States, which both placed the megafires first, largely in Canada with 32%, and a little less so in the United States with 24% (the survey was conducted before the dramatic 2023 fires), and Japan, which placed the Fukushima nuclear accident first with 34% and the Chernobyl accident second with close to 34%.

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