

Press Release

Czech public opinion on issues of radioactive waste and deep geological repository – July 2021

- ⊙ Only one in five Czech citizens consider themselves well informed about matters of radioactive waste.
- ⊙ In matters of nuclear safety, the public considers scientists and experts the most reliable; relatively high levels of reliability are also attached to the State Office for Nuclear Safety and, to a lesser extent, “the government authority concerned with the disposal of radioactive waste”.
- ⊙ Three in five citizens believe that today’s society should actively address the problem of radioactive waste.
- ⊙ Half of the public find a deep geological repository to be the safest way of addressing the problem of radioactive waste.
- ⊙ More than three in four citizens believe that municipalities should have the right to refuse the building of a deep geological repository in their territory.

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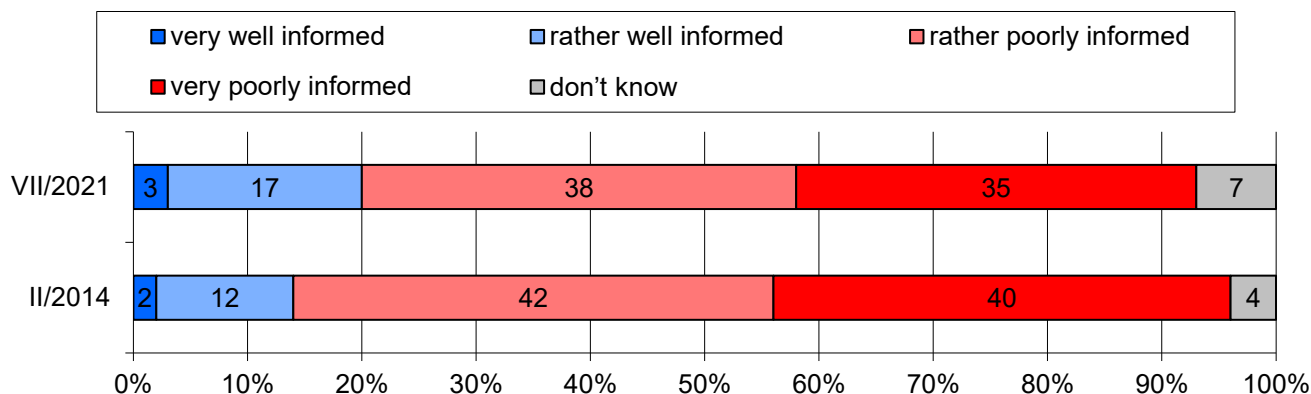
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In its July 2021 survey, the Our Society series included a battery of questions on issues of the energy system, with a detailed focus on nuclear energy and some aspects of handling radioactive waste. The study inquired how well informed about nuclear waste citizens themselves feel, how reliable they consider different sources of information on nuclear safety, how they think spent nuclear fuel and radioactive waste are currently being handled in the country, how today’s society should respond to the problem of radioactive waste, and how they view different issues of building a deep geological repository of radioactive waste.

Graph 1: How well informed one is about matters of radioactive waste (%)¹



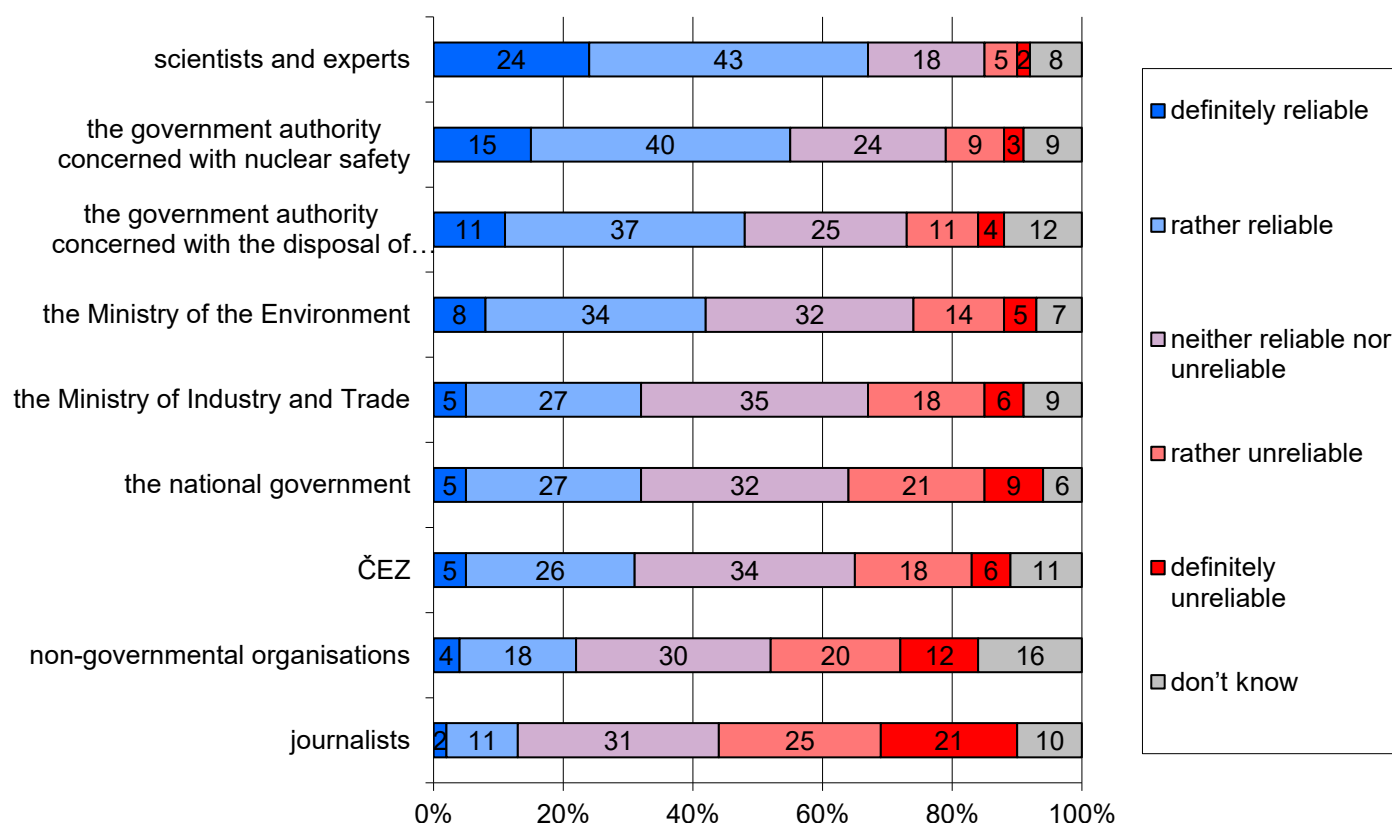
Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

The data in Graph 1 indicate that only one in five (20%) citizens consider themselves well informed about matters of radioactive waste, including 3% who believe they are “very well informed” and 17% “rather well informed”. In contrast, almost three in four (73%) survey respondents referred to themselves as poorly informed, including 38% “rather poorly” and 35% “very poorly” so. The remaining 7% were unable to decide and picked the “don’t know” option. Compared to the February 2014 survey, there has been a growth of 6 percentage points (pp) of the share of respondents who consider themselves well informed on matters of radioactive waste and a 9-pp decline of those subjectively poorly informed.

Detailed analysis revealed that men consider themselves somewhat better informed on matters of radioactive waste than women (with 25% of “well” informed men compared to 16% of women, and women considerably more likely than men to answer “very poorly” – 41% compared to 30%, respectively). As for educational attainment, college graduates view themselves as relatively better informed and individuals with primary education as more poorly informed. The declared level of information also grows with household’s subjective standard of living. In addition, higher declared levels of information are found among individuals who are not at all concerned about nuclear energy use and who think that the proportion of nuclear energy in electricity production should increase in future.

¹ Question wording: “How well informed are you about matters of radioactive waste?” Response options: very well informed; rather well informed; rather poorly informed; very poorly informed.

Graph 2: Reliability of nuclear safety information sources²



Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

² Question wording: "How reliable or unreliable do you find the following sources of information on nuclear safety? (a) the national government, (b) Ministry of the Environment, (c) the Ministry of Industry and Trade, (d) ČEZ, (e) the government authority concerned with nuclear safety, (f) the government authority concerned with the disposal of radioactive waste, (g) non-governmental organisations, (h) scientists and experts, (i) journalists." Response options: definitely reliable, rather reliable, neither reliable nor unreliable, rather unreliable, definitely unreliable.

Table 1: Reliability of nuclear safety information sources, time comparison (%)

	2014			2021		
	R	O	U	R	O	U
scientists and experts	79	13	4	67	18	7
the government authority concerned with nuclear safety	61	21	11	55	24	12
the government authority concerned with the disposal of radioactive waste	68	18	9	48	25	15
Ministry of the Environment	58	22	14	42	32	19
Ministry of Industry and Trade	41	30	21	32	35	24
national government	41	31	22	32	32	30
ČEZ	31	29	31	31	34	24
non-governmental organisations	38	26	20	22	30	32
Journalists	27	32	35	13	31	46

Note: R = "definitely reliable" + "rather reliable", O = "neither reliable nor unreliable", N = "rather unreliable" + "definitely unreliable". Percentages do not add up to 100 as "don't knows" are not shown.

Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost).

The results in Graph 2 and Table 1 indicate that scientists and experts are considered the most reliable sources of information on nuclear safety. Two in three (67%) citizens find them reliable, including 24% definitely and 43% rather so. Only 7% of the respondents consider scientists and experts unreliable, including 5% rather and 2% definitely so. 18% find them neither reliable nor unreliable and the remaining 8% were unable to decide and picked the "don't know" option. The comparison with the year 2014 shown in Table 1 indicates a relatively clear (12 pp) decline of the share of those who view scientists and experts as reliable sources of information on nuclear safety. This is reflected in a slight growth of the share of neutral evaluations and a growth of "don't knows", whereas the change in the share of "unreliable" answers is around the margin of statistical error. At the same time, as will be shown below, all nuclear safety information sources studied, with the single substantial exception of ČEZ, have been affected, to a greater or lesser extent, by a similar decline in perceived reliability, accompanied by a significant growth of perceived unreliability in some cases.

The second highest level of perceived reliability of all sources of nuclear safety information studied was found for "the government authority concerned with nuclear safety", namely the State Office for Nuclear Safety (SÚJB). 55% of the respondents found SÚJB to be a reliable information source, including 15% definitely and 40% rather so, as opposed to 12% who found it unreliable (9% rather and 3% definitely so). 24% of the respondents considered SÚJB as neither reliable nor unreliable while the remaining 9% remained undecided and picked the "don't know" option. Since the year 2014, there has been only a slight (6-pp) decline of the share of those viewing SÚJB as a reliable source of nuclear safety information.

The government authority concerned with the disposal of radioactive waste, namely the Radioactive Waste Repository Authority (SÚRAO), ranks third, viewed as a reliable source by slightly under one-half (48%) of the respondents (11% definitely and 37% rather so). In contrast, 15% viewed SÚRAO as an unreliable source, including 11% rather and 4% definitely so. One in four respondents (25%) picked the "neither reliable nor unreliable" option and the remaining 12% could not decide on this question. Compared to 2014, there has been a considerable (20 pp) decline of those who perceive SÚRAO as reliable, which is reflected in a slight (6-pp) growth of perceived unreliability as well as a 7-pp growth of neutral evaluations and an equal growth of "don't knows". In 2014, SÚRAO ranked as the second most reliable source of nuclear safety information among those then studied, with a relatively clear advantage over SÚJB. Now their positions have reversed, although SÚJB, too, has seen a slight decline of perceived reliability.

The Ministry of the Environment (ME) ranks fourth, only viewed as a reliable source of nuclear safety information by slightly over two in five (42%) members of the Czech public, including 8% who viewed it as definitely and 34% rather reliable. In contrast, just under one in five (19%) of the respondents considered ME to be an unreliable source of nuclear safety information, including 14% rather and 5% definitely so. Almost one in three respondents (32%) evaluated ME's reliability in neutral terms and 7% said they did not know. Compared to 2014, the ME, too, has seen a

considerable (16 pp) decline of perceived reliability and a slight (5-pp) increase of perceived unreliability, accompanied by a 10-pp growth of the share of neutral evaluations.

The following three ranks (5 through 7) are occupied by the Ministry of Industry and Trade (MIT), the national government, and ČEZ. Fewer than one in three respondents perceived these as reliable sources of nuclear safety information. The MIT and the government were viewed as reliable sources of nuclear safety information by the equal shares of 32%, including 5% definitely and 27% rather so in both cases. 24% of the respondents viewed the MIT as unreliable (18% rather and 6% definitely so), 35% gave neutral evaluations and 9% picked the “don’t know” option. The government was more often perceived as unreliable than MIT, namely by 30% of the respondents, including 21% rather and 9% definitely so. Neutral evaluations accounted for 32% and “don’t knows” for 6% of all answers. On one hand, the perceived reliability levels of MIT and national government were practically equal in 2014 and both have declined by an equal margin of 9 pp in the present survey. On the other hand, the government has also seen a considerable (8-pp) growth of perceived unreliability, compared to only a statistically insignificant growth in the case of MIT, one within the margin of statistical error. As for ČEZ, 31% viewed it as a reliable source of nuclear safety information (5% definitely and 26% rather so), 24% found it unreliable (18% rather and 6% definitely so), 34% gave neutral evaluations and 11% remained undecided. In contrast to all other items studied, ČEZ has seen no decline of perceived reliability, which remained practically the same as in 2014. In contrast, there has been a minor (7-pp) decline of perceived unreliability.

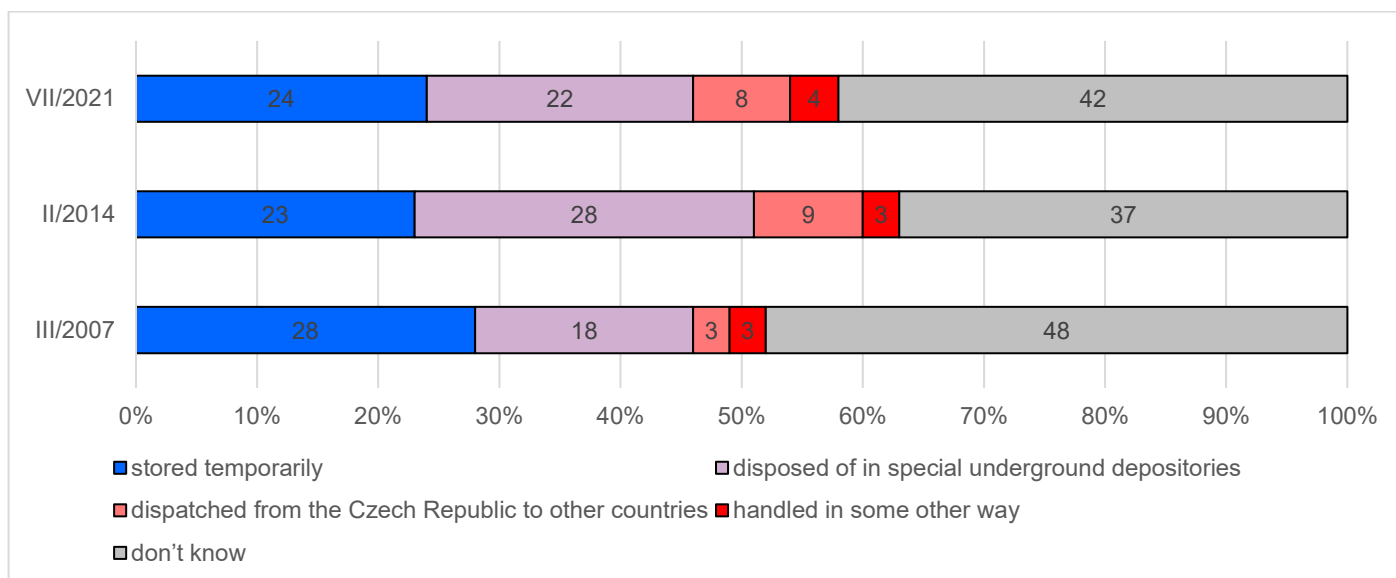
Even lower levels of perceived reliability as sources of nuclear safety information were observed for non-governmental organisations, which were only viewed as reliable by 22% (4% definitely and 18% rather so), compared to almost one-third (32%) of the respondents who found them unreliable (20% rather and 12% definitely so). 30% gave neutral evaluations and 16% picked the “don’t know” option. Compared to the year 2014, non-governmental organisations have seen a substantial (16 pp) decline of perceived reliability and only a slightly weaker (12 pp) growth of perceived unreliability, with a 4-pp increase in neutral evaluations.

Journalists are perceived as the least reliable sources of nuclear safety information by far, found reliable by as little as 13% of the respondents, including 2% definitely and 11% rather so. 46% considered journalists to be an unreliable source, including 25% rather and 21% definitely so. 31% gave neutral evaluations of journalists’ reliability and 10% remained undecided. The share of perceived reliability of journalists has declined by 14 pp since 2014 and unreliability has seen an 11-pp growth.

More detailed analysis of interrelationships between the different sources’ reliability for nuclear safety information reveals that the national government is positively correlated with all other items except non-governmental organisations, albeit that relationship is relatively weaker for journalists and, to a lesser extent, scientists and experts. In the similar cases of MIT and ČEZ, the correlation is weak for journalists and not statistically significant for non-governmental organisations. Perceived reliability of ME is positively correlated with all other items, albeit the relationship is again weak and around the margin of statistical error for non-governmental organisations and journalists. Perceived reliability of both SÚJB and SÚRAO is positively correlated with other sources except non-governmental organisations and journalists. Evaluations of non-governmental organisations are relatively strongly correlated with those of journalists and significantly, albeit more weakly, with those of scientists and experts as well as the ME. Evaluations of scientists and experts are significantly correlated with other items except journalists. In the case of journalists, all correlations except for non-governmental organisations are weak or not statistically significant. This is supported by the results of factor analysis. A varimax-rotated analysis yielded two independent factors that explain 62% of the variance. With a 46% share of explained variance, the first factor in the rotated analysis includes national government, ME, MIT, SÚJB, SÚRAO, ČEZ, and scientists and experts. The second factor explains 16% of the total variance and includes journalists and non-governmental organisations.

As for sociodemographic differences, men were more likely to view national government or SÚJB as more reliable sources of nuclear safety information. In terms of age, national government was viewed more positively among respondents aged 60+ whereas perceived reliability of non-governmental organisations somewhat declined with growing age. In terms of age, with the “don’t know” options excluded, there were no statistically significant differences in perceived reliability of the institutions studied. Government institutions, ČEZ, and scientists and experts were generally found more reliable among proponents of nuclear energy, non-governmental organisations among its opponents.

Graph 3: Notions of how spent nuclear fuel and high-level radioactive waste are being handled (%)³



Note: The 2007 question featured an additional response option, “they are being disposed of on seabed”, with a frequency of 1%. Due to the extremely low frequency, that option was excluded from the later wording and subsumed under the option, “they are being handled in some other way”.

Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

The question on people’s notions of the way spent nuclear fuel and high-level radioactive waste are being handled in the Czech Republic presented four options to the respondents. The first option, namely that those materials are being stored temporarily and a final handling solution will be taken some time in future, came closest to the actual situation. Graph 3 presents the results, including time comparison with the 2014 and 2007 surveys.

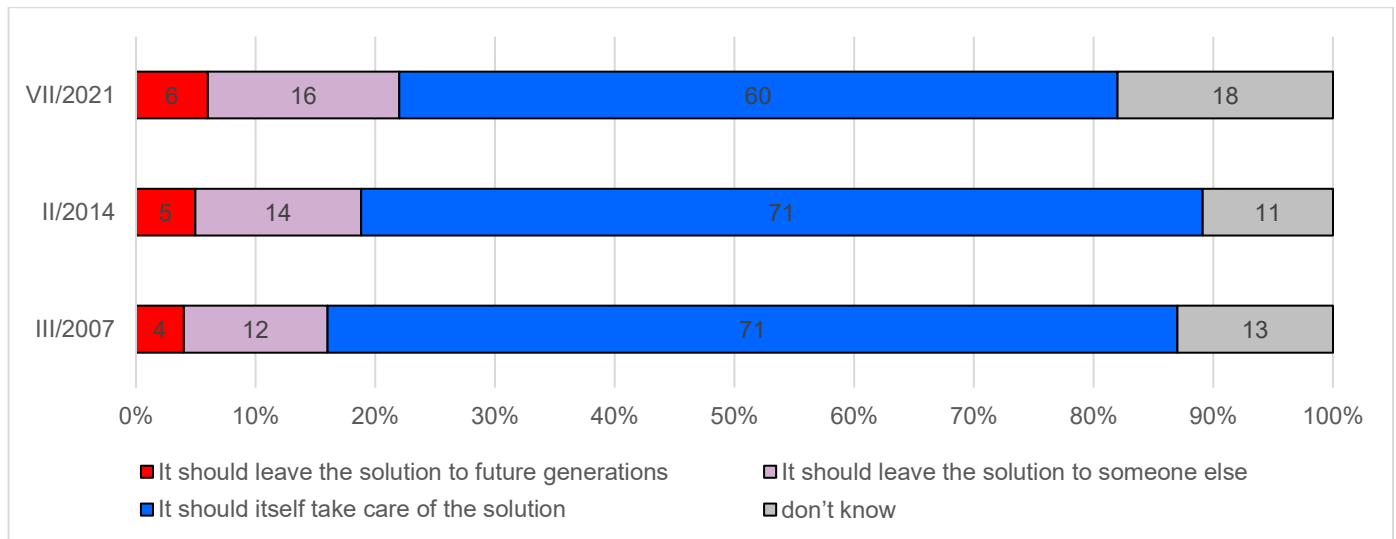
The most factually accurate option of temporary storage pending a final solution was picked by almost one in four respondents (24%), a result fully comparable with that of 2014 and 4 pp lower than in the year 2007. The option of disposal in a deep geological repository, which does not exist at the time and is merely a planned future solution, was selected by as little as 2 pp fewer respondents than the above first option, namely 22%. This was a 6-pp lower share than in 2014 but 4 pp more than in 2007. The option of dispatching spent nuclear fuel and high-level radioactive waste abroad was picked by 8% of the respondents, a result comparable with the year 2014 and 5 pp above the year 2007. “Some other way” of handling spent nuclear fuel and high-level radioactive waste was reported sporadically, by one in twenty-five respondents (4%), which is comparable to the 2007 and 2014 results. More than two in five respondents (42%) admitted they did not know how spent nuclear fuel and high-level radioactive waste are currently being handled in the Czech Republic; this was 5 pp more than in 2014 but 6 pp less than in 2007. Overall, we have seen a growing share of inaccurate answers after the 2007 survey, which already occurred in 2014 and was only confirmed, in a slightly milder form, by the present survey.

Detailed analysis reveals that the correct option of temporary storage is more often reported by men (31%) than women (18%), while the “don’t know” option was more often picked by women (48% as opposed to 36% of men). As for educational attainment, college graduates were more likely to select the correct answer (32%). The correct answer was also much more often given by individuals who consider themselves very well informed (69%) or rather well informed (39%) about radioactive waste. At the same time, though, those subjectively rather well informed about radioactive waste were more likely to pick the deep repository option (34%); to a lesser extent, an above-average

³ Question wording: “Do you have an idea of how spent nuclear fuel and high-level radioactive waste are currently being handled in the Czech Republic? Do you think they are being stored temporarily and a final solution on how they will be handled will be taken some time in future, they are being disposed of in special underground depositories deep in the ground, they are being dispatched from the Czech Republic to other countries for final disposal, they are being handled in some other way?”

share of that option (27%) was also found among those who viewed themselves as rather poorly informed. Finally, those very poorly informed typically picked the “don’t know” option (60%).

Graph 4: How today’s Czech society should respond to the problem of radioactive waste (%)⁴



Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

The next question studied Czech public opinion on responding to the problem of radioactive waste. The data in Graph 4 indicates that most of the respondents (60%) agreed that today’s Czech society itself should take care of the solution. Only 6% thought today’s Czech society should leave the solution to future generations and 16% agreed that it should leave the solution to someone else, e.g. by exporting radioactive waste to other countries. 18% of the respondents were unable to decide and picked the “don’t know” option. Compared to the two previous surveys of 2007 and 2014, we have seen an 11 pp lower share of those convinced that today’s Czech society itself should take care of the solution, accompanied by a higher share of “don’t knows” and, compared to 2007, a slightly (4 pp) higher preference of leaving the solution of the radioactive waste problem to someone else, e.g. by exporting the material to other countries.

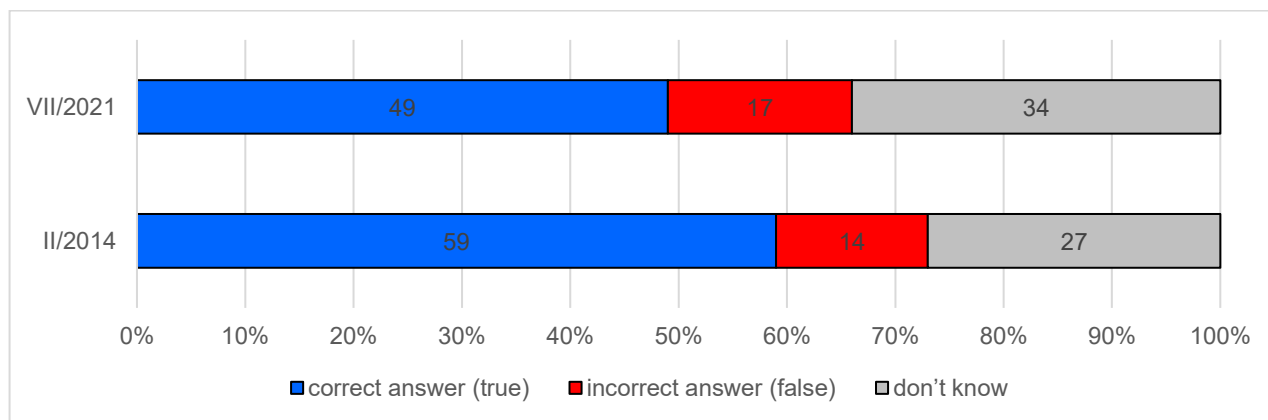
Detailed analysis reveals that college graduates and those who correctly stated that spent nuclear fuel and high-level radioactive waste are being stored temporarily, pending a final solution in future, were more likely to agree that today’s Czech society itself should directly respond to the problem. Those subjectively well informed about radioactive waste were more likely to prefer shifting the problem to someone else by exporting the materials or leaving the solution to future generations. The option of shifting the problem to someone else by exporting radioactive material to other countries was largely preferred by those who believe this is already happening.

The next part of our survey paid detailed attention to the very issues of deep geological repository. First, all respondents were presented with six statements testing their knowledge of the subject matter by asking them whether those were true or false.⁵

⁴ Question wording: “How do you think today’s Czech society should respond to the problem of its own radioactive waste?” Response options: (a) It should leave the solution to future generations; (b) It should leave the solution to someone else, e.g. export the waste to other countries; (c) Today’s Czech society itself should take care of the solution.”

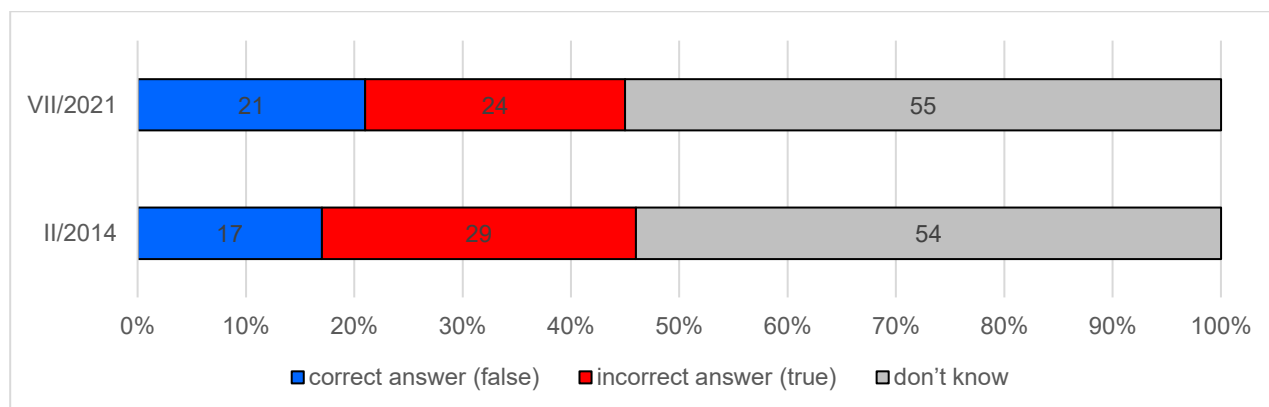
⁵ Question wording: “There is currently a plan to build a deep geological repository of radioactive waste and spent nuclear fuel in the territory of the Czech Republic. Do you find the following statements about a deep geological repository to be true or false? (a) A deep geological repository is currently the safest method of long-term disposal of high-level radioactive waste and spent nuclear fuel. (b) A deep geological repository in the Czech Republic will be put into service within ten years. (c) There are many countries in the world where a deep geological repository is already operating. (d) Only radioactive waste and spent nuclear fuel originating in the Czech Republic will be disposed of in the deep geological repository. (e) The deep geological repository will be built in a dedicated area where no communities are found. (f) A deep geological repository wouldn’t be needed if we shut down all our nuclear plants now.” Response options: true; false.

Graph 5a: Evaluation of true statement, “A deep geological repository is currently the safest method of long-term disposal of high-level radioactive waste and spent nuclear fuel” (%)



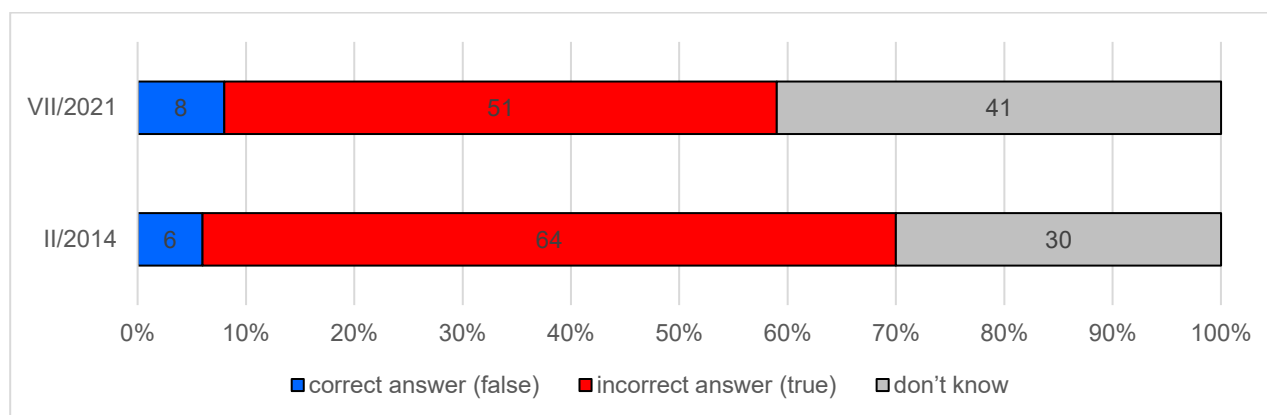
Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

Graph 5b: Evaluation of false statement, “A deep geological repository in the Czech Republic will be put into service within ten years” (%)



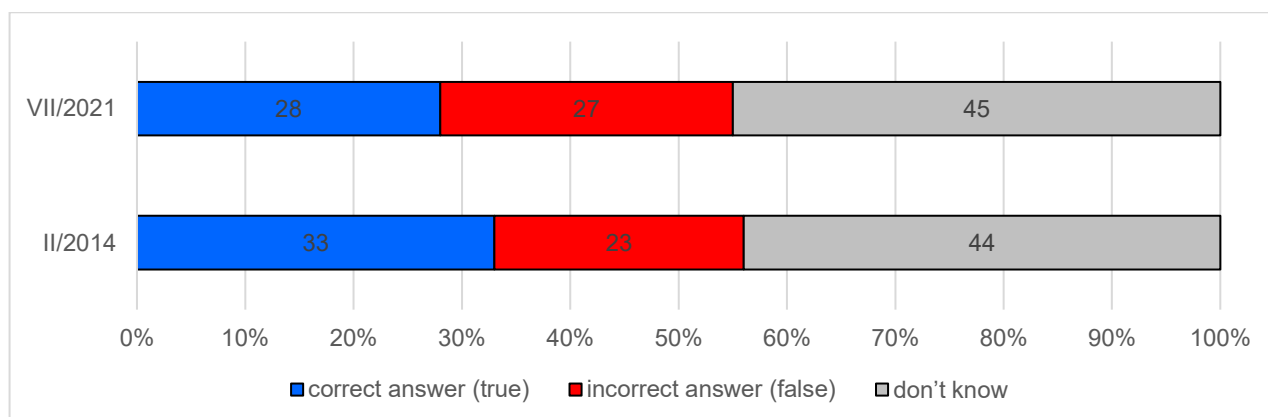
Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

Graph 5c: Evaluation of false statement, “There are many countries in the world where a deep geological repository is already operating” (%)



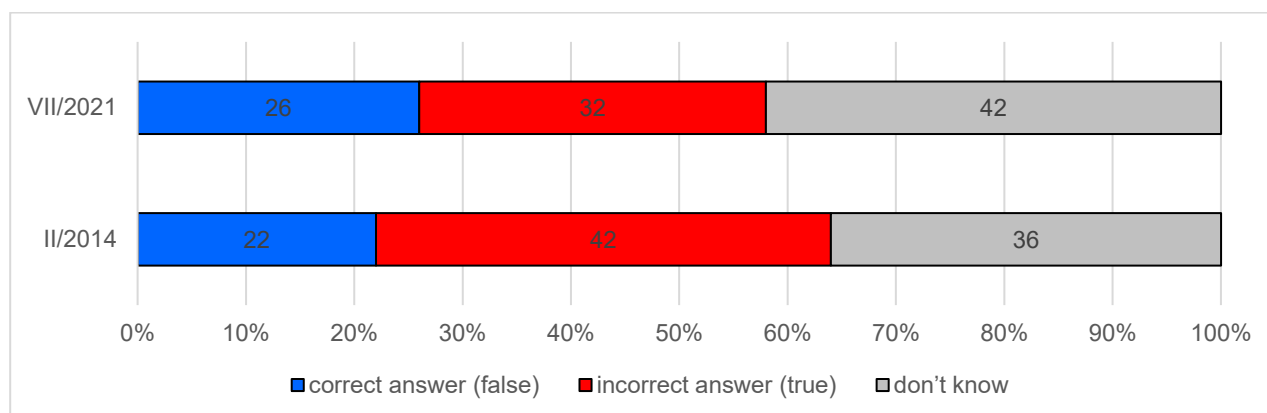
Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

Graph 5d: Evaluation of true statement, “Only radioactive waste and spent nuclear fuel originating in the Czech Republic will be disposed of in the deep geological repository” (%)



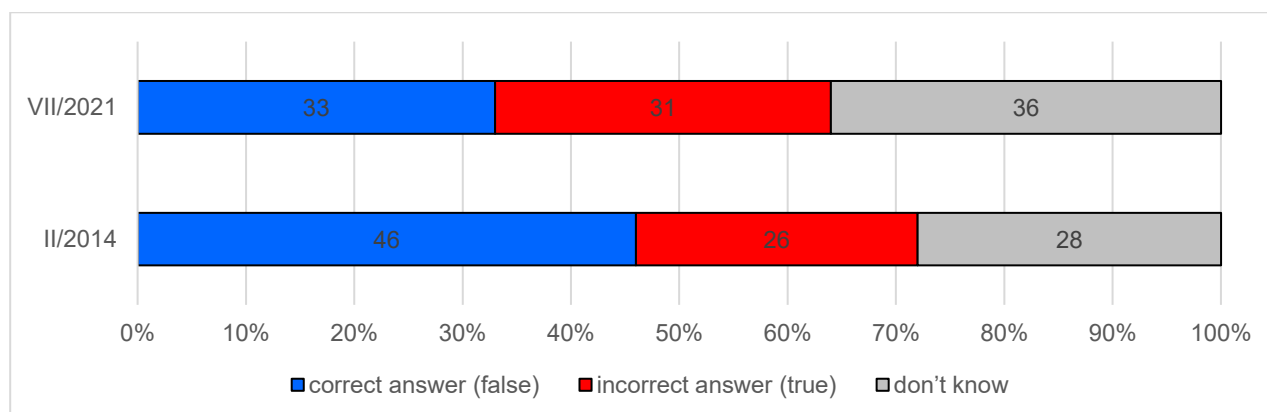
Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

Graph 5e: Evaluation of false statement, “The deep geological repository will be built in a dedicated area where no communities are found” (%)



Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

Graph 5f: Evaluation of false statement, “A deep geological repository wouldn’t be needed if we shut down all our nuclear plants now” (%)



Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

As indicated by the results in Graphs 5a through 5f, there is relatively weak awareness of the issues of deep geological repository in the Czech public. The first statement, namely that a deep geological repository is currently the safest method of long-term disposal of high-level radioactive waste and spent nuclear fuel, was correctly found true by almost every other respondent (49%). This, however, represents a 10-pp decline since the year 2014. 17% of the respondents gave incorrect answers on the statement, which is not a statistically significant increase since 2014, but there has been a statistically significant growth of “don’t knows”.

For the other statements, the shares of correct answers were at best comparable to and at times worse than those of incorrect answers, which practically indicates that the respondents’ answers were no more, but rather less, successful than in the theoretical case of purely random selection response options. As an extreme example, the statement that there are many countries in the world where a deep geological repository is already operating was correctly found false by as little as 8% of the respondents, compared to 51% who incorrectly found it true. Still, the result is somewhat better than that observed in 2014, when the share of incorrect answers was even 13 pp above the present survey, with fewer “don’t knows”.

A less pronounced but nonetheless statistically significant excess of inaccurate answers was found for another false statement, namely that the deep geological repository will be built in a dedicated area where no communities are

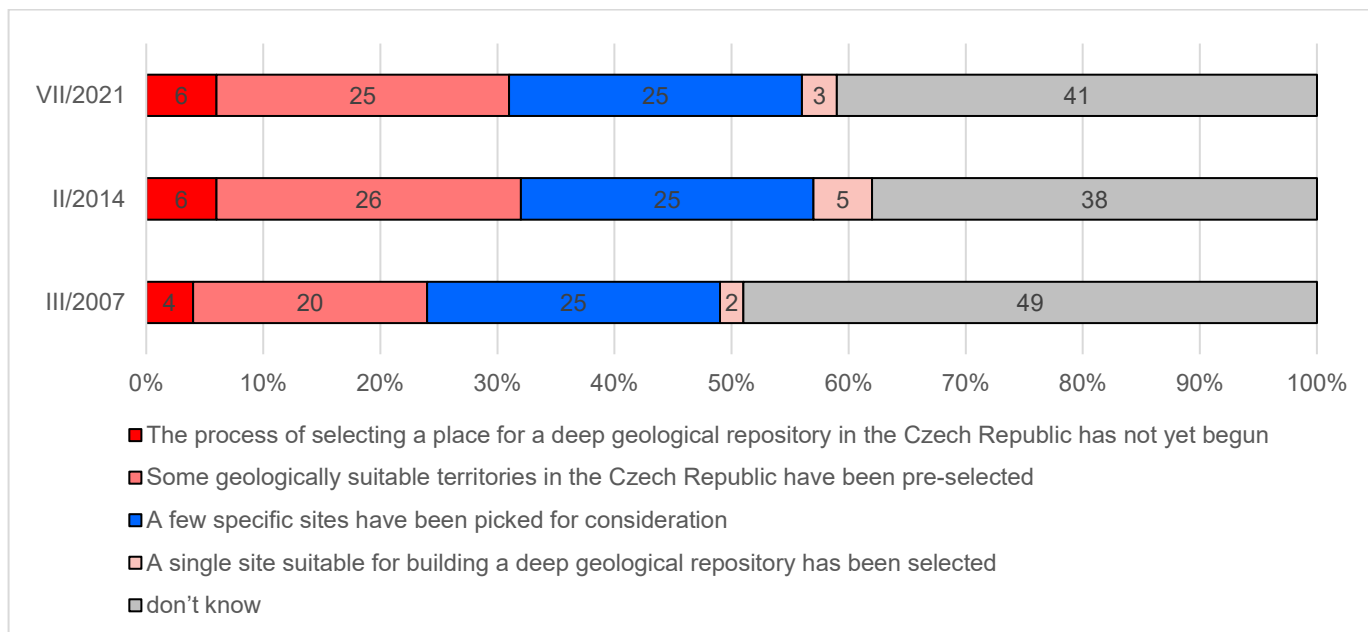
found. 26% of the respondents correctly identified the statement as false, 32% incorrectly as true, and 42% admitted they did not know. This result, too, was somewhat better than in 2014, which saw a 4 pp lower share of correct answers and a 10 pp higher share of incorrect ones, with a 6 pp lower share of “don’t knows”.

For the remaining three statements, there were equal shares of correct and incorrect answers, while most respondents were unable to decide. As for the false statement that a deep geological repository in the Czech Republic will be put into service within ten years, there was a 21% share of correct answers (4 pp more than in 2014) compared to 24% of incorrect answers (5 pp below the year 2014). The true statement that only radioactive waste and spent nuclear fuel originating in the Czech Republic will be disposed of in the deep geological repository yielded 28% of correct answers (5 pp less than in 2014), whereas the share of incorrect answers had grown 4 pp to 27% and the “don’t know” option was picked by 45%. Finally, for the factually false statement that a deep geological repository would not be needed if the country shut down all its nuclear plants now, 33% of the answers were correct and 31% incorrect, with a 36% share of “don’t knows”. This is a considerably worse result than in 2014, when there were 13 pp more correct answers, 5 pp fewer incorrect ones and 8 pp fewer “don’t knows”.

To summarise the results in terms of the number of correct answers, 29% of the respondents did not give any correct answer; more than seven in ten of these were such respondents who did not try to guess and picked the “don’t know” option in all cases. 20% of the respondents gave one correct answer; among those, only one in ten had zero incorrect answers and, in contrast, almost three in four (72%) had two or more incorrect answers. 23% of the respondents gave two correct answers, yet only a very small fraction of these (4%) had zero incorrect answers whereas three in four (75%) exhibited two or more incorrect answers. 17% of the respondents gave three correct answers, another 9% gave four. Here, too, only about 5% had zero incorrect answers, i.e. did not merely guess the correct ones. As little as 2% of the respondents answered correctly five or six times, with only three individuals in the sample knowing or guessing the right answers to all six statements studied.

The answers somewhat differed by sociodemographic characteristics. Such variability, however, does not primarily indicate different levels of knowledge across the population but rather divergent response styles found across the categories of respondents. For example, men, college graduates and those subjectively well informed about nuclear waste exhibited, on average, higher shares of both correct and incorrect answers, with rather similar margins in both cases. Men, college graduates and respondents aged 30–44 were more likely to state correctly that a deep geological repository is currently the safest method of long-term disposal of high-level radioactive waste and spent nuclear fuel; men were also more likely to state correctly that only radioactive waste and spent nuclear fuel originating in the Czech Republic will be disposed of in the deep geological repository; and college graduates more often correctly identified as false the statement that a deep geological repository would not be needed if nuclear plants were shut down now. At the same time, though, all these three categories more often incorrectly identified as true the statement that there are many countries in the world where a deep geological repository is already operating; and college graduates more often incorrectly identified as true the statement that a deep geological repository in the Czech Republic will be put into service within ten years. Proponents of nuclear energy use and those not at all concerned about its use were more likely correct on two statements: that a deep geological repository is currently the safest method of long-term disposal of high-level radioactive waste and spent nuclear fuel; and that a deep geological repository would not be needed if nuclear plants were shut down now.

Graph 6: Awareness of the stage in the deep geological repository siting process⁶



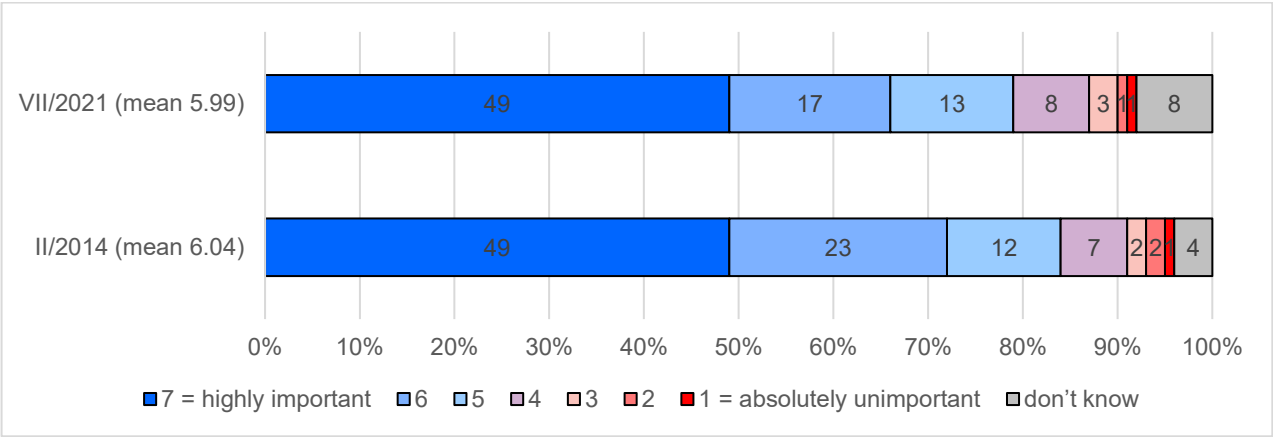
Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

As for public awareness of the present stage in the process of selecting a site for building a deep geological repository, Graph 6 presents the results of the pertinent question. Consistent with the actual situation and highlighted in blue is the third option, namely that a few specific sites have been picked for consideration. The option was picked by one in four respondents (25%), the same share as in the two previous surveys of 2007 and 2014. Practically the same frequency was also observed for the option that some geologically suitable territories in the Czech Republic have been pre-selected, again consistently with the 2014 result (compared to a 5 pp lower frequency in the year 2007). Both remaining options are relatively rare, with 6% believing that the process of selecting a place for a deep geological repository in the Czech Republic has not yet begun and only 3% believing that a single site suitable for building a deep geological repository has been selected. Neither of these results is significantly different from those of the two previous surveys. “Don’t know” was by far the most frequently picked option. Whereas almost one in two respondents were undecided in 2007, the subsequent surveys have seen a decline of the share of “don’t knows” to around two-fifths, with a present share of 41%.

Detailed analysis reveals that men, those in favour of increasing the share of nuclear energy, those not at all concerned about nuclear energy use, those subjectively very or rather well informed about radioactive waste, and those who stated correctly that spent fuel and radioactive waste are being stored temporarily in the country more often selected the correct option, namely that a few specific sites have been picked for consideration (albeit those “rather well informed” were also considerably more likely to state that some geologically suitable territories in the Czech Republic have been pre-selected). This correct option was also more often picked by those who believe that today’s Czech society itself should actively tackle the problem of spent nuclear fuel and high-level radioactive waste.

⁶ Question wording: “As for the process of selecting a suitable site for a deep geological repository of spent nuclear fuel and other high-level radioactive waste in the Czech Republic, at what stage do you think it is at the moment? (a) The process of selecting a place for a deep geological repository in the Czech Republic has not yet begun. (b) Some geologically suitable territories in the Czech Republic have been pre-selected. (c) A few specific sites have been picked for consideration. (d) A single site suitable for building a deep geological repository has been selected.”

Graph 7: Importance of the deep geological repository siting decision for the Czech society (%)⁷



Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

The next question focused on the importance for Czech society ascribed to the deep geological repository siting decision, as measured on a seven-point scale from 1 to 7 where category 1 refers to “absolutely unimportant” and 7, on the other hand, “highly important”. As indicated by the results in Graph 7, the most respondents by a wide margin (almost one in two) picked the extreme category 7, i.e. maximum importance. The mean score came one-hundredth point close to the value 6, practically equal to the year 2014 score of 6.05. Since 2014, there has been only a slight (4-pp) increase of “don’t knows” and a decrease in category 6. Other values are statistically comparable.

There were no significant sociodemographic differences on this question, except for the share of “don’t knows”, which exhibited marked differences in some bivariate analyses, e.g. with subjective level of information on nuclear waste.

The next question focused on how people think the building and operation of a deep geological repository might affect or benefit the community involved. The respondents were presented with a card listing the possible positive benefits as well as limitations and problems associated with the deep geological repository’s building and operation (see Figure 1) and asked which would prevail from the perspective of the community involved.⁸

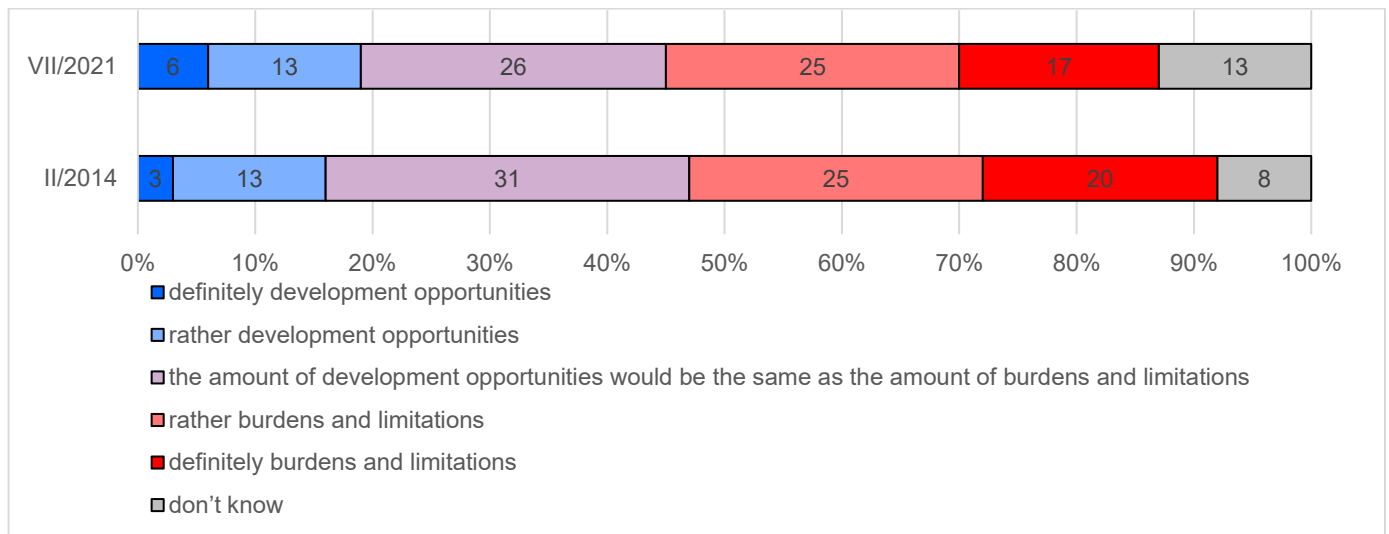
Figure 1: Showcard presented to respondents to accompany the question:

DEVELOPMENT OPPORTUNITIES	BURDENS AND LIMITATIONS
advantages provided by government	extensive construction activity
job opportunities	the operation of the repository itself
the technological prestige of the structure	the handling of spent nuclear fuel
being respected by society for taking responsibility for building the repository	the disposal of spent nuclear fuel in the ground

⁷ Question wording: “How important for the Czech society is the decision on where to build a deep geological repository of radioactive waste and spent nuclear fuel? Please answer on a scale from 1 to 7 where 1 means absolutely unimportant and 7 means highly important.” Response options: 1 = absolutely unimportant to 7 = highly important.

⁸ Question wording: “For a community located near a deep geological repository, its building and operation would result in both opportunities for development and burdens and limitations, as shown on the card. There would be development opportunities in terms of advantages provided by government, job opportunities, the technological prestige of the structure, and being respected by society for taking responsibility for building the repository. In contrast, there would be burdens and limitations due to extensive construction activity, the operation of the repository itself, the handling of spent nuclear fuel, and the disposal of that fuel in the ground. Considering all these facts, would the building and operation of a deep geological repository mean development opportunities or burdens and limitations for the nearby community?” Response options: definitely development opportunities; rather development opportunities; the amount of development opportunities would be the same as the amount of burdens and limitations; rather burdens and limitations; definitely burdens and limitations.

Graph 8: Perceived effects of the deep geological repository's building and operation on the community involved (%)

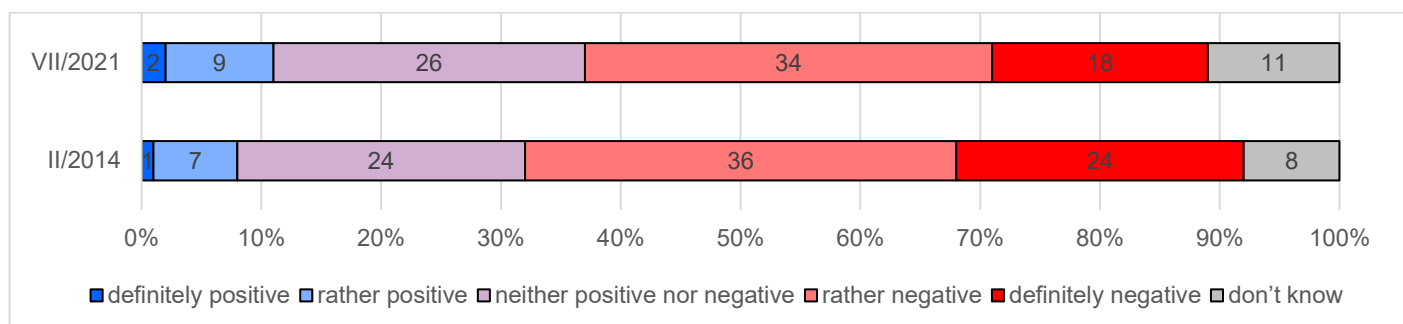


Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

The information in Graph 8 indicates that potential negative community effects of the deep geological repository's building and operation are perceived more strongly by the public than positive effects. Overall, more than two in five respondents (42%) believe the building and operation of a deep geological repository would entail burdens and limitations to the community, while fewer than one in five (19%) think it would mean opportunities for development. In addition, though, more than one in four (26%) do not lean to either side and believe that the amount of development opportunities would be balanced by the amount of burdens and limitations. Although optimistic expectations are in the minority, people's evaluations are clearly not black-and-white and there is an apparent tendency in the Czech public to perceive the opportunities of the deep geological repository's building as well. At the same time, the current result is not much different from the previous survey. Compared to 2014, we now have a 5 pp lower share of those who believe that the amount of development opportunities is comparable to that of burdens and limitations, accompanied by a 5 pp lower share of "don't knows"

Detailed analysis reveals that men, those in favour of increasing the proportion of nuclear energy in electricity production in future, those not at all concerned about nuclear energy use, and those subjectively well informed about radioactive waste are more likely to perceive the development opportunities of the deep geological repository's building and operation.

Graph 9: Perceived effects of the deep geological repository's building and operation on people living in its vicinity (%)⁹



Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

The results in Graph 9 indicate how people evaluate the possible effects of the building and operation of a deep geological repository on residents in its immediate vicinity. Compared to the communities involved, these perceptions appear to be more pessimistic, with only about one in ten respondents (11%) viewing such effects positively, about one in four (26%) neutrally and more than half (52%) negatively. Importantly, there has been an 8-pp growth of negative perceptions since the year 2014.

Once again, the respondents who perceive the effects of the deep geological repository's building and operation in more favourable terms include men, those in favour of nuclear energy use not at all concerned about nuclear energy use, those subjectively well informed about radioactive waste, and of course, in the previous question, those who perceived the development opportunities of the deep geological repository's building and operation; there is indeed a strong correlation between both questions on the effects of the building and operation of a deep geological repository.¹⁰

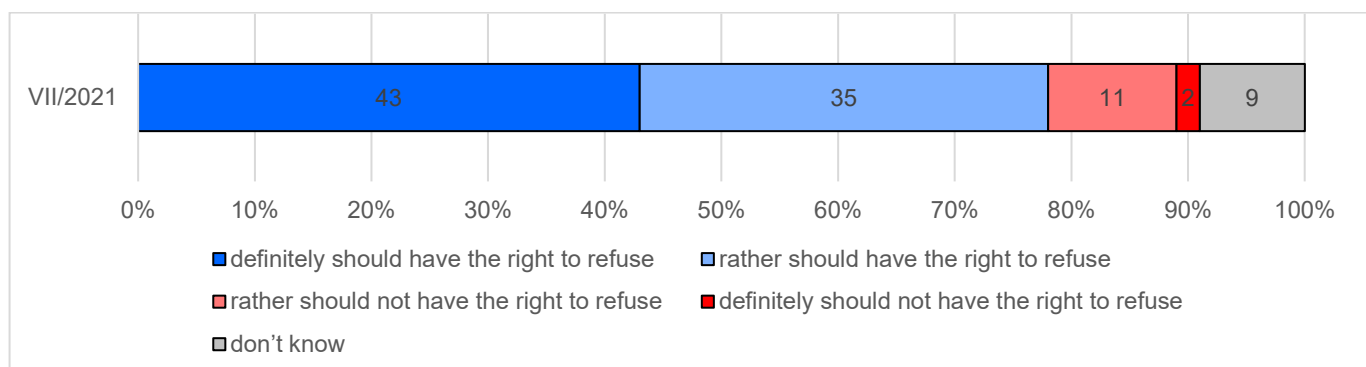
The above questions on the effects of the deep geological repository's building and operation were followed up by a question on whether the municipalities involved should have the right to refuse the building of a deep geological repository in their territory.¹¹

⁹ Question wording: "Overall, what kind of effects on the people living nearby do you think the building and operation of a deep geological repository will have? They will be:" Response options: definitely positive; rather positive; neither positive nor negative; rather negative; definitely negative.

¹⁰ Spearman's rank correlation coefficient between the two questions amounts to 0.644.

¹¹ Question wording: "As for the municipalities in whose territory a deep geological repository would be planned, should they or should they not have the right to refuse the building of the repository? The municipalities definitely should have the right to refuse, rather should have the right to refuse, rather should not have the right to refuse, definitely should not have the right to refuse."

Graph 10: The right of municipalities to refuse the building of a deep geological repository in their territory (%)



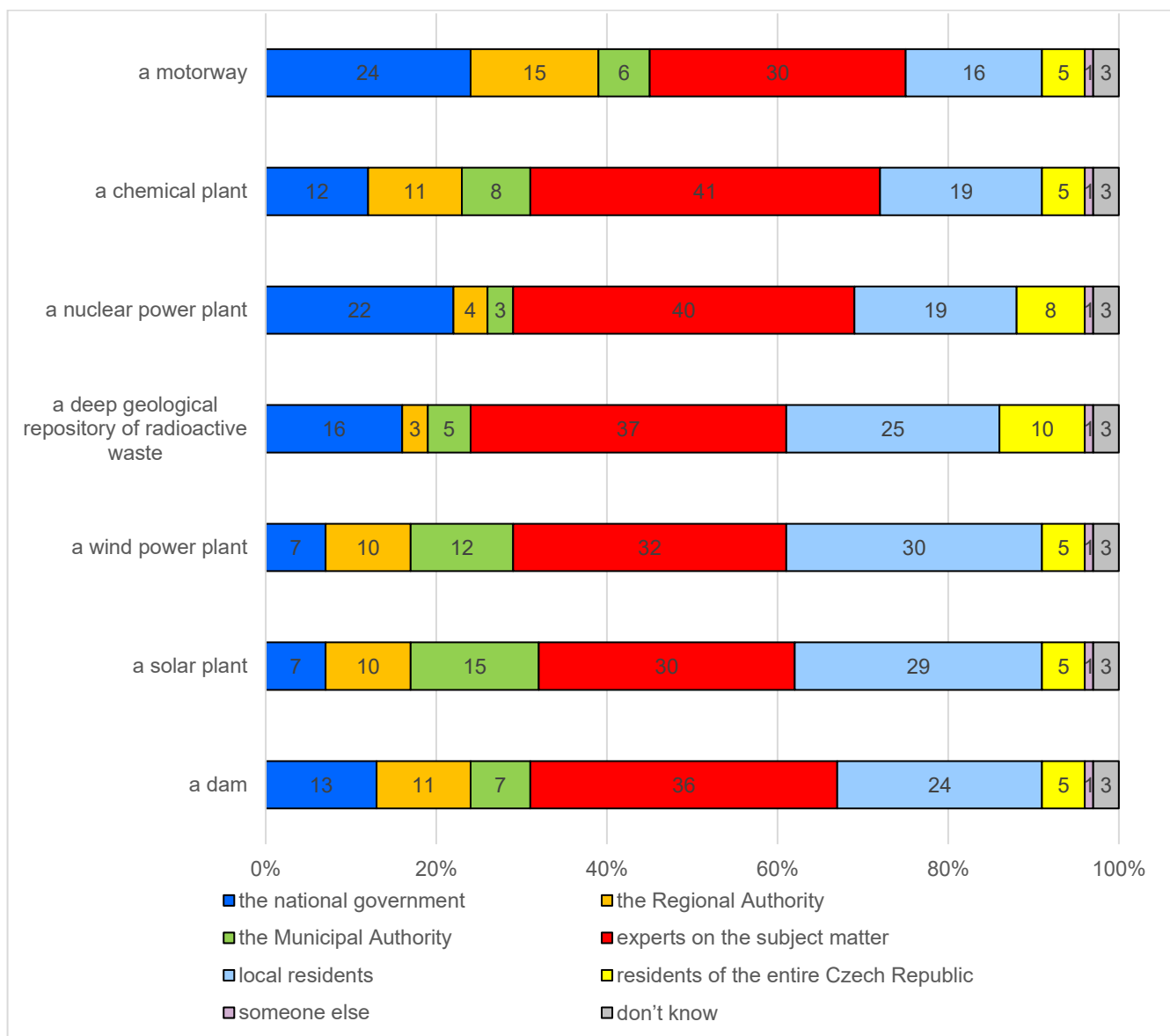
Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

The results in Graph 10 clearly indicate that a substantial majority of more than three-fourths (78%) of the Czech population believe that municipalities should have the right to refuse a plan to build a deep geological repository in their territory, including 43% definitely and 35% rather so. Only 13% of the public think municipalities should have no such right. The remaining respondents, just under one in ten (9%), were unable to decide.

Despite overwhelming support for the right of local jurisdictions to refuse such building plans, there are once again statistically significant sociodemographic differences. Men, college graduates, people who think that the proportion of nuclear energy should increase in future, those not concerned about nuclear energy use, those subjectively well informed about radioactive waste, and those emphasising positive effects of a deep geological repository's building and operation on the communities involved and people living in its vicinity are more likely opposed to such right of local jurisdictions.

The entire thematic section of questions on issues of a deep geological repository of nuclear waste, as mentioned and analysed above, was preceded by two questions related to the topic and focusing (1) on who should decide on the deep geological repository's building and (2) on whether the region in which a deep geological repository would be built should subsequently obtain any advantages. To facilitate comparison and for methodological reasons, to reduce the risk of any halo effect, both these questions "concealed" the deep geological repository within seven-item batteries that also included a motorway, a chemical plant, a nuclear power plant, a wind power plant, a solar plant, and a dam.

Graph 11: Who should decide on the building of selected facilities (%)¹²



Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

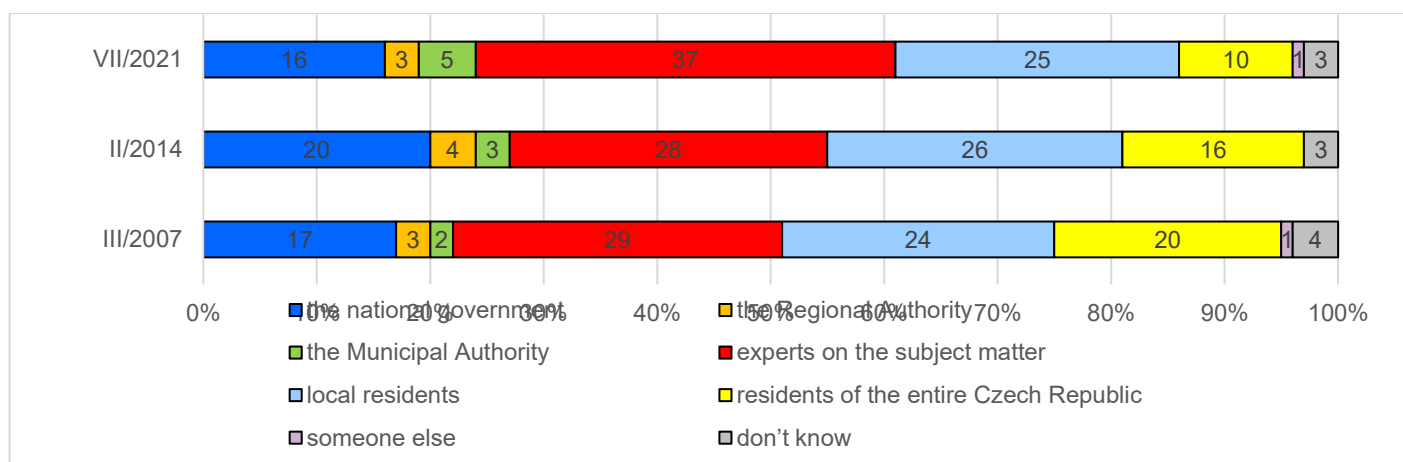
As indicated by the results in Graph 11, there is a general tendency to leave the decision making to experts on the subject matter, albeit in the case of solar and wind power plants, those in favour of expert decisions do not significantly outnumber those emphasising the role of local residents. The latter generally rank second, except the cases of motorways and nuclear power plants, where they rank third following national government. There are considerable differences in the shares of those in favour of national government taking the decisions: besides the above two second-ranking items where that share approximates one-fourth, the national government clearly ranks third in the very case of deep geological repository and also third, by a narrow margin, in the case of chemical plants and dams. In the contrasting cases of wind and solar power plants, the national government ranks fifth, trailing local and regional governments, with a share below one-tenth. Regional Authorities rank fourth, by a narrow margin, in the case of

¹² Question wording: "Who do you think should primarily decide on whether the following should be built at a given site: (a) a motorway, (b) a chemical plant, (c) a nuclear power plant, (d) a deep geological repository of radioactive waste, (e) a wind power plant, (f) a solar plant, (g) a dam?" Response options: the national government, the Regional Authority, the Municipal Authority, experts on the subject matter, local residents, residents of the entire Czech Republic, someone else.

motorways, chemical plants and dams; they lag behind local governments in the above-mentioned case of wind and solar plants, although still with a share of one-tenth; they and local governments rank fifth and sixth, respectively, in the cases of nuclear plants and a deep geological repository of nuclear waste, with minimum shares, since these two items exhibit increased preference for the right of the country's residents to decide in a referendum. In other cases, this decision-making option consistently ranked sixth, with a stable 5% share of proponents, who largely preferred the option on all or at least most items. The option of "someone else" taking the decision occurred sporadically, at the level of 1%, and "don't knows" accounted for 3% on all items.

When looking at the deep geological repository of nuclear waste alone and comparing it with the most similarly evaluated option of nuclear power plant, one can discern a clear plurality in favour of expert decision making, which accounts for about two-fifths in both cases (37% for deep geological repository and 40% for nuclear plant). The nuclear plant item exhibits a somewhat wider margin between the experts and the second-ranking national government (22%), whereas in the case of deep geological repository, local people rank second (25%) and the national government is third by a relatively considerable margin (with a share of as little as 16%). Lagging by a large margin is, in both cases, the fourth-ranking option of residents of the entire Czech Republic taking the decision. There is only marginal preference for decision making by regional or local governments; while local governments are slightly more strongly preferred than regional governments in the case of deep geological repository, the order is reversed for nuclear plants, although the differences are not statistically significant. The relatively strong emphasis placed on local jurisdictions in the case of such a strategic decision of national importance (local people and local governments have a combined share of 30%) is basically in line with the clearly prevailing opinion that municipalities should have the right to refuse the building of a deep geological repository of nuclear waste in their territory, although most respondents simultaneously realise the importance and necessity of taking that decision. This represents the contradiction of the well-known NIMBY effect that has been consistently hampering the building effort.

Graph 12: Who should decide on the building of a deep geological repository of nuclear waste, time comparison (%)



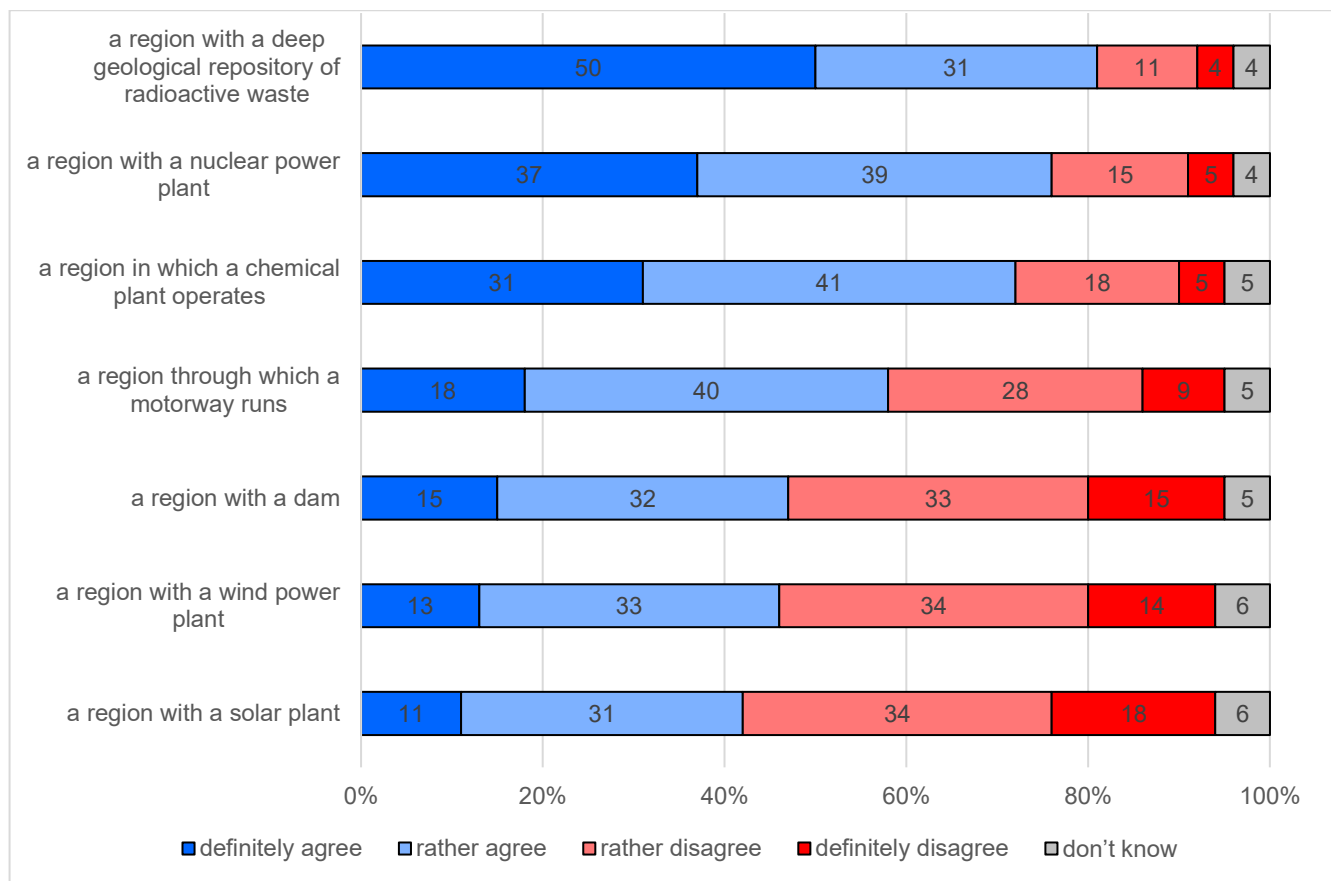
Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost).

Graph 12 shows the development of opinions on who should decide on building a deep geological repository using a time comparison with the previous surveys of 2007 and 2014. Compared to both those surveys, we have measured stronger support for decision making by experts on the subject matter and weaker support for decision making by residents of the entire Czech Republic. Current support for decision making by national government is slightly weaker than in 2014 but fully on par with the year 2007.

Detailed analysis reveals that people aged 60+, those not at all concerned about nuclear energy use, and those in favour of increasing the proportion of nuclear energy in electricity production are more likely to support decision making by national government. Experts on the subject matter are more often preferred by people younger than 30 years and those who believe that today's Czech society itself should take care of solving the radioactive waste problem. Those with clearly negative perceptions of the effects of the building and operation of a deep geological repository of radioactive waste on the communities involved and on residents in the vicinity are more likely to support

decision making by local people or residents of the entire Czech Republic, which comes strongly at the expense of the share of national government and experts. This is similarly the case of those clearly in support of the right of municipalities to refuse the building of a deep geological repository in their territory.

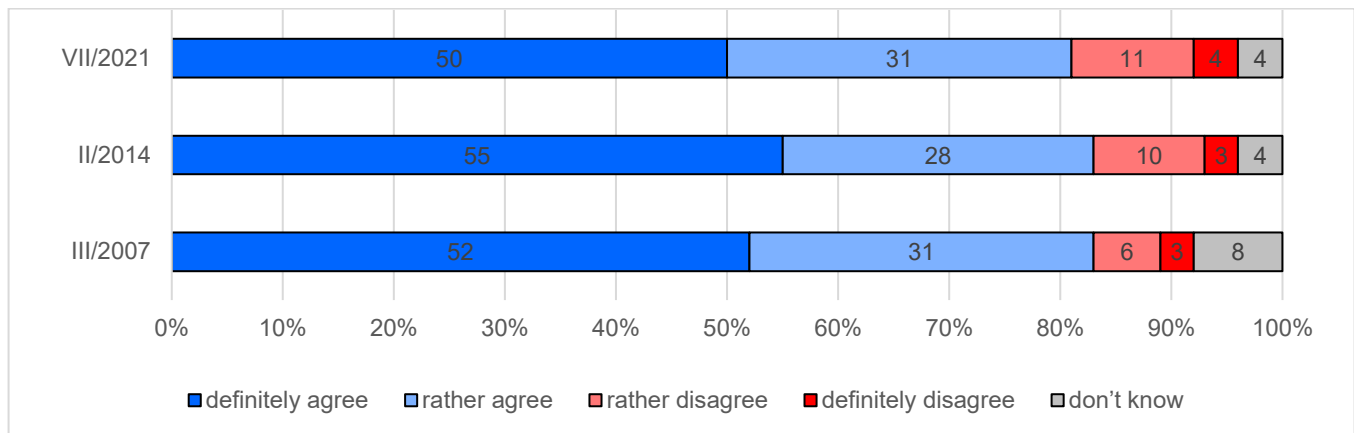
Graph 13: Advantages to be enjoyed by regions with burdensome facilities (%)¹³



Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost), June 26 – July 11, 2021, 904 respondents aged 15 and over, face-to-face interviews.

¹³ Question wording: "Should a region that has the following facilities in its territory enjoy any special advantages? (a) a region through which a motorway runs, (b) a region in which a chemical plant operates, (c) a region with a nuclear power plant, (d) a region with a deep geological repository of radioactive waste, (e) a region with a wind power plant, (f) a region with a solar plant, (g) a region with a dam." Response options: definitely agree, rather agree, rather disagree, definitely disagree.

Graph 14: Advantages to be enjoyed by a region with a deep geological repository of nuclear waste, time comparison (%)



Source: Public Opinion Research Centre, Institute of Sociology CAS (CVVM SOÚ AV ČR, v.v.i.), Czech Society (Naše společnost).

The results in Graph 13 indicate that the overwhelming majority of more than four-fifths (81%) of the Czech society support any advantages that might be granted to a region burdened by the deep geological repository of nuclear waste, whereas one-half strongly agree. This represents the highest level and strongest intensity of support of all items studied; nuclear power plant is the only item with a similarly high level of support (76%), but this only includes 37% of the respondents who strongly agreed. 72% agree that the third-ranking item, a chemical plant, should warrant regional advantages, and 58% agree in the case of a motorway. The remaining three items yielded levels of support under 50%, and especially in the case of solar plants, those who agreed (42%) were significantly outweighed by those opposed to regional advantages.

A time comparison of support for granting advantages to a region burdened by the deep geological repository (see Graph 14) attests to relatively stable support. Since 2007, the share of those who disagree with advantaging the deep geological repository region has slightly grown at the expense of “don’t knows”.

Detailed analysis has not revealed any statistically significant sociodemographic differences in support for potential advantages for a region burdened by the building and operation of a deep geological repository of nuclear waste. Higher levels of support for advantaging the deep geological repository region were found among those who believe that today’s Czech society itself should respond to the radioactive waste problem and those with strongly negative perceptions of the potential effects of a deep geological repository’s building and operation on the communities involved and local people.

Technical parameters of the survey

Survey:	<i>Czech Society, v21-07</i>
Survey by:	<i>Public Opinion Research Centre, Institute of Sociology, Czech Academy of Sciences</i>
Project:	<i>Czech Society – Continuous Public Opinion Research Project of the Public Opinion Research Centre, Institute of Sociology, Czech Academy of Sciences</i>
Survey dates:	<i>June 26 – July 11, 2021</i>
Sampling method:	<i>Quota sampling</i>
Quotas:	<i>Region (NUTS 3 Regions), size of place of residence, sex, age, education</i>
Data weighting:	<i>Education × NUTS 2, age × NUTS 2, sex × region, age × education, age × size of place of residence</i>
Data source for quota sampling and weighting:	<i>Czech Statistical Office</i>
Representativeness:	<i>Population of the Czech Republic aged 15+</i>
Number of respondents:	<i>904</i>
Number of interviewers:	<i>139</i>
Data collection method:	<i>Face-to-face interviews conducted by interviewers with respondents – mixed CAPI and PAPI methods</i>
Research instrument:	<i>Standardised questionnaire</i>
Questions:	<i>US.1, US.2, EB.1, UN.2. US.3, US.4, UN.4, US.5, UN.5, UN.6, UN.7, UN.8</i>
Press release no.:	<i>oe211119c_en</i>
Published on:	<i>19 November 2021</i>
Prepared by:	<i>Jan Červenka, Martin Ďurdovič</i>

Glossary of terms:

A quota sample replicates the structure of the basic population of the study (in this case the population of the Czech Republic aged 15+) by setting quotas for different parameters. In other words, a quota sample is based on the same proportion of persons with the selected characteristics. We used data from the Czech Statistical Office to create the quotas. In our surveys, quotas are set for sex, age, education, region, and community size. The sample is thus selected so that the percentage of men and women in the sample, for instance, corresponds to the share of men and women in each region of the CR. Similarly, the sample reflects the corresponding shares of the population in individual regions in the CR, citizens in different age groups, people with different levels of educational attainment, and people in different sizes of communities.

A representative sample is a sample of the total population whose characteristics can be validly inferred to apply as the characteristics of the population overall. In our case, this means that respondents were selected with a view to generalising the collected data as applicable to the population of the Czech Republic aged 15 and over.

Data weighting – a method of increasing representativeness in terms of selected population characteristics by assigning a weight to each respondent. Calculated by the method of iterative proportional fitting, the weights range between 0.333 and 3.

The Public Opinion Research Centre (CVVM) is a research department of the Institute of Sociology, Czech Academy of Sciences. It dates back to 1946, when the Czechoslovak Institute for Public Opinion Research began operating as part of the Ministry of Information. The current CVVM emerged in 2001 when its predecessor (IVVM) was transferred from the Czech Statistical Office to the Institute of Sociology. Its incorporation within an academic institution provides a guarantee of high professional standards and quality, and as part of an academic environment, the CVVM is required to fulfil criteria that ensure it meets the highest professional standards. The CVVM's work is centred on the Czech Society research project, under which it examines public opinion by conducting ten surveys annually on a representative sample of the population over the age of 15, with approximately 1000 respondents participating in each survey. The questionnaire's omnibus format makes it possible to cover a wide array of topics. Political, economic, and other general social topics are regularly covered by the survey. The surveys include both repeat questions, whereby it is possible to observe phenomena over time, and new topics that reflect current events. The long-term and continuous nature of this public opinion survey project is unique in the Czech Republic.

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