



the gandalf group

Ontario Power Generation

Deep Geologic Repository Study

April 2016



On behalf of Ontario Power Generation, the Gandalf Group conducted a survey among 805 Ontarians with the goal of understanding how the public feels about a proposed Deep Geologic Repository. This report discusses findings from that survey.

Interviews were completed between April 14 and 29, 2016. The margin of error is $\pm 3.45\%$, 19 times out of 20. Data is weighted to represent the gender, age, and regional distribution of the province.

Reporting has been done on the following sub populations. Note that only statistically significant differences are discussed.

	Male	Female	<35	35-44	45-54	55-64	65+
n=	420	385	167	140	200	141	157
MOE	$\pm 4.8\%$	$\pm 5\%$	$\pm 7.6\%$	$\pm 8.3\%$	$\pm 6.9\%$	$\pm 8.3\%$	$\pm 7.8\%$

	Central	East	GTA	Niagara	North	Southwest	Toronto
n=	50	115	198	78	45	145	174
MOE	$\pm 13.9\%$	$\pm 9.1\%$	$\pm \%$	$\pm 7\%$	$\pm 14.6\%$	$\pm 8.1\%$	$\pm 7.4\%$



Additionally, reporting is done on *Involved Canadians* – the Gandalf Group’s proprietary segment, which includes those that are most engaged with public affairs issues. Essentially, these are the people that are most likely to make their voice heard in favour of, or in opposition to, government or industry actions.

1 in 3 respondents are *Involved Canadians* (n=269), yielding a margin of error of $\pm 6\%$. *Involved Canadians* are:

- Proportionate to the regional and gender distribution of the province, but are
- Skewed older, with 62% being older than 45, compared to 51% of the *Uninvolved*.

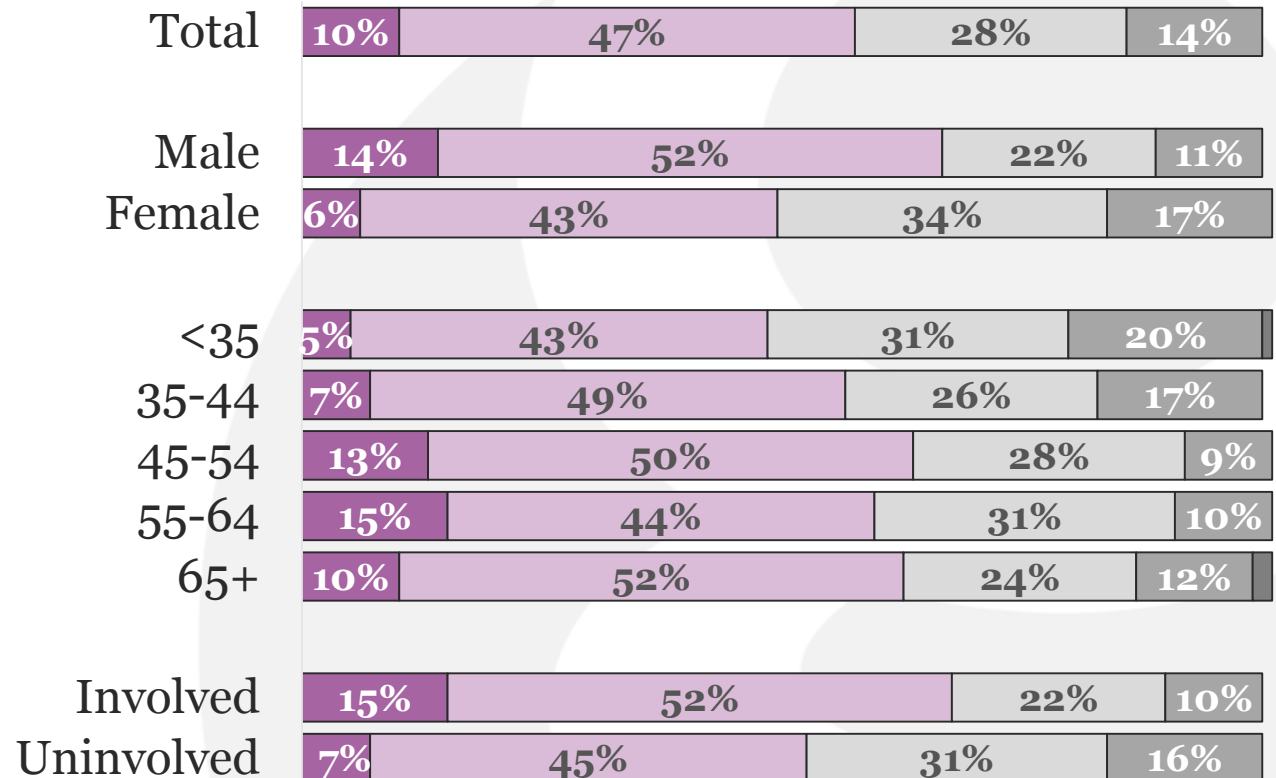


Just over half (57%) of Ontarians say that they are at least somewhat familiar with the roles and responsibilities of OPG – although only 10% consider themselves to be very familiar.

- Men, Ontarians older than 45, and Involved Ontarians report being most familiar with OPG.



And how familiar are you with the roles and responsibilities of Ontario Power Generation, or OPG? Would you say you are very familiar, somewhat familiar, not very familiar or not at all familiar?



■ Very familiar ■ Somewhat familiar ■ Not very familiar ■ Not at all familiar ■ Don't know



OPG is moderately favourably viewed by most Ontarians.

Just over one quarter of Ontarians have a very favourable view and an equal number have a very unfavourable view.

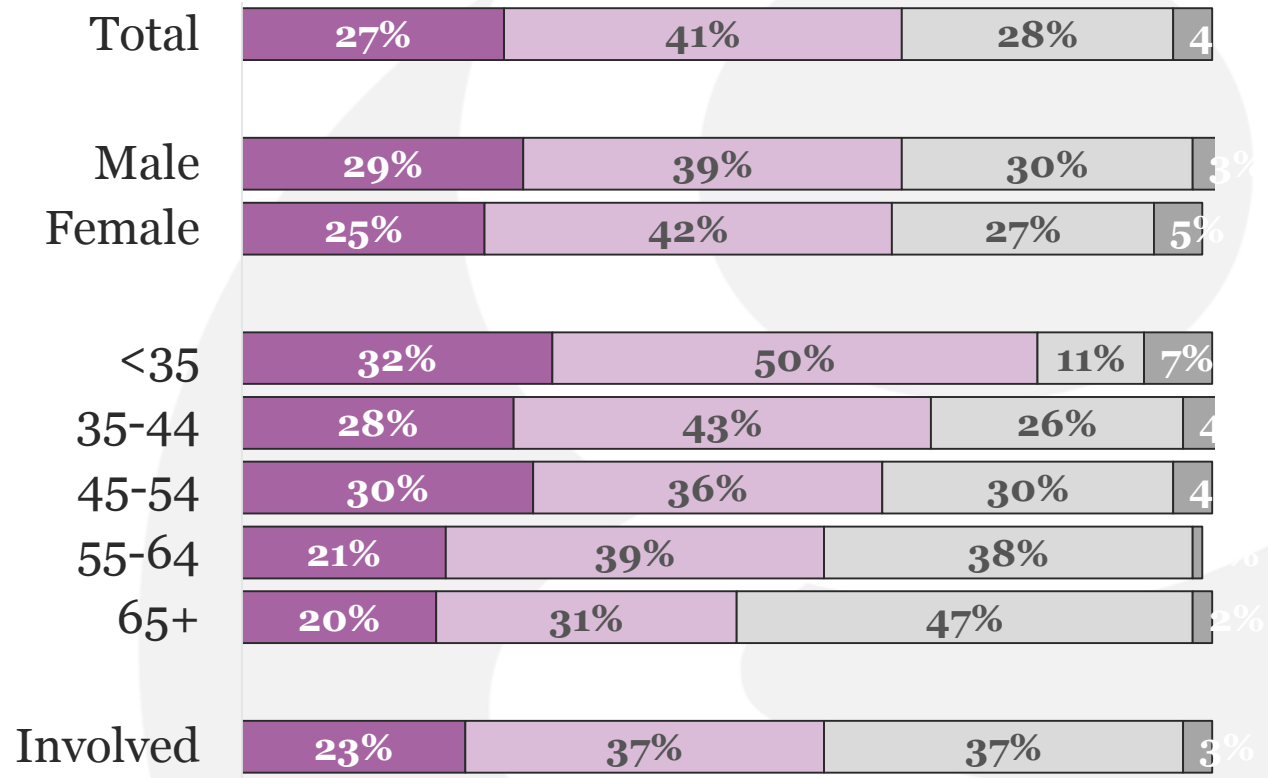
Among Involved Ontarians, impressions of OPG are dangerously unfavourable - 37% have a very unfavourable view compared to just 23% who have a very favourable view.

The issue with Involved Ontarians is largely age related. Impressions of OPG are much poorer among older Ontarians (regardless of Involved status).

Those living in the GTA and Southwest Ontario have the most positive view of OPG.



How favourable is your view of Ontario Power Generation, or OPG? Please tell me using a scale of one to nine where one means very unfavourable and nine means very favourable.

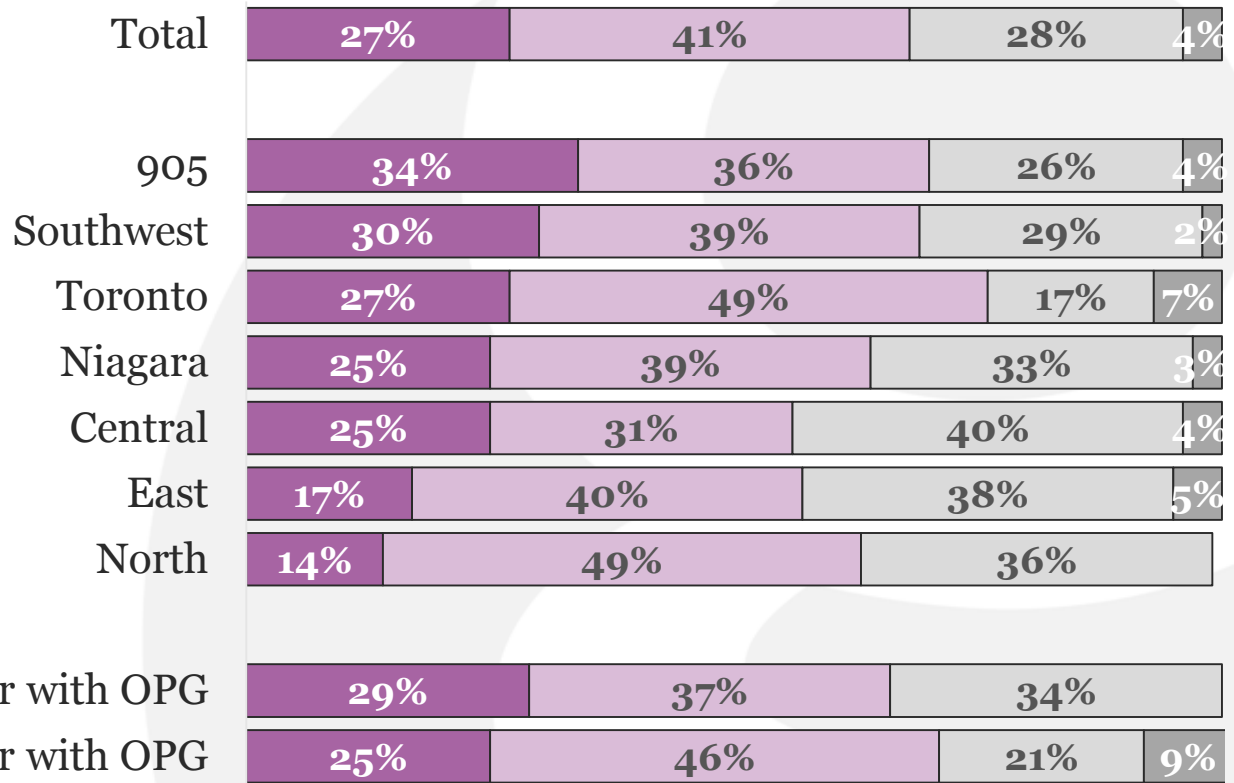


■ Very favourable (7-9) ■ Somewhat favourable (4-6) ■ Very unfavourable (1-3) ■ Don't know



OPG: Favourability

How favourable is your view of Ontario Power Generation, or OPG? Please tell me using a scale of one to nine where one means very unfavourable and nine means very favourable.



■ Very favourable (7-9) ■ Somewhat favourable (4-6) □ Very unfavourable (1-3) ■ Don't know



Nearly half (47%) of Ontarians could not name any OPG projects.

Two areas of investment are most likely to be mentioned:

- Investments in nuclear energy (17%)
- Alternative/renewable energy projects, such as wind, solar, and biomass (18%)

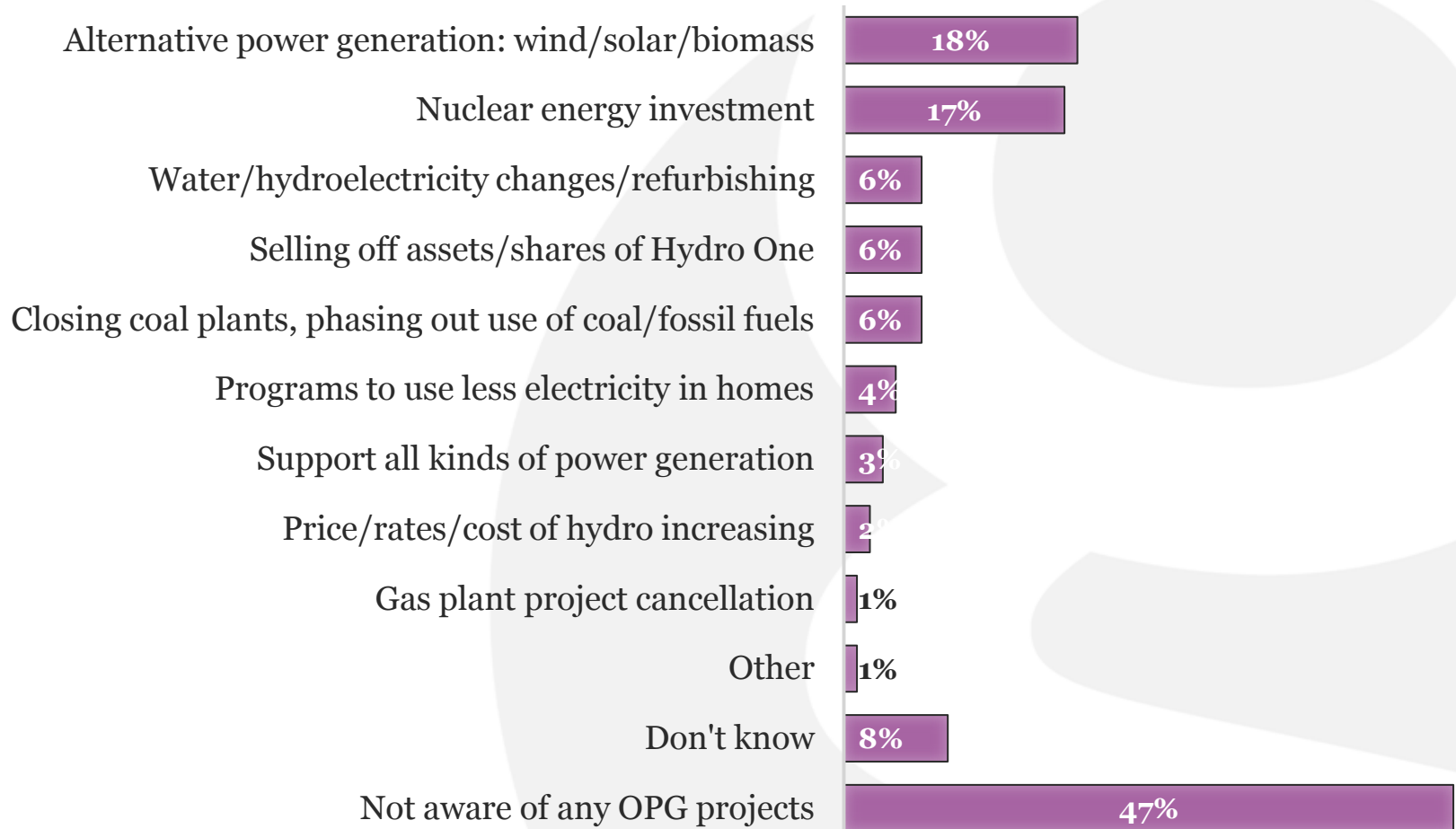
Alternative energy projects were mentioned most often by rural Ontarians (28%) compared to just 18% of suburban Ontarians, and 14% of those from urban communities.

Nuclear projects were more frequently mentioned by:

- Men (23%) compared to women (12%)
- Residents in Southwestern Ontario (18%), Toronto (19%), and the 905 belt (22%)
- Involved Ontarians (22%) compared to just 15% of the Uninvolved



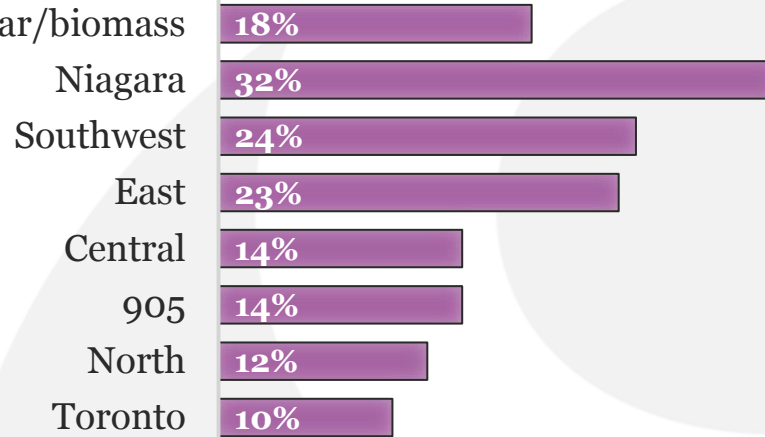
What, if any, current or proposed OPG projects are you aware of? Please list as many as come to mind.



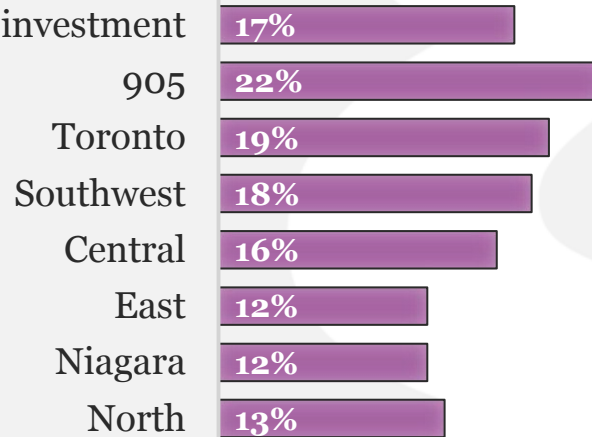


What, if any, current or proposed OPG projects are you aware of? Please list as many as come to mind.

Alternative power generation: wind/solar/biomass



Nuclear energy investment





Support for Nuclear Energy

7 in 10 Ontarians are supportive of using nuclear energy to produce electricity.

- This level of support is constant from September 2014.

Men are significantly more supportive (81%) than women (60%).

- There is an even larger gender difference in the intensity of support. While 43% of men strongly support the nuclear generation of electricity just 16% of women strongly support it and an equal number strongly oppose it. Most women either somewhat support nuclear energy (43%) or somewhat oppose it (20%).

Despite poorer impressions of OPG, older Ontarians and Involved Ontarians are very supportive of nuclear energy.

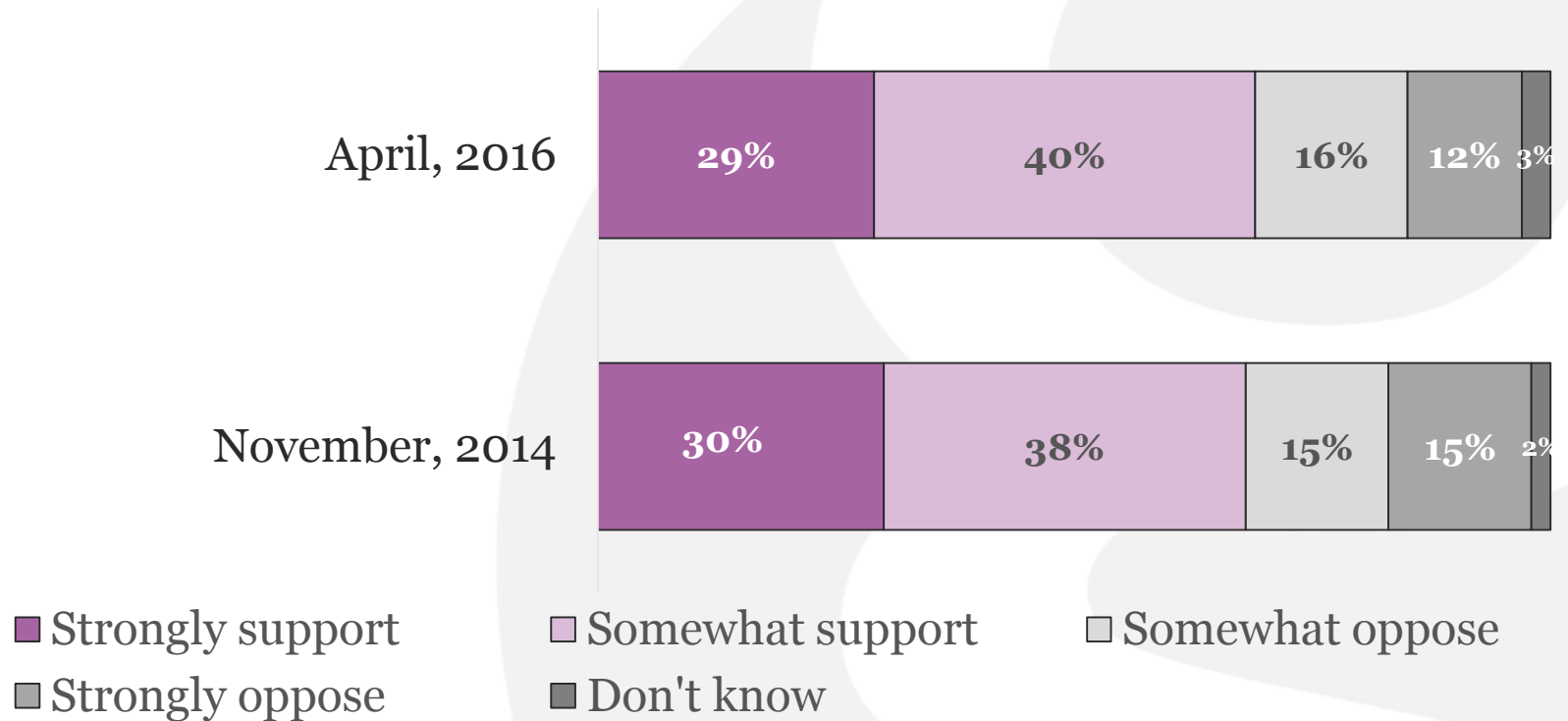
The most common reason for supporting the use of nuclear energy is that it is better for the environment (56%), followed by it being reliable and efficient (32%), and a cheap source of electricity (24%).

Most common reasons for opposing nuclear are safety concerns (51%) and environmental risks (24%).



Support for Nuclear Energy

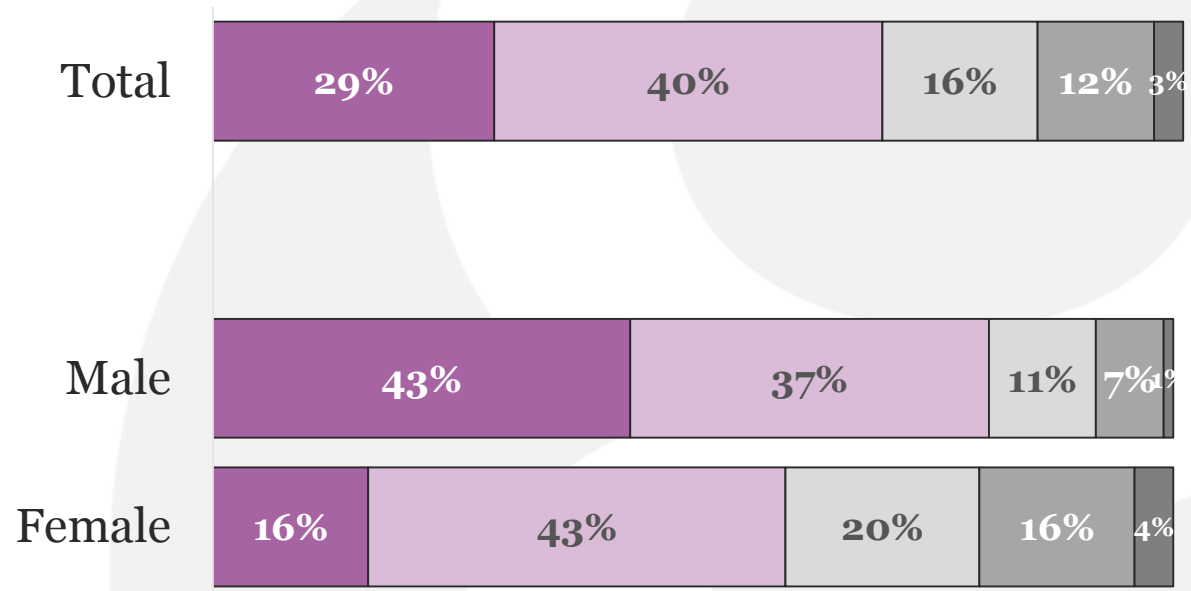
Do you strongly support, somewhat support, somewhat oppose, or strongly oppose using nuclear energy to produce electricity?





Support for Nuclear Energy

Do you strongly support, somewhat support, somewhat oppose, or strongly oppose using nuclear energy to produce electricity?

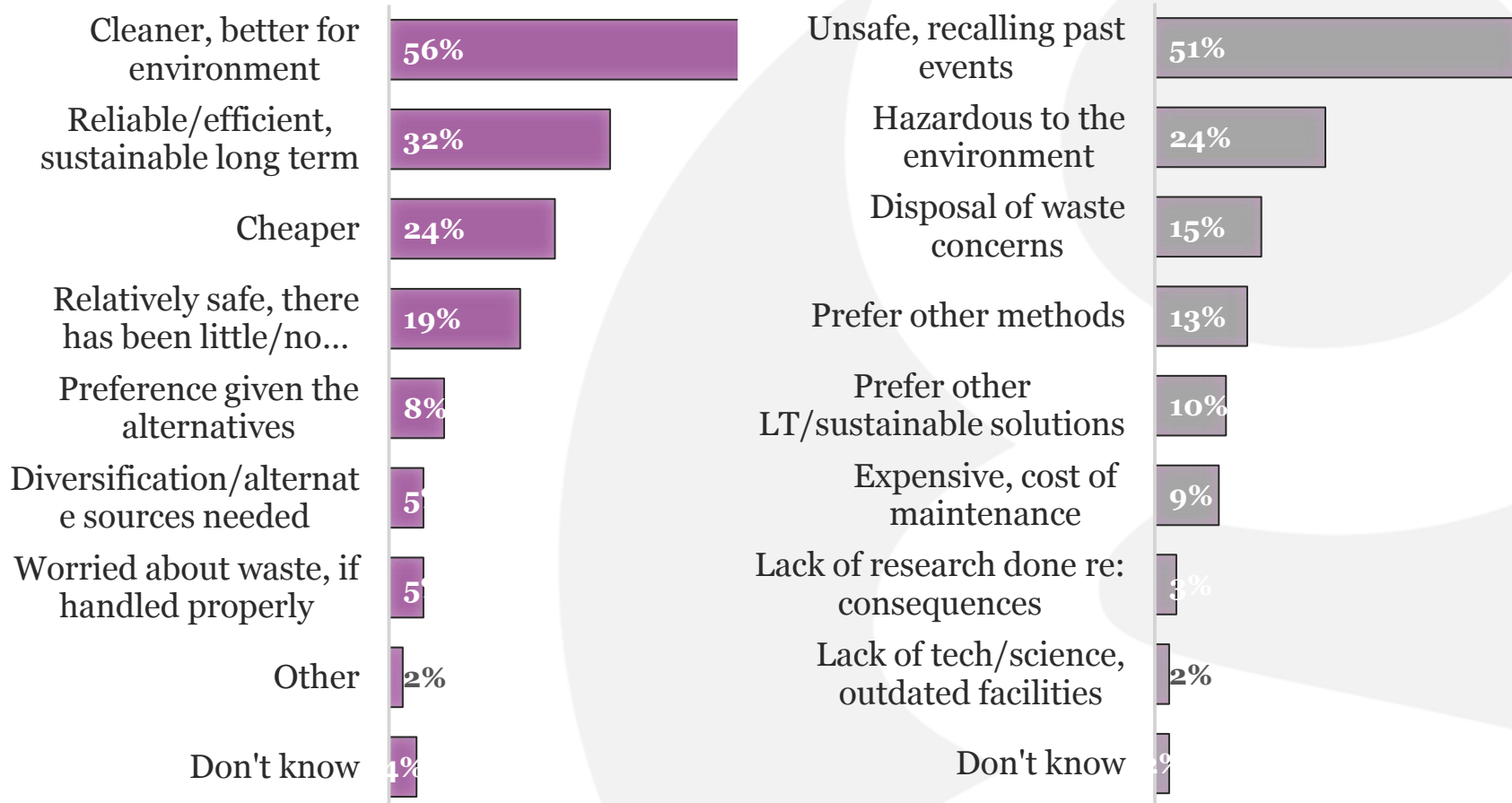


- Strongly support
- Somewhat support
- Somewhat oppose
- Strongly oppose
- Don't know



Reasons to Support/Oppose Nuclear

Why do you support/oppose using nuclear energy to produce electricity? [multiple mentions allowed],
[those that support nuclear energy, n=568; those that oppose nuclear energy, n=217]





Storage of Nuclear Waste

A majority (59%) of Ontarians say they are not familiar with the management and storage of nuclear waste in Ontario.

Three populations are reliably more aware of ‘things nuclear’ – men, Involved Ontarians and those in southwestern Ontario.

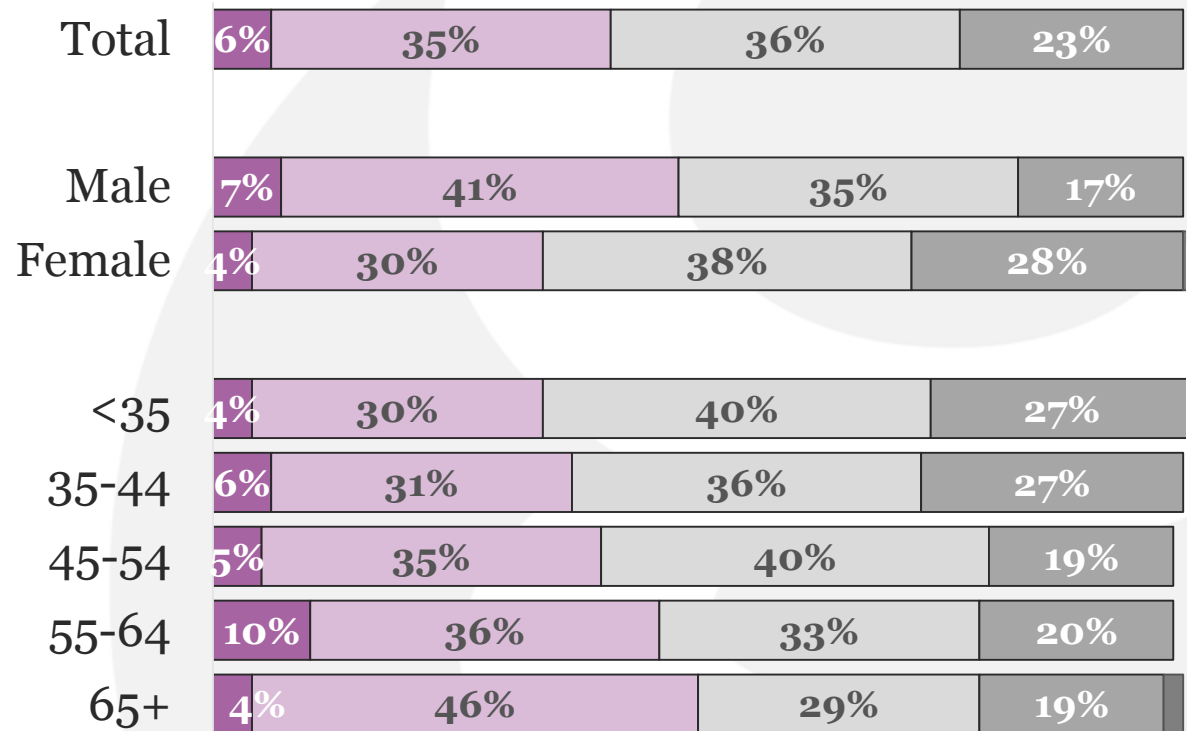
When asked what they think is currently done with nuclear waste, a plurality of Ontarians (35%) believe that the waste is stored underground, 27% couldn’t offer a guess, 13% believe it is stored in a waste facility, and 9% believe it is stored in cylinders, casings, or containers.

- Both those that feel familiar and those that feel unfamiliar with how waste is managed most commonly think that it is buried underground.
- However, those in southwestern Ontario are significantly less likely than other Ontarians to say the waste is buried underground (i.e. they actually *are* more familiar with storage methods).



Familiarity With Nuclear Waste Management

How familiar would you say you are with the management and storage of nuclear waste in Ontario? Would you say you are very familiar, somewhat familiar, not very familiar, or not at all familiar with how nuclear waste is stored in Ontario?

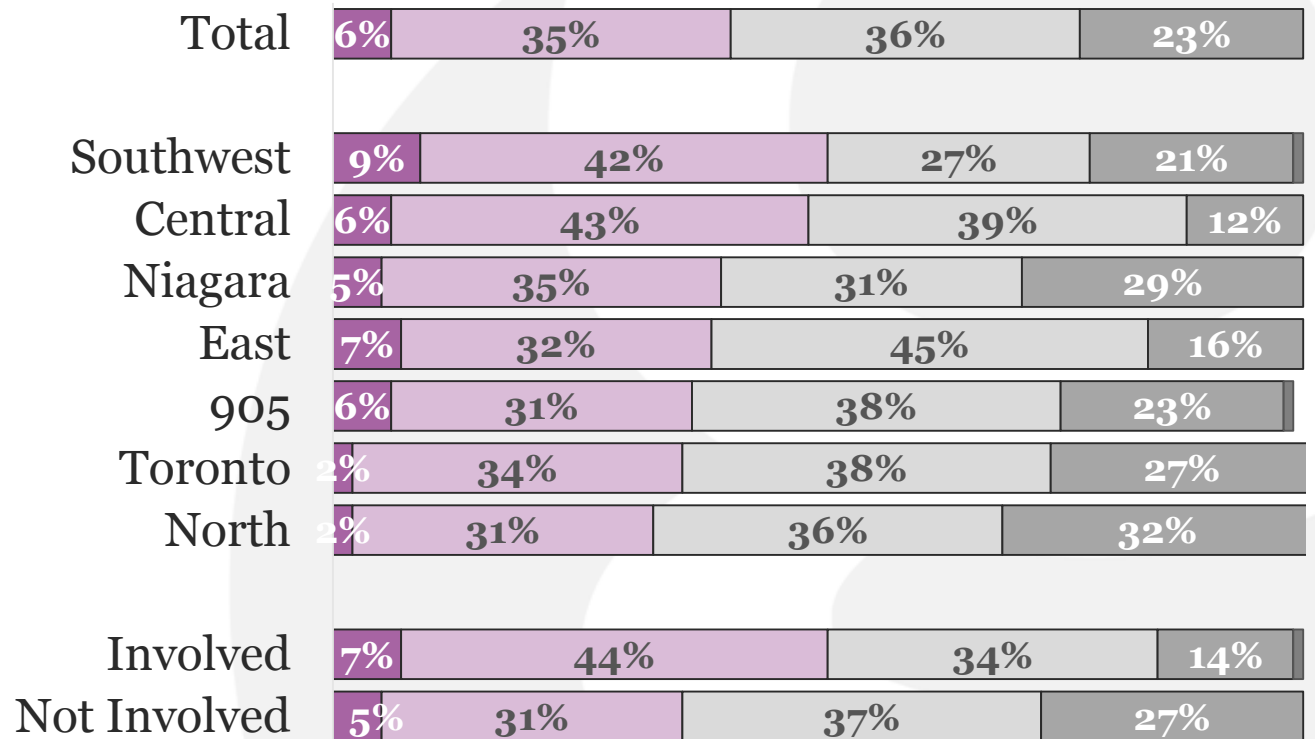


■ Very familiar ■ Somewhat familiar ■ Not very familiar ■ Not at all familiar ■ Don't know



Familiarity With Nuclear Waste Management

How familiar would you say you are with the management and storage of nuclear waste in Ontario? Would you say you are very familiar, somewhat familiar, not very familiar, or not at all familiar with how nuclear waste is stored in Ontario?

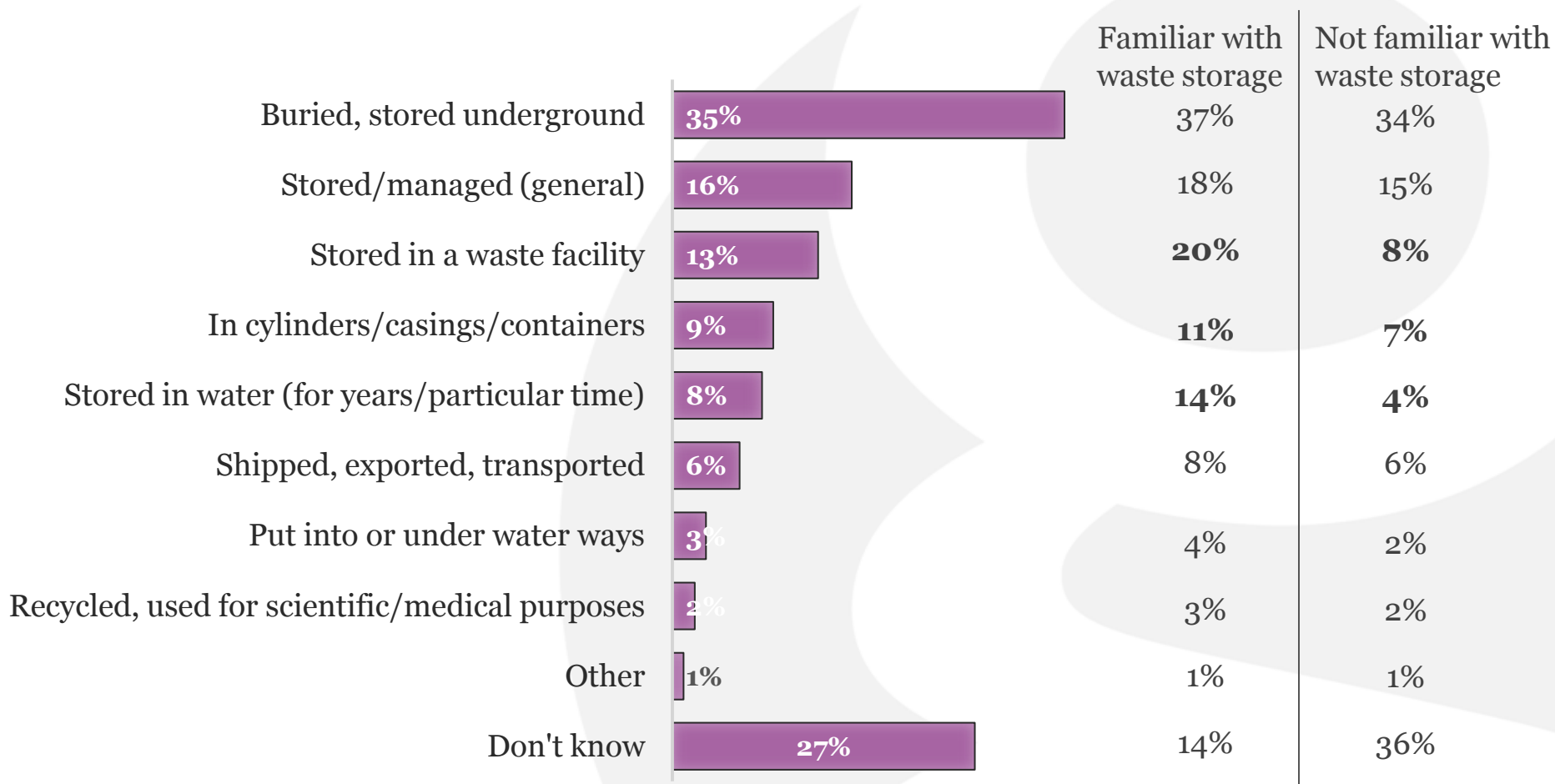


■ Very familiar ■ Somewhat familiar ■ Not very familiar ■ Not at all familiar ■ Don't know



What Is Done With The Waste?

And what do you think is currently done with the waste that is produced from the nuclear generation of electricity?





Familiarity with DGR

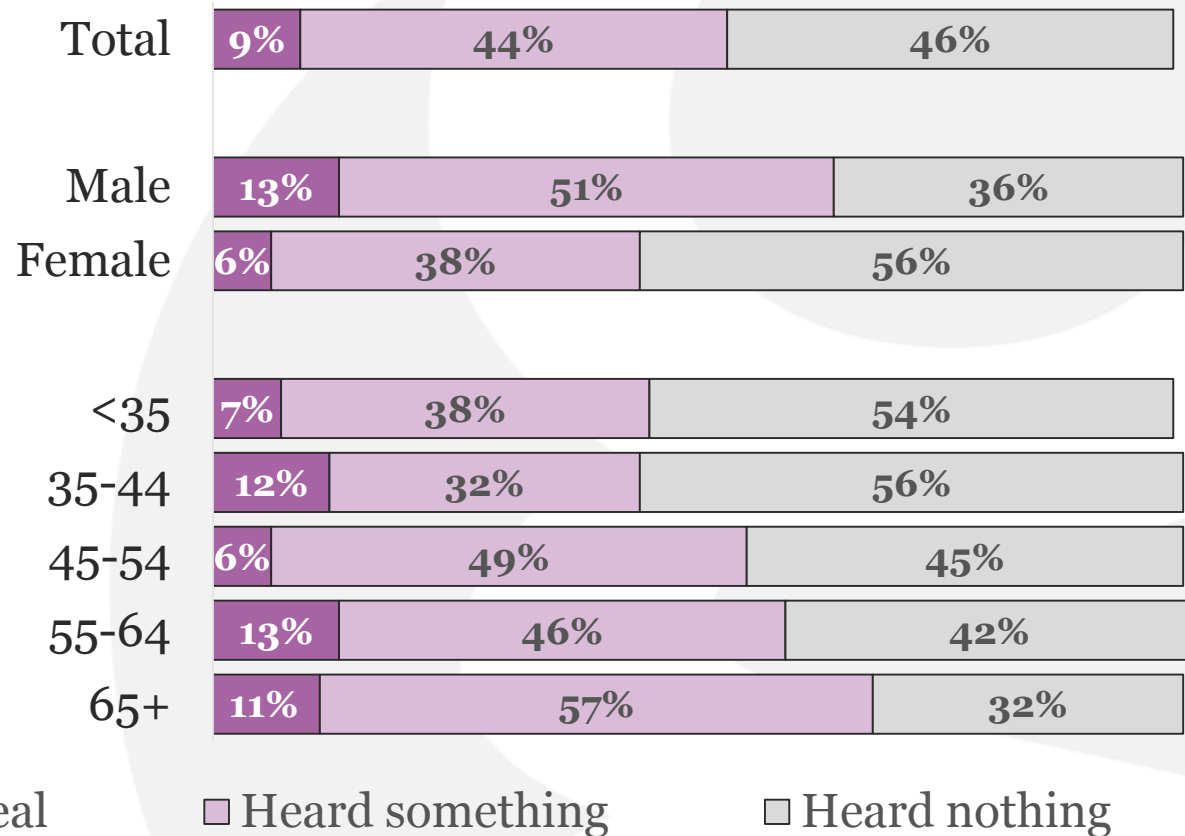
More than half (53%) of Ontarians say they have heard at least something about OPG's proposal to bury low and intermediate level waste for long term storage in a Deep Geologic Repository. Almost as many (46%) have heard nothing about it.

- Men are more likely to have heard something about it than women.
- Ontarians under 45 are least likely to have heard something about the DGR.
- More than 60% of those in the Southwest and Central Ontario say they have heard at least something about the DGR.
- And Involved Ontarians are much more likely to have heard something about the proposed DGR than Uninvolved Ontarians.



Familiarity With DGR

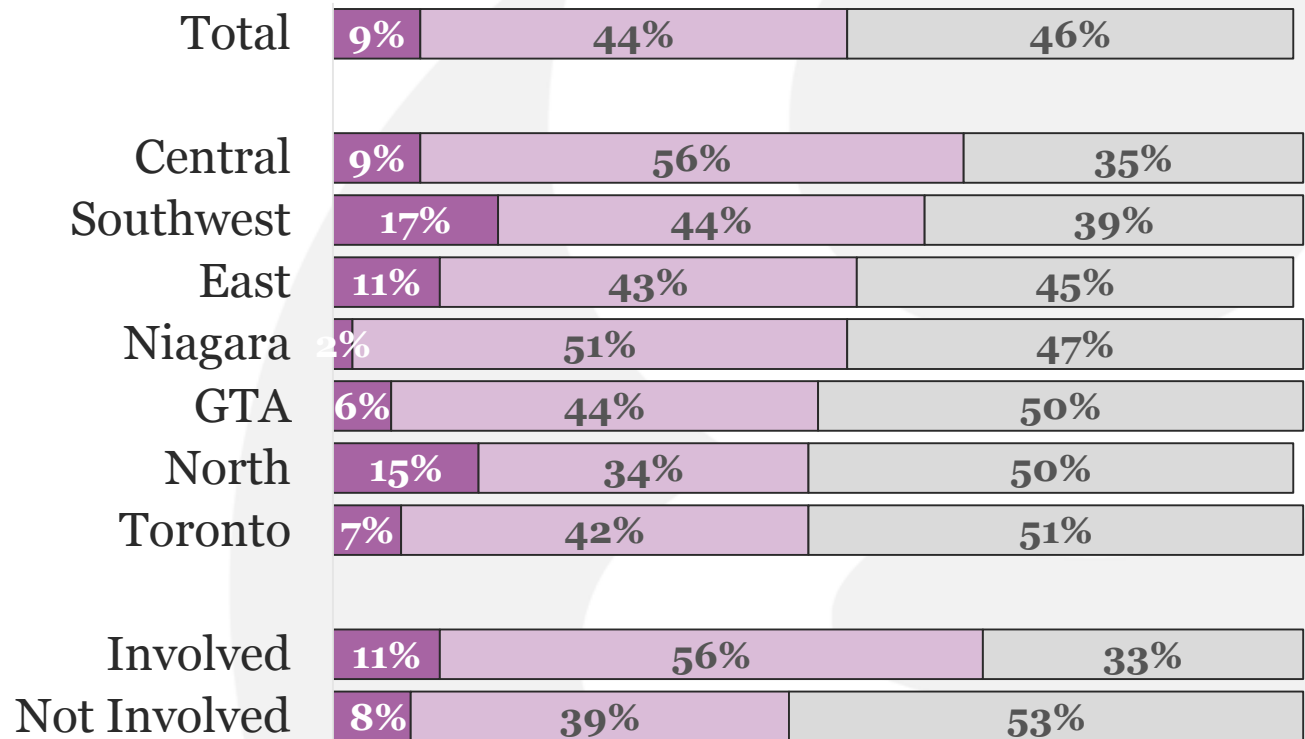
Ontario Power Generation has proposed to bury low and intermediate-level waste for long term storage in a Deep Geologic Repository, or DGR. Prior to now, would you say that you have heard a great deal, you have heard something, or you have heard...





Familiarity With DGR

Ontario Power Generation has proposed to bury low and intermediate-level waste for long term storage in a Deep Geologic Repository, or DGR. Prior to now, would you say that you have heard a great deal, you have heard something, or you have heard...



■ Heard a great deal

■ Heard something

■ Heard nothing



What Ontarians Have Heard

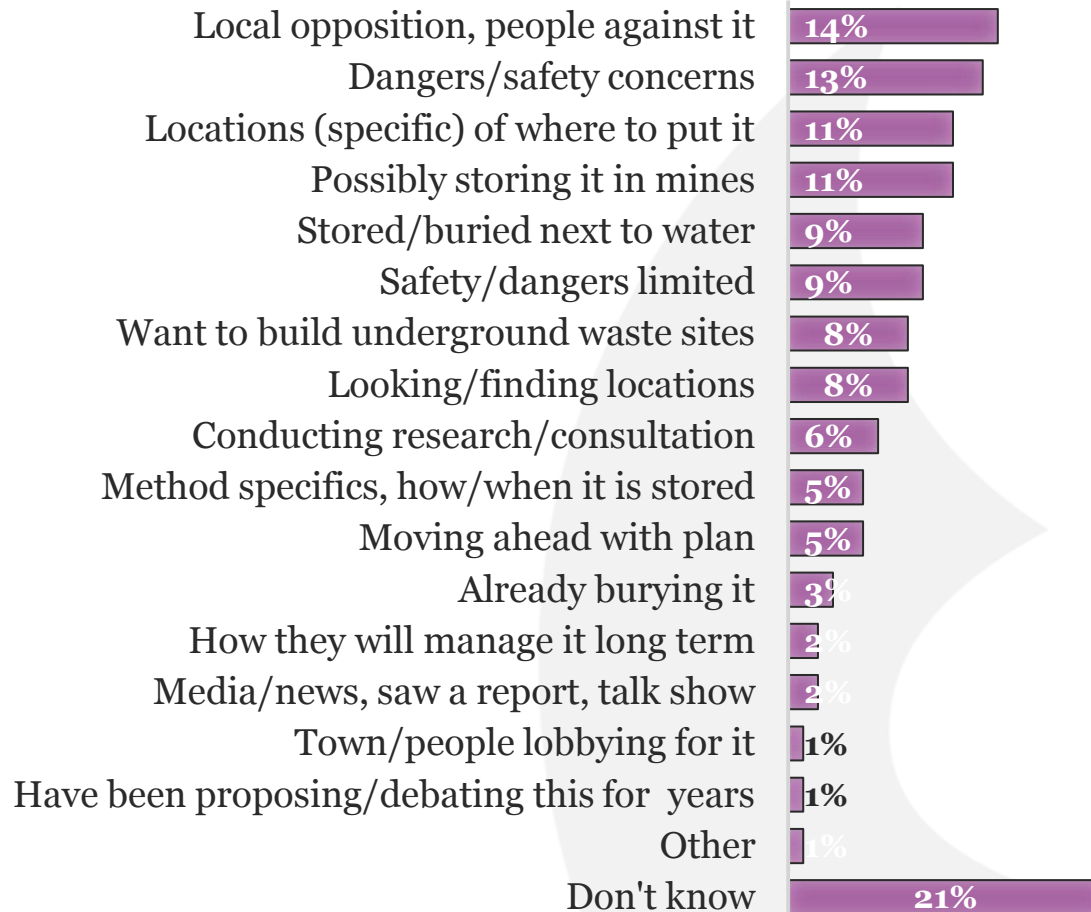
What Ontarians report hearing isn't good. One in five are unable to specify what they have heard. Of those that are able to provide a response, most common answers are:

- 14% - local opposition
- 13% - dangers/safety concerns
- 11% - possibly storing it in mines
- 11% - locations (specific mentions of where they are putting it)
- 8% - they are trying to find locations



What Ontarians Have Heard

And what have you heard about it? [Those who have heard a great deal or something, n=446]





Pre-Test: Support for DGR

Among those who have heard something about the DGR, most support it (59%) while 35% oppose it.

20% strongly support and 39% somewhat support.

Just 18% of those who have heard something about the DGR strongly oppose it but strong opposition is equal to strong support

Women, who have heard something about the DGR, are as likely to oppose it (49%) as support it (45%). And, opposition is *much* stronger than support. Twenty six percent of women who have heard something about the DGR strongly oppose it compared to just 6% who strongly support it.

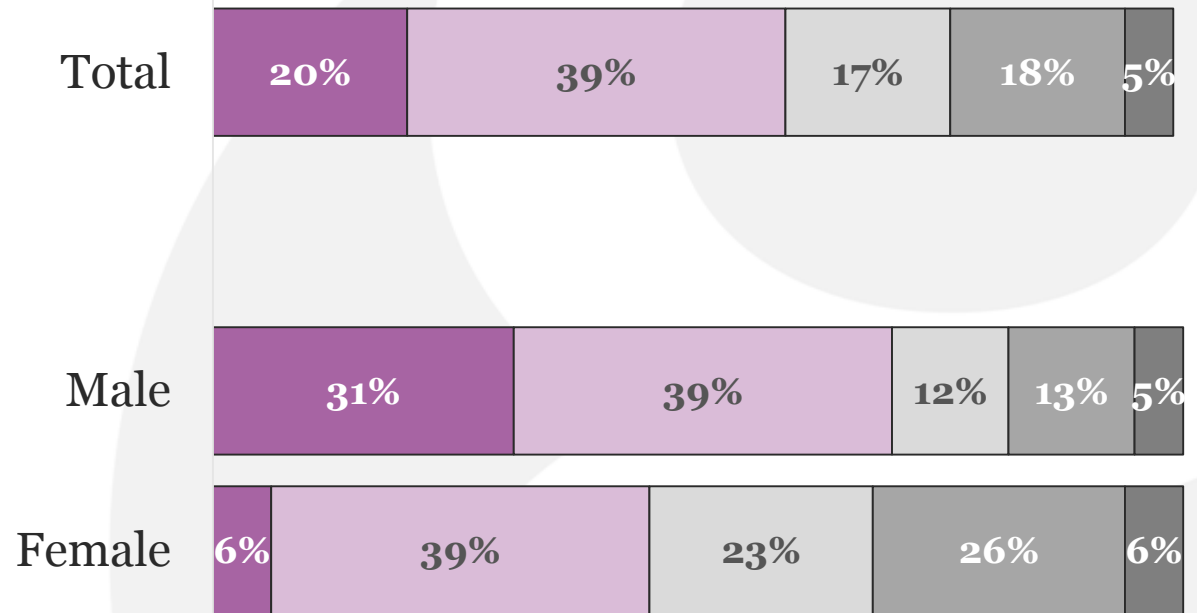
There is no difference in support between the Involved and Uninvolved.

And support does not vary by age.



And based on what you know, would you say that you strongly support, somewhat support, somewhat oppose, or strongly oppose a Deep Geological Repository being built in Ontario to store the waste produced by Ontario's nuclear generation of electricity?

[Those who have heard a great deal or something, n=446]



■ Strongly support
■ Strongly oppose

■ Somewhat support
■ Don't know

■ Somewhat oppose



Each element of the current description OPG uses for the DGR was tested in order to understand which elements are most important to Ontarians. Three elements of the description are best able to build confidence in the initiative:

1. International experts have concluded that these rock formations are stable and have excellent isolating capabilities.
2. OPG has safely transported, processed and stored low and intermediate-level nuclear waste for more than 40 years.
3. OPG has an obligation to future generations to dispose of this waste safely and responsibly where it cannot pose a threat to the public or the environment.

Regardless of gender, or support or opposition to the DGR, these three elements are most important.



Additionally, testing each of these elements in other ways in this research, confirms the importance of:

1. International nuclear science experts choose the location based on scientific findings of safety re: geology;
2. The managers of the DGR have a decades long history of safety and excellence; and
3. We have a responsibility to store the waste as safely as we can.

An additional element should be considered for the description. It is especially important to soft opponents - there is less risk with the DGR than with the current method. Risk mitigation, next step forward in responsible management.



Description of the DGR

For each, please tell me if it makes you much more confident, somewhat more confident, somewhat less confident, or much less confident with a Deep Geologic Repository being built in Ontario to store low and intermediate-level nuclear waste. **[Showing those that became more confident]**

Total	Men	Women	Support DGR	Oppose DGR	Description
74%	82%	67%	88%	40%	OPG has safely transported, processed and stored low and intermediate-level nuclear waste for more than 40 years.
49%	59%	39%	59%	26%	Currently, OPG stores this nuclear waste above ground, 100m from the proposed facility.
70%	79%	62%	86%	32%	The DGR would allow OPG to store low and intermediate level nuclear waste in the safest way possible for the long term.
74%	77%	71%	87%	41%	OPG has an obligation to future generations to dispose of this waste safely and responsibly where it cannot pose a threat to the public or the environment.
70%	76%	65%	88%	25%	The DGR would be built in Kincardine, Ontario, where it has the support of the town and surrounding municipalities.
70%	78%	65%	85%	37%	The DGR will store low-level nuclear waste, including items like mop heads, gloves, clothes and floor sweepings.
60%	70%	51%	78%	18%	The DGR will store intermediate-level nuclear waste, including used filters and resins, and reactor components.
68%	75%	62%	86%	32%	The DGR will safely isolate and contain the waste underground ensuring protection of the water and the environment.
67%	72%	62%	85%	23%	The DGR will be buried 680m underground, which is deeper than the CN Tower is tall.
63%	69%	57%	79%	21%	The DGR would be built beneath the existing secure Bruce nuclear power plant site.
70%	76%	64%	86%	27%	These rock formations, which are more than 450 million years old, are intact and do not have any major faults or fractures even though they have been subjected to many geologic events.
77%	82%	71%	93%	35%	International experts have concluded that these rock formations are stable and have excellent isolating capabilities.
69%	72%	66%	85%	29%	The construction of the DGR is already fully funded and would not affect electricity rates.



Communicating about the DGR builds support.

After hearing these initial descriptors, 70% of Ontarians were supportive of the DGR, (+11 over what they have heard in the ether) and 28% were opposed.

One third of those who opposed to the DGR pre-description (based on what they'd heard in the ether) supported the DGR after hearing these descriptors.

There remains a significant gender divide with men being more likely to support, and much more strongly supportive of the DGR than women.

- However, a majority of women (63%) are supportive of the DGR, and strong opposition and strong support are at comparable levels rather than the 4:1 ratio of strong opposition to strong support pre-description.

Support for the DGR is strongly associated with support for, or opposition to, the use of nuclear energy to produce electricity.

- Half of those who only somewhat oppose nuclear energy support the DGR. On balance, they are neutral (equally balanced in support/oppose).
- And, 80% of those who only somewhat support nuclear energy support the DGR.



Support After Description

While younger Ontarians (under 45) started with less familiarity with the storage of nuclear waste and the proposed DGR specifically, after hearing this information, they are more supportive of the DGR than older Ontarians.

Support is quite broad regionally, although both Central Ontario and Southwest Ontario have a sizeable portion (~22% each) that are strongly opposed. However, strong support outweighs strong opposition in every region.

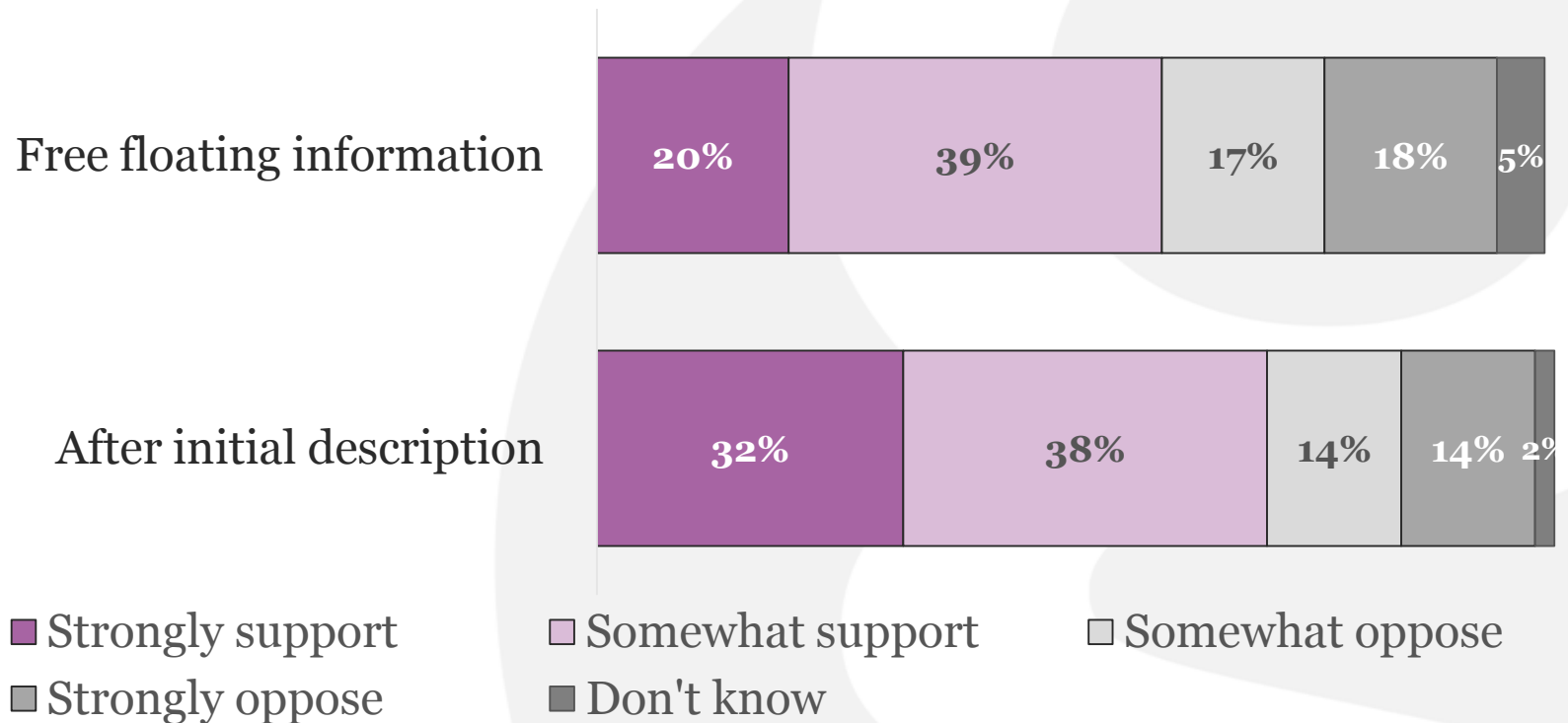
Residents in the GTA (77%) are more supportive than residents in other regions of the province.

Involved Ontarians are significantly more likely to be opposed than non involved; however, 2/3 of Involved are supportive of the DGR.



Support After Description

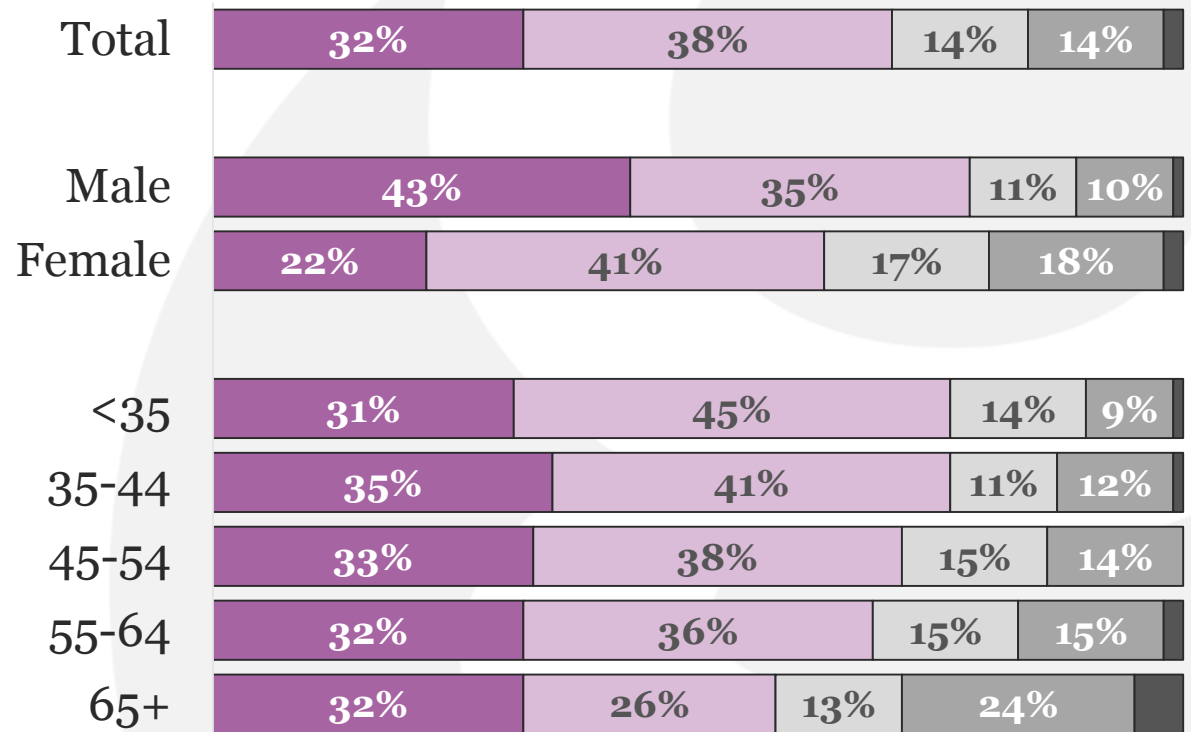
After hearing this information, would you say that you strongly support, somewhat support, somewhat oppose, or strongly oppose Ontario Power Generation building a Deep Geological Repository for low and intermediate level nuclear waste in Kincardine, Ontario?





Support After Description

After hearing this information, would you say that you strongly support, somewhat support, somewhat oppose, or strongly oppose Ontario Power Generation building a Deep Geological Repository for low and intermediate level nuclear waste in Kincardine, Ontario?

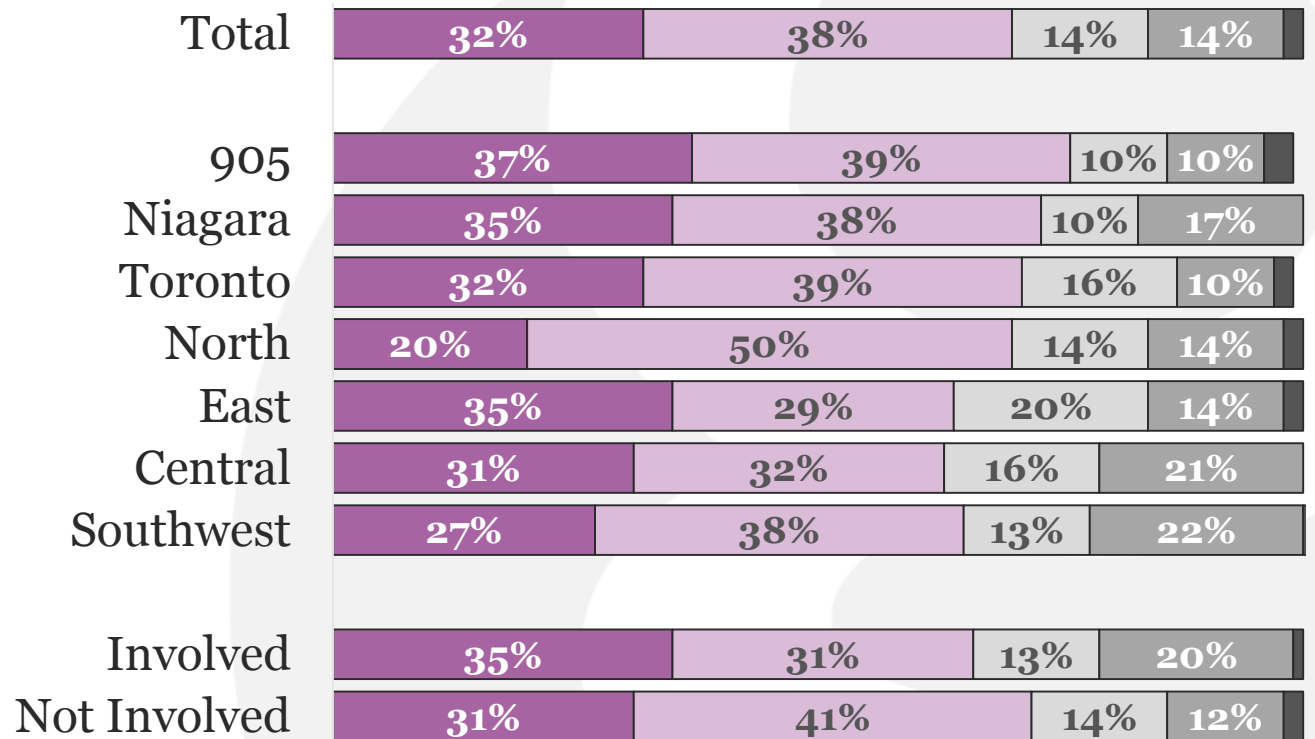


■ Strongly support ■ Somewhat support □ Somewhat oppose ■ Strongly oppose ■ Don't know



Support After Description

After hearing this information, would you say that you strongly support, somewhat support, somewhat oppose, or strongly oppose Ontario Power Generation building a Deep Geological Repository for low and intermediate level nuclear waste in Kincardine, Ontario?

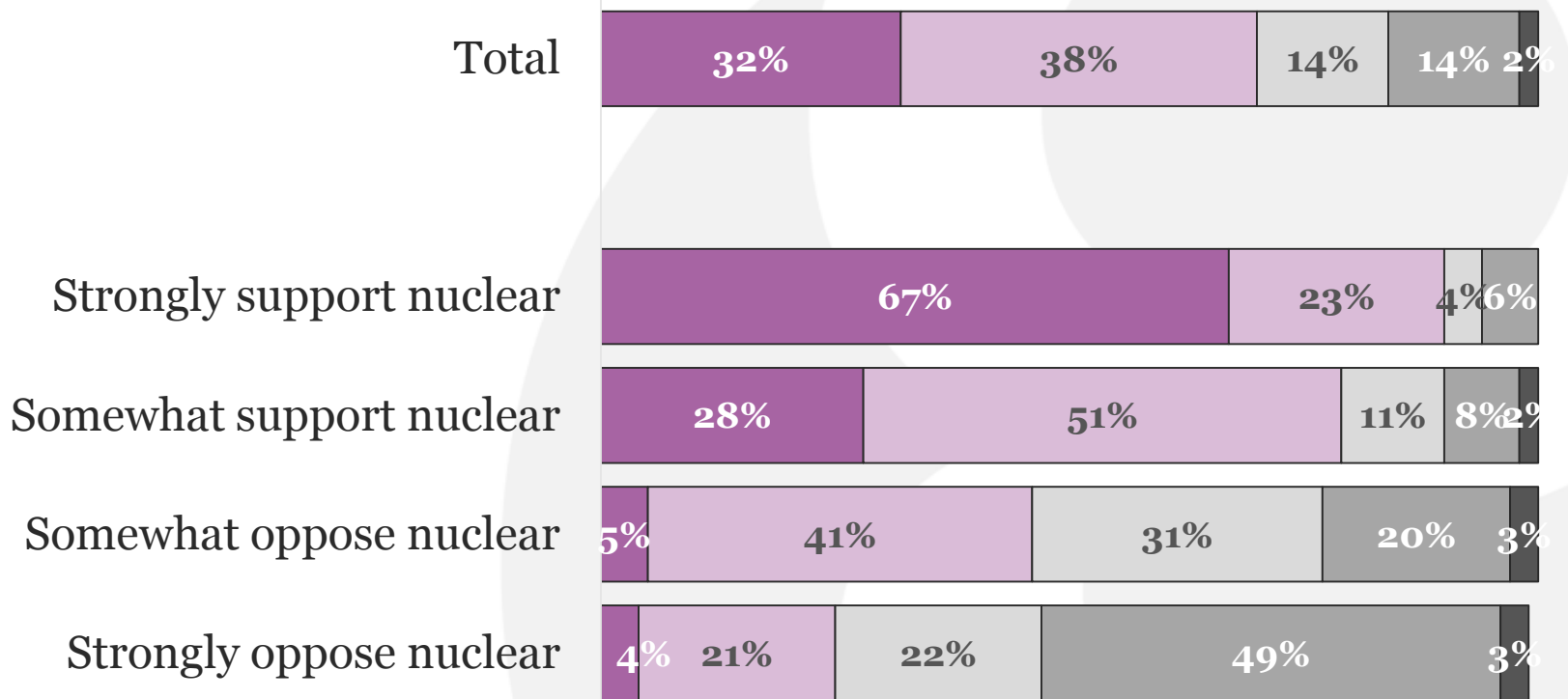


■ Strongly support ■ Somewhat support □ Somewhat oppose ■ Strongly oppose ■ Don't know



Support After Description

After hearing this information, would you say that you strongly support, somewhat support, somewhat oppose, or strongly oppose Ontario Power Generation building a Deep Geological Repository for low and intermediate level nuclear waste in Kincardine, Ontario?



■ Strongly support ■ Somewhat support ■ Somewhat oppose ■ Strongly oppose ■ Don't know



Respondents were presented with a series of critiques of the proposed DGR to test the resonance of each critique.

Seventy percent of Ontarians support the DGR after a description. As a consequence, we recommend focusing on shoring up this support. Opponents (30%) even soft opponents are unlikely to move for a variety of reasons that will become clear. However, we also explore the soft opponents to keep them 'soft' rather than strong and vocal.

There are no regional differences in the resonance of the critiques – residents in the Southwest and Central regions are not more receptive than other Ontarians.

All critiques are more resonant among women than among men and among opponents to nuclear energy.

The strongest critique resonates with just half of DGR post description supporters.



The most damaging criticism that will speak to current perceptions is *the DGR would be built too close to Lake Huron, threatening the health of the lake and our drinking water.*

- Two thirds of Ontarians agree with this critique. This rises to 70% of women.

Just over half (54%) of those who support the DGR post description agree with this critique.

Second most effective is that *DGRs have failed in other locations, so the science can't be trusted.* More than half of Ontarians (56%) agree with this critique including two thirds of women and 86% of opponents to the DGR post description.

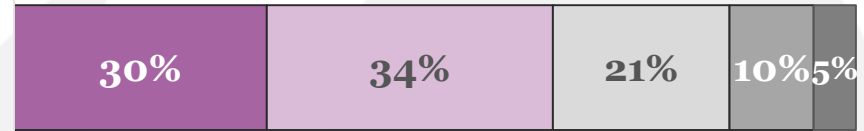
The critique that Kincardine is the only location that OPG explored is as effective with 52% of Ontarians in agreement.

Of least impact is that the nuclear waste should continue to be stored above ground until a better solution can be found, with a majority disagreeing with this critique.



Do you strongly agree, somewhat agree, somewhat disagree or strongly disagree with this argument?

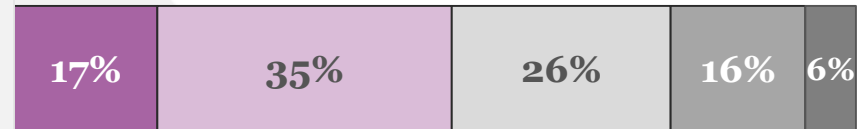
The DGR will be built 1.2 kilometers away from Lake Huron, it will pose a threat to our drinking water and to the health of the Lake.



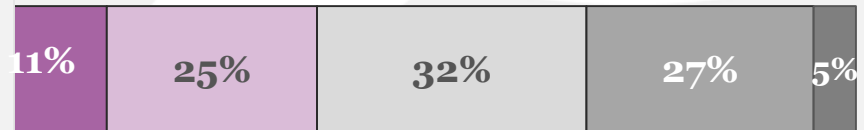
Other Deep Geologic Repositories have failed in other countries, so the science can't be trusted.



We can't be confident that Kincardine is a good location for the Deep Geologic Repository because OPG didn't look at other locations.



Nuclear waste should continue to be stored above ground until a better solution is found.

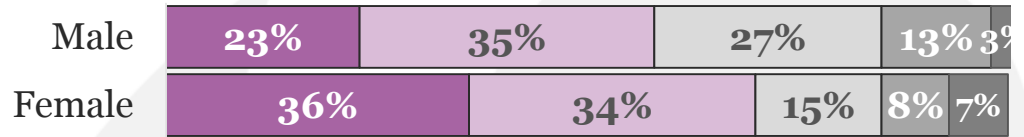


■ Strongly agree ■ Somewhat agree ■ Somewhat disagree ■ Strongly disagree ■ Don't know

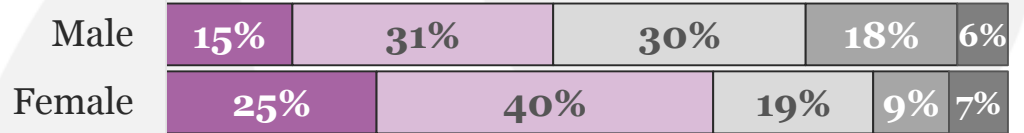


Do you strongly agree, somewhat agree, somewhat disagree or strongly disagree with this argument?
[Male n=420; Female n=385]

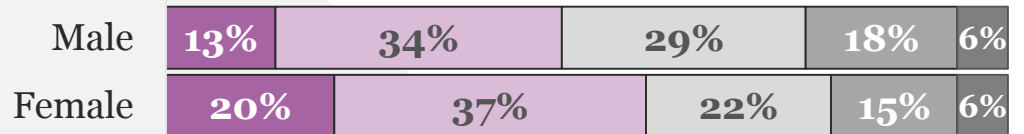
The DGR will be built 1.2 kilometers away from Lake Huron, it will pose a threat to our drinking water and to the health of the Lake.



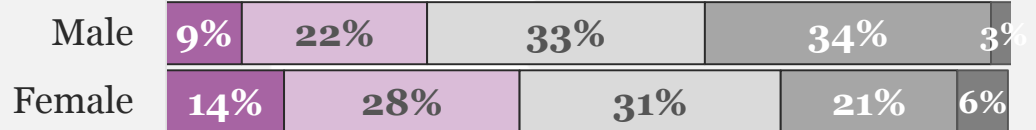
Other Deep Geologic Repositories have failed in other countries, so the science can't be trusted.



We can't be confident that Kincardine is a good location for the Deep Geologic Repository because OPG didn't look at other locations.



Nuclear waste should continue to be stored above ground until a better solution is found.



■ Strongly agree ■ Somewhat agree ■ Somewhat disagree ■ Strongly disagree ■ Don't know



Critique among DGR supporters

These critiques have resonance even among the 70% of Ontarians who support the DGR after hearing it described. The three strongest critiques resonate among half of supporters – particularly soft supporters.

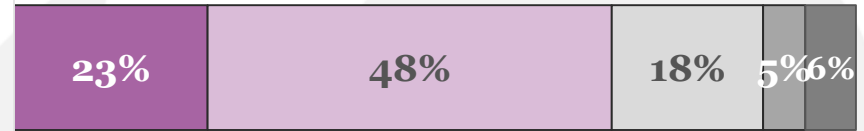
- More than half agree that the DGR may pose a risk to drinking water and the health of the lake due to its proximity – this rises to 70% of soft supporters;
- Almost half agree that failure of DGRs in other countries means the science cannot be trusted – 60% of soft supporters; and
- Almost half that Kincardine may not be the right location if it is the only place OPG explored – almost 60% of soft supporters.

Supporters outright reject that the waste should continue to be stored above ground until a better solution is found including 60% of soft supporters.



Do you strongly agree, somewhat agree, somewhat disagree or strongly disagree with this argument?
[those that somewhat support DGR after description, n=304]

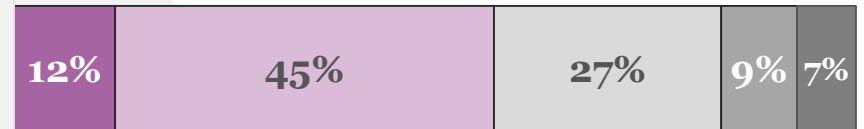
The DGR will be built 1.2 kilometers away from Lake Huron, it will pose a threat to our drinking water and to the health of the Lake.



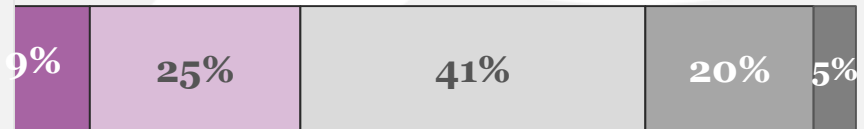
Other Deep Geologic Repositories have failed in other countries, so the science can't be trusted.



We can't be confident that Kincardine is a good location for the Deep Geologic Repository because OPG didn't look at other locations.



Nuclear waste should continue to be stored above ground until a better solution is found.



■ Strongly agree ■ Somewhat agree ■ Somewhat disagree ■ Strongly disagree ■ Don't know



Critiques Among Soft Opponents

- ❑ The critiques are much more resonant among soft opponents to the DGR – the divide between soft support and soft opposition is relatively steep both in terms of resonance of critiques and strength of the types of rebuttals that work.
- ❑ Virtually all soft opponents agree that water quality and the Lake are at risk by the proposed site of the DGR and virtually all soft opponents agree that if other DGRs have failed, the science cannot be trusted
- ❑ 60% would prefer to store the waste above ground until a better solution is found.



Do you strongly agree, somewhat agree, somewhat disagree or strongly disagree with this argument?
[those that somewhat oppose DGR after description, n=112]

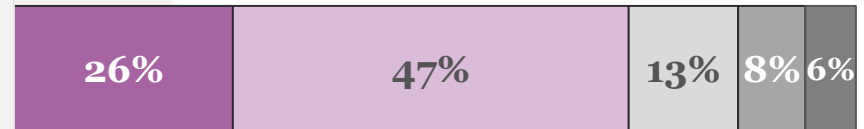
The DGR will be built 1.2 kilometers away from Lake Huron, it will pose a threat to our drinking water and to the health of the Lake.



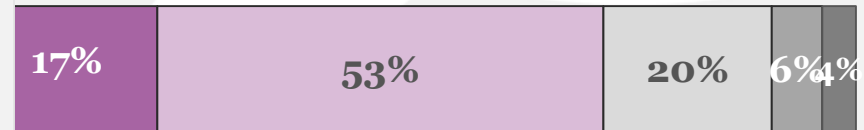
Other Deep Geologic Repositories have failed in other countries, so the science can't be trusted.



We can't be confident that Kincardine is a good location for the Deep Geologic Repository because OPG didn't look at other locations.



Nuclear waste should continue to be stored above ground until a better solution is found.



■ Strongly agree ■ Somewhat agree ■ Somewhat disagree ■ Strongly disagree ■ Don't know



Rebuttals to Water Critique

Almost two thirds of Ontarians agree that *because the Deep Geologic Repository will be built 1.2 kilometers away from Lake Huron, it will pose a threat to our drinking water and to the health of the Lake.*

- After this critique, respondents were presented with a series of rebuttals.

The best rebuttals are science based with international scientific experts as a source:

- The location has been endorsed by Canadian and international experts (68% saying this is a strong argument)
- International experts find the rock to be virtually impenetrable (67% saying this is a strong argument)
- Geologists say that the impermeability of the rock means that Lake Huron is as safe with the Deep Geologic Repository 1.2 kilometers away as it would be with the Deep Geologic Repository 100 km away (60% saying this is a strong argument)

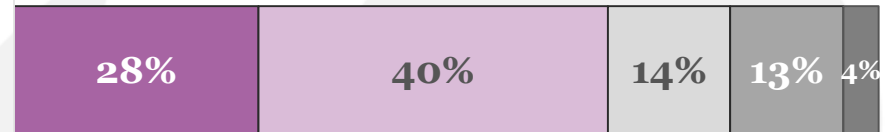
Telling respondents that *the 10,000 people who work at OPG all live on the Great Lakes and its tributaries and they would not propose to do something that would harm the water system* – is much less effective with 51% saying that this is a strong argument.



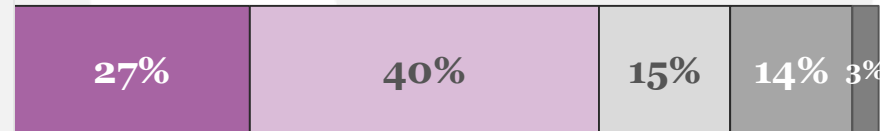
Rebuttals to Water Critique

Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

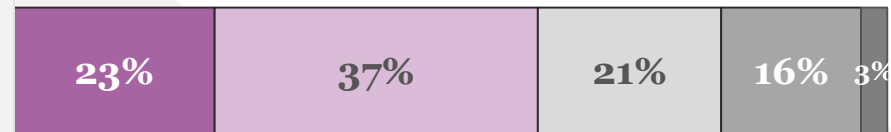
The location of the proposed Deep Geologic Repository has been endorsed by Canadian and international experts.



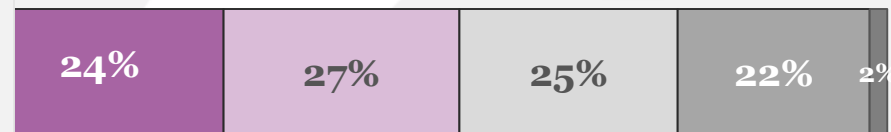
International experts say that the limestone rock that the Deep Geologic Repository would be buried in is virtually impenetrable, which prevents any leaking.



Geologists say that the impermeability of the rock means that Lake Huron is as safe with the Deep Geologic Repository 1.2 kilometers away as it would be with the Deep Geologic Repository 100 km away.



The 10,000 people who work at OPG all live on the Great Lakes and its tributaries and they would not propose to do something that would harm the water system.



■ Very strong ■ Somewhat strong ■ Somewhat weak ■ Very weak ■ Don't know



Shoring up the Support

Among those who are only somewhat supportive of the DGR pre critiques, the two rebuttals are persuasive arguments among three quarters of this ‘movable middle’ population.

- The location has been endorsed by Canadian and international experts
- International experts find the rock to be virtually impenetrable

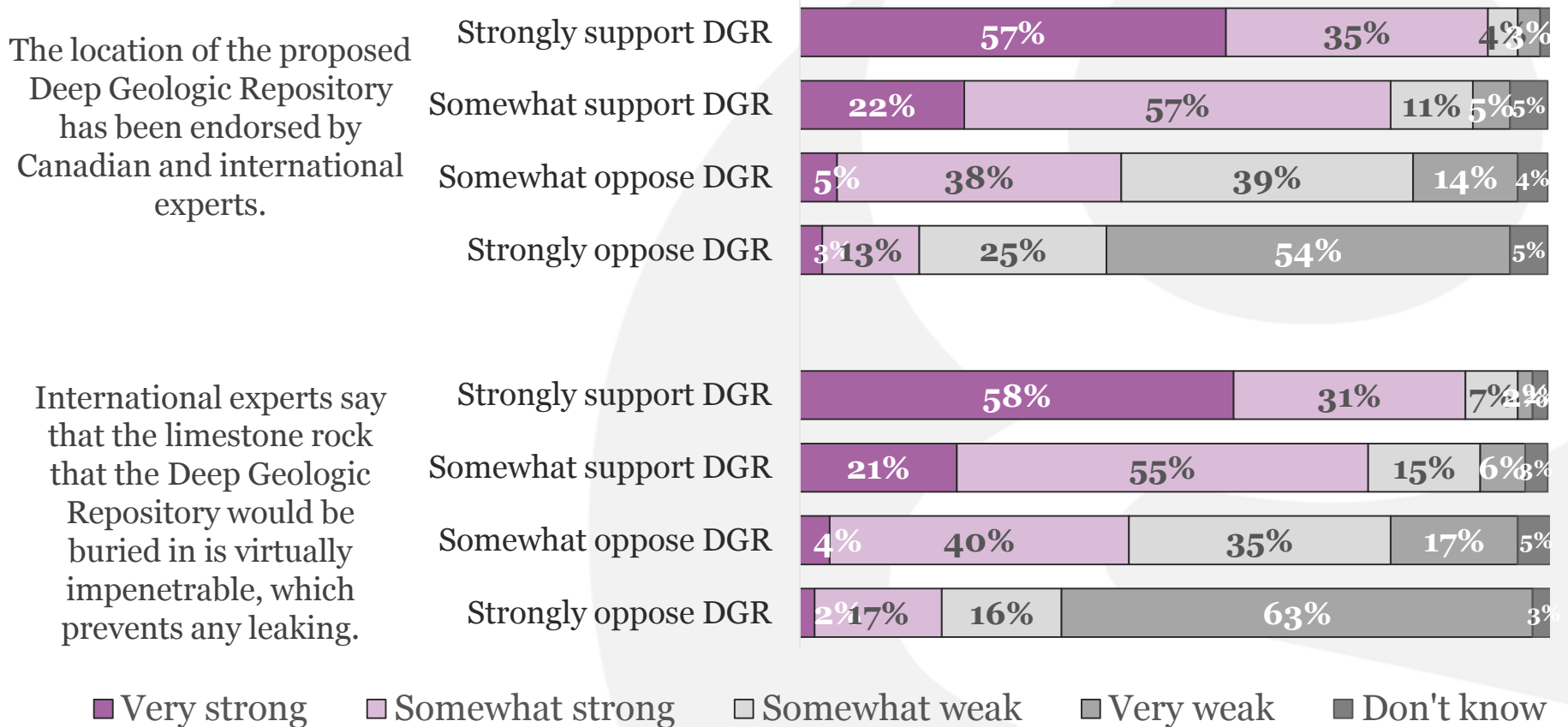
However, less than half of those somewhat opposed (the other movable middle) to the DGR pre critiques find these rebuttals even somewhat strong. As becomes evident science is not the way to move these people – normative (responsibility) and risk mitigation is.

When looking at the strength of the rebuttals to addressing the critique (rather than on position toward DGR), about 40% of those who strongly agree with the critique find the top two rebuttals very strong arguments. Those who somewhat agree with the critiques are much more persuaded (70%+).



Rebuttals to Water Critique

Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.



Criticism: Some people argue that because the Deep Geologic Repository will be built 1.2 kilometers away from Lake Huron, it will pose a threat to our drinking water and to the health of the Lake.

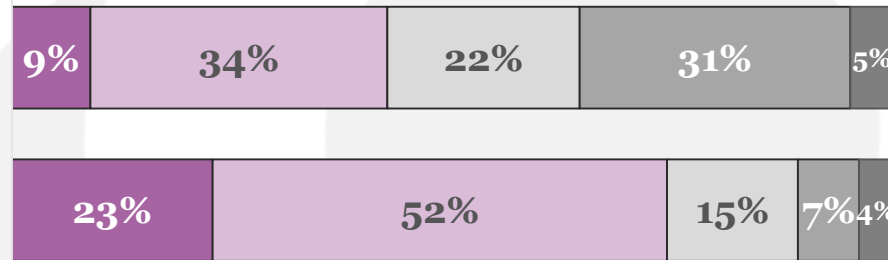


Rebuttals to Water Critique

Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

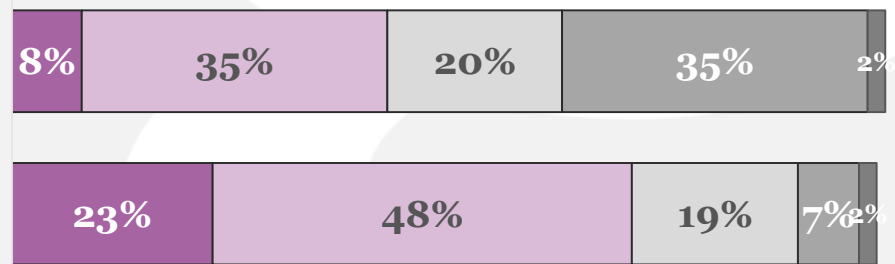
The location of the proposed Deep Geologic Repository has been endorsed by Canadian and international experts.

Strongly agree with critique
Somewhat agree with critique



International experts say that the limestone rock that the Deep Geologic Repository would be buried in is virtually impenetrable, which prevents any leaking.

Strongly agree with critique
Somewhat agree with critique



■ Very strong ■ Somewhat strong ■ Somewhat weak ■ Very weak ■ Don't know



Rebuttals to Science Critique

More than half (56%) of Ontarians agree with the critique that *other Deep Geologic Repositories have failed in other countries, so the science can't be trusted.*

Both rebuttals tested were effective:

- DGRs have safely stored waste around the world, including the US, Sweden, Germany, Korea, and Finland, and
- International experts and the USA EPA agree that the DGR will protect the environment.

80%+ of Ontarians who somewhat support the DGR find these effective arguments.

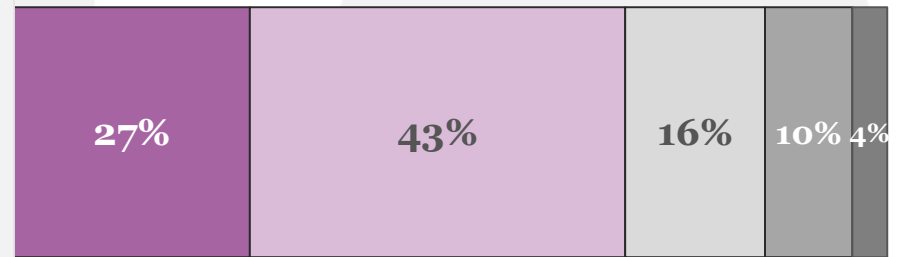
And, once again, less than half of those who somewhat oppose the DGR find these effective arguments against the critique.



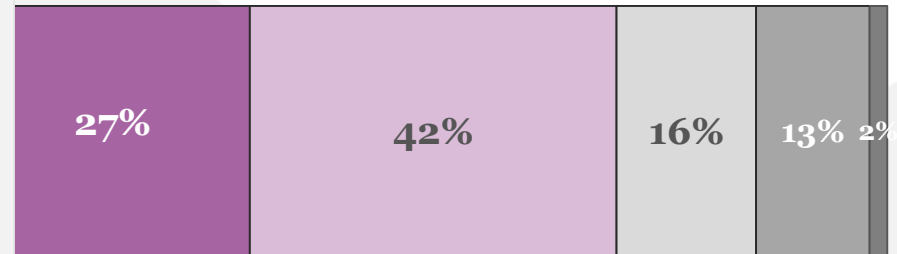
Rebuttals to Science Critique

Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

Deep Geologic Repositories have safely stored waste around the world, including in the United States, Sweden, Germany, Korea and Finland.



Experts from around the world, including the US Environmental Protection Agency, agree that this Deep Geological Repository will protect the environment from the nuclear waste.



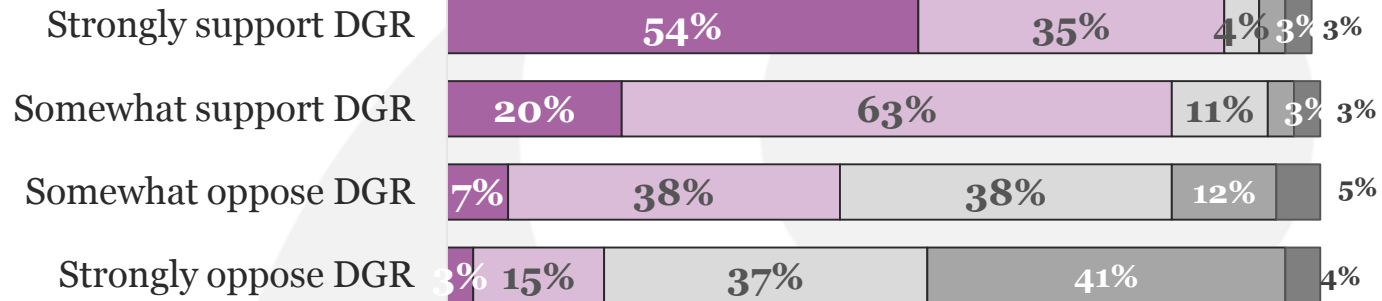
■ Very strong ■ Somewhat strong ■ Somewhat weak ■ Very weak ■ Don't know



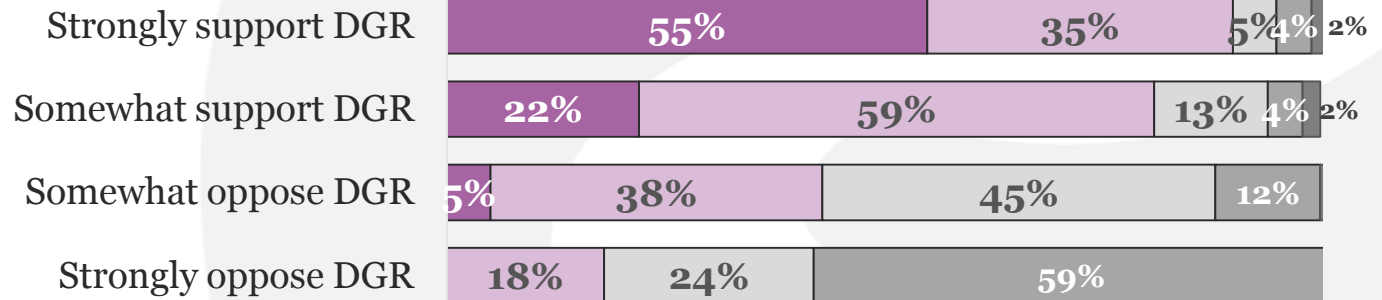
Rebuttals to Science Critique

Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

Deep Geologic Repositories have safely stored waste around the world, including in the United States, Sweden, Germany, Korea and Finland.



Experts from around the world, including the US Environmental Protection Agency, agree that this Deep Geological Repository will protect the environment from the nuclear waste.



Very strong Somewhat strong Somewhat weak Very weak Don't know

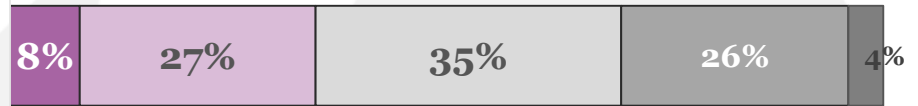


Rebuttals to Science Critique

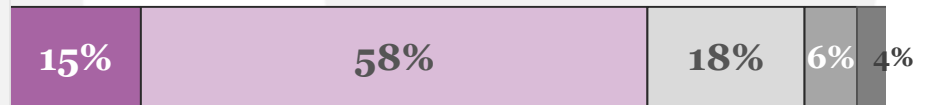
Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

Deep Geologic Repositories have safely stored waste around the world, including in the United States, Sweden, Germany, Korea and Finland.

Strongly agree with critique

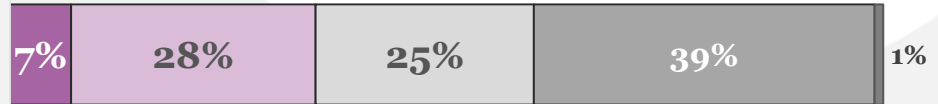


Somewhat agree with critique



Experts from around the world, including the US Environmental Protection Agency, agree that this Deep Geological Repository will protect the environment from the nuclear waste.

Strongly agree with critique



Somewhat agree with critique



■ Very strong ■ Somewhat strong □ Somewhat weak ■ Very weak ■ Don't know



Rebuttals to Location Critique

Just under half (45%) of Ontarians agree with the critique that *we can't be confident that Kincardine is a good location for the Deep Geologic Repository because OPG didn't look at other locations.*

Two rebuttals were effective among three quarters of Ontarians:

- There is an increased risk of transporting the waste to an alternative site, and
- A full environmental assessment conducted by a federally appointed panel of experts believes Kincardine is the right location.

Critically, two rebuttals to this criticism are not particularly useful.

- The argument that Kincardine is the only community to volunteer to host the facility implies a 'least resistance' rationale for the site location, and
- The argument that a nuclear facility is already located at this location suggests a 'convenience' rationale for the location.

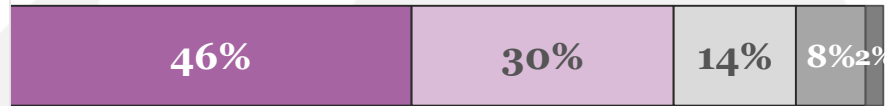
Ontarians are looking for scientific best practices as the rationale.



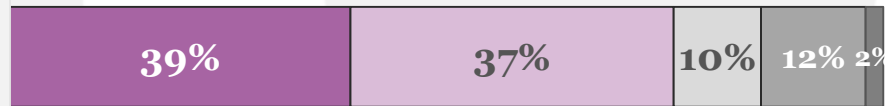
Rebuttals to Location Critique

Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

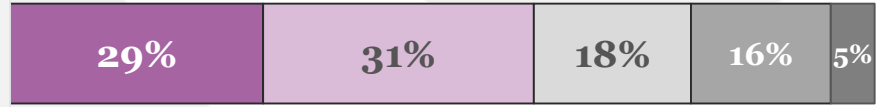
If the DGR was built elsewhere, the risks of transporting all the radioactive material by truck would greatly increase the risk of the project.



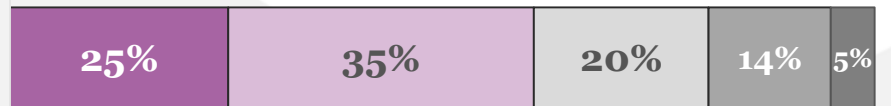
After a full environmental assessment, a federally appointed panel of experts says this is the right location. It has some of the best geology in the...



Kincardine is the only community in 15 years to state an interest in hosting the DGR.



Most of the waste proposed for the DGR for this site currently sits aboveground 100 metres from the proposed DGR site.



This DGR would be built on the site of the largest nuclear plant in the world.



Very strong
 Somewhat strong
 Somewhat weak
 Very weak
 Don't know



Shoring Up the Movable Middle

The top two rebuttals are very strong among those who only somewhat support the DGR; however, the rebuttal that relies on science and experts is more persuasive (90%) than the rebuttal that discusses minimizing the risk of transporting the waste.

Among those who somewhat oppose the DGR, more than half find these rebuttals effective.

Notably, the risk minimization rebuttal was stronger with opponents than the science best practice argument.

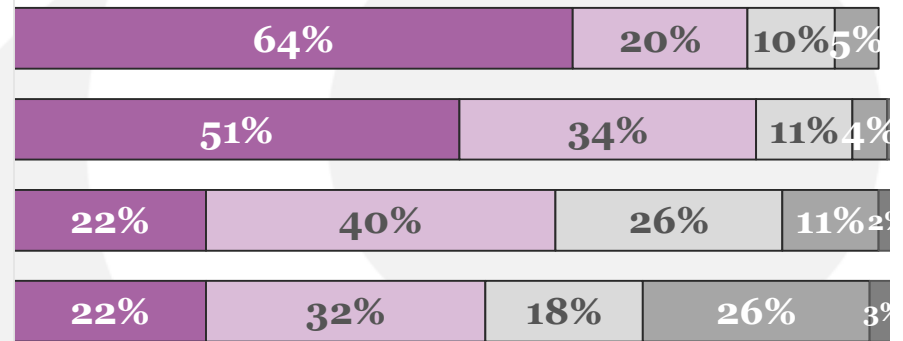


Rebuttals to Location Critique

Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

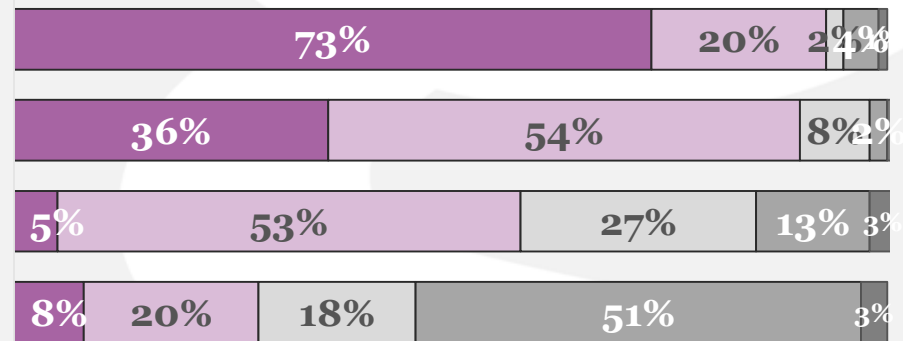
If the DGR was built elsewhere, the risks of transporting all the radioactive material by truck would greatly increase the risk of the project.

Strongly support DGR
Somewhat support DGR
Somewhat oppose DGR
Strongly oppose DGR



After a full environmental assessment, a federally appointed panel of experts says this is the right location. It has some of the best geology in the world for a deep repository.

Strongly support DGR
Somewhat support DGR
Somewhat oppose DGR
Strongly oppose DGR



Very strong Somewhat strong Somewhat weak Very weak Don't know

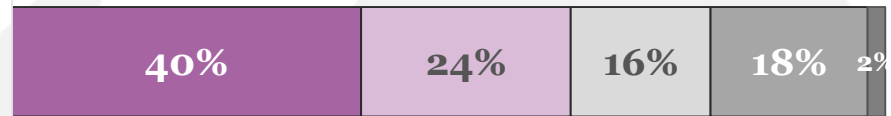


Rebuttals to Location Critique

Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

If the DGR was built elsewhere, the risks of transporting all the radioactive material by truck would greatly increase the risk of the project.

Strongly agree with critique

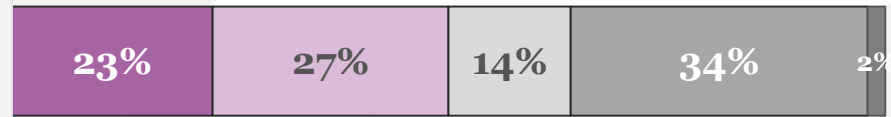


Somewhat agree with critique



After a full environmental assessment, a federally appointed panel of experts says this is the right location. It has some of the best geology in the world for a deep repository.

Strongly agree with critique



Somewhat agree with critique



■ Very strong ■ Somewhat strong □ Somewhat weak ■ Very weak ■ Don't know



Rebuttals to Better Option Critique

Just over one third of Ontarians (36%) agree with the critique that *nuclear waste should continue to be stored above ground until a better solution is found*. So the resonance of this critique is not strong to begin.

Two rebuttals are particularly strong:

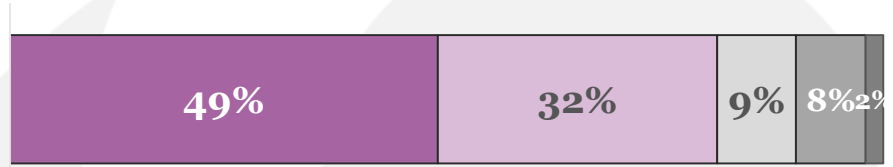
- International experts find that it is much safer to bury waste deep underground than to let it sit aboveground where it is vulnerable to weather and other hazards (81% strong argument); and
- OPG wants to take responsibility for the waste now, rather than passing it on to the future generations (78% strong argument).



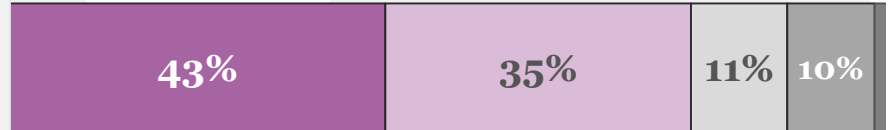
Rebuttals to Better Option Critique

Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

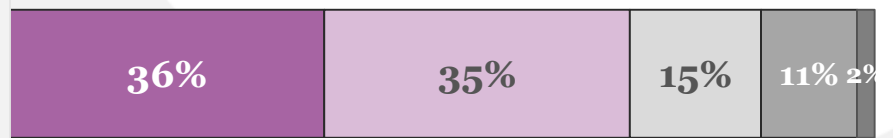
International experts find that it is much safer to bury waste deep underground than to let it sit aboveground where it is vulnerable to weather and other hazards.



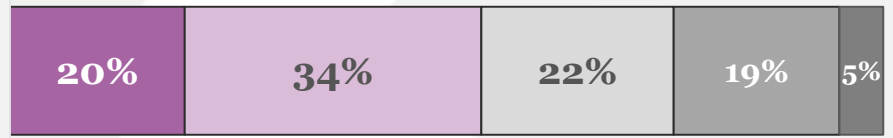
OPG wants to take responsibility for the waste now, rather than passing it on the future generations.



The project underwent the most rigorous environmental assessment in Canada and it was concluded the project should be built here now.



Countries around the world are using Deep Geologic Repositories safely, often closer to large bodies of water.



Very strong
 Somewhat strong
 Somewhat weak
 Very weak
 Don't know



Shoring Up the Moveable Middle

International experts find that it is much safer to bury waste deep underground than to let it sit aboveground where it is vulnerable to weather and other hazards is the strongest rebuttal at shoring up the movable middle.

- 90%+ of those who only somewhat support the DGR find this a strong argument; and
- Almost 2/3 of those who somewhat oppose the DGR find this a strong argument.

Also critical to directly meet the critique (to leave it aboveground until a better solution is found), is that *OPG has a responsibility to take care of the waste now rather than leave it to future generations* – two thirds of those who agree with critique find this normative position a strong argument.



Rebuttals to Better Option Critique

Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

International experts find that it is much safer to bury waste deep underground than to let it sit aboveground where it is vulnerable to weather and other hazards.

Strongly support DGR



Somewhat support DGR



Somewhat oppose DGR



Strongly oppose DGR



OPG wants to take responsibility for the waste now, rather than passing it on to the future generations.

Strongly support DGR



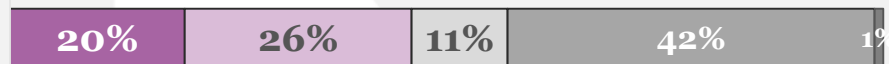
Somewhat support DGR



Somewhat oppose DGR



Strongly oppose DGR



■ Very strong ■ Somewhat strong □ Somewhat weak ■ Very weak ■ Don't know

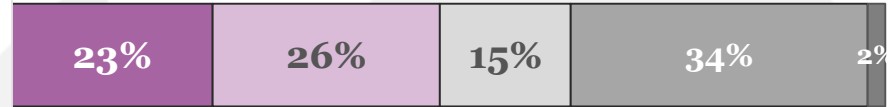


Rebuttals to Better Option Critique

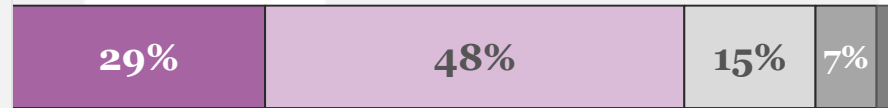
Now, I'd like to know if you think each of the following is a very strong argument, somewhat strong argument, somewhat weak argument or very weak argument against this critique.

International experts find that it is much safer to bury waste deep underground than to let it sit aboveground where it is vulnerable to weather and other hazards.

Strong agree w critique

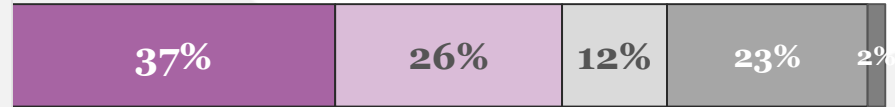


Somewhat agree w critique

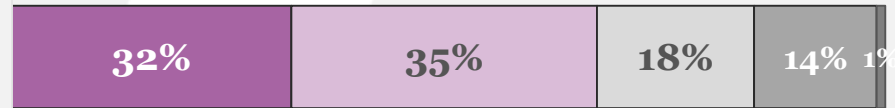


OPG wants to take responsibility for the waste now, rather than passing it on to the future generations.

Strong agree w critique



Somewhat agree w critique



■ Very strong ■ Somewhat strong □ Somewhat weak ■ Very weak ■ Don't know



Ontarians were asked to respond to a variety of position statements in favour of the DGR.

The most broadly resonant statement is that:

- *Ontarians have a responsibility to future generations to store nuclear waste in the safest most secure manner possible now (94% agree)*

A vast majority also agree that:

- DGR should be built sooner rather than later (76% agree)
- The DGR is safer than the way waste is currently being stored (76% agree)

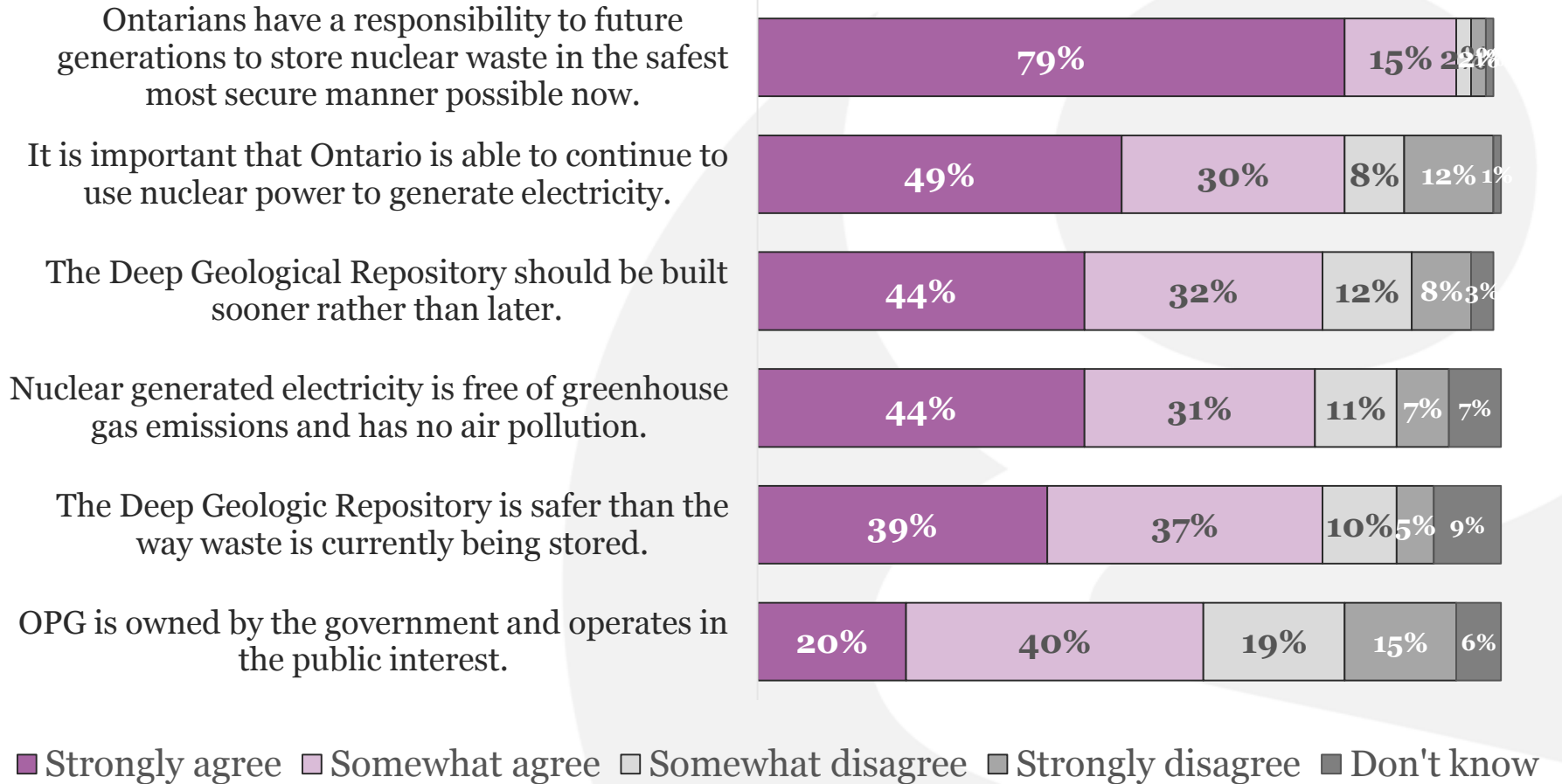
And Ontarians are supportive of the continued use of nuclear energy:

- It is important that Ontario is able to continue to use nuclear power to generate electricity (79% agree)
- Nuclear generated electricity is free of greenhouse gas emissions and has no air pollution (75%)

Far fewer agree (60%) OPG is owned by the government and operates in the public interest.



Do you strongly agree, somewhat agree, somewhat disagree or strongly disagree with this argument?





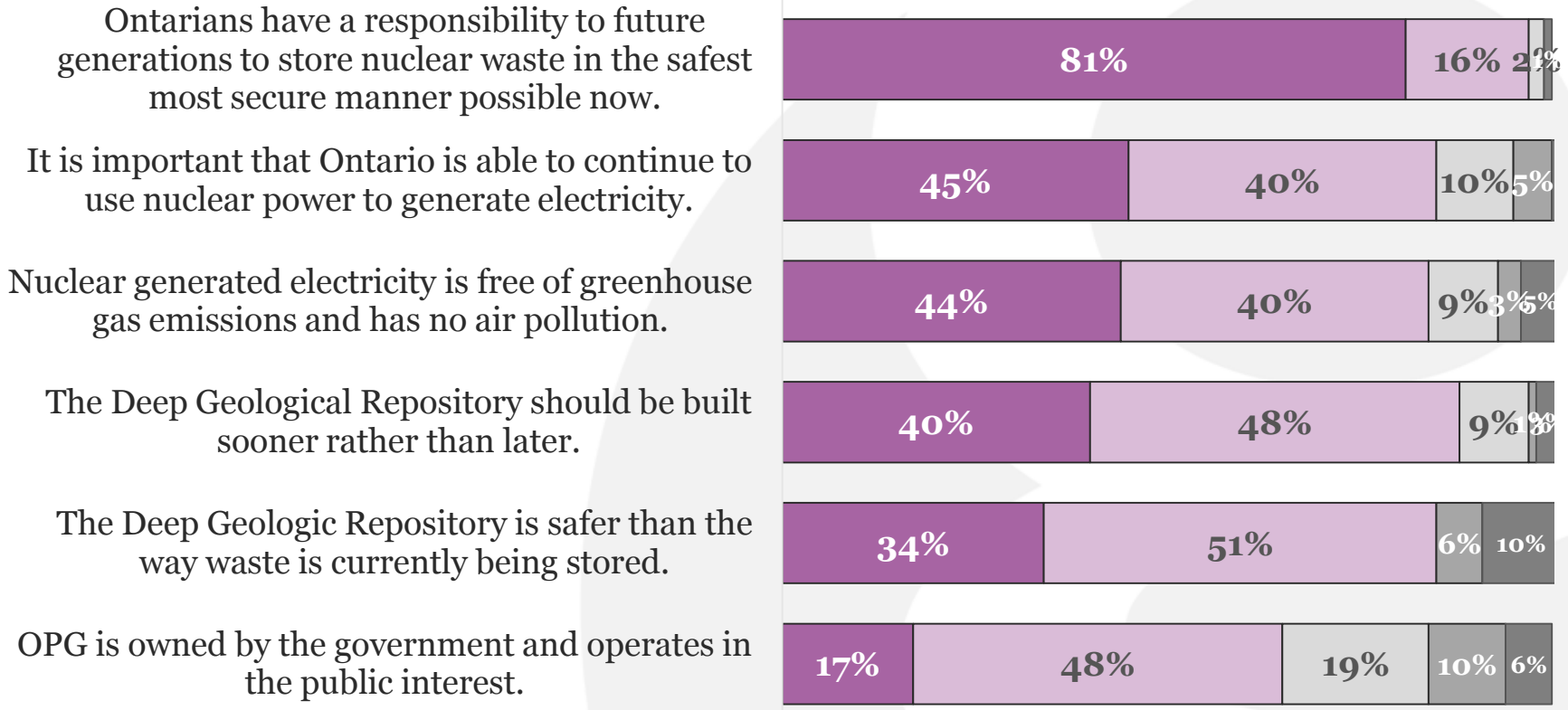
Meta Narrative –Soft Supporters

The overwhelming meta position is that OPG (we) have a responsibility to future generations store the waste in the safest manner we know how right now. It doesn't require absolutes, it does acknowledge that we should be doing the best in the moment.

- Virtually all soft supporters agree that we have a responsibility to store this waste as safely as we can now.
- Virtually all believe that we should proceed with the DGR sooner rather than later
- Virtually all are supporters of nuclear energy
- Virtually all agree that it is safer than the current method of storage



Do you strongly agree, somewhat agree, somewhat disagree or strongly disagree with this argument?
[those that somewhat support DGR after description, n=304]



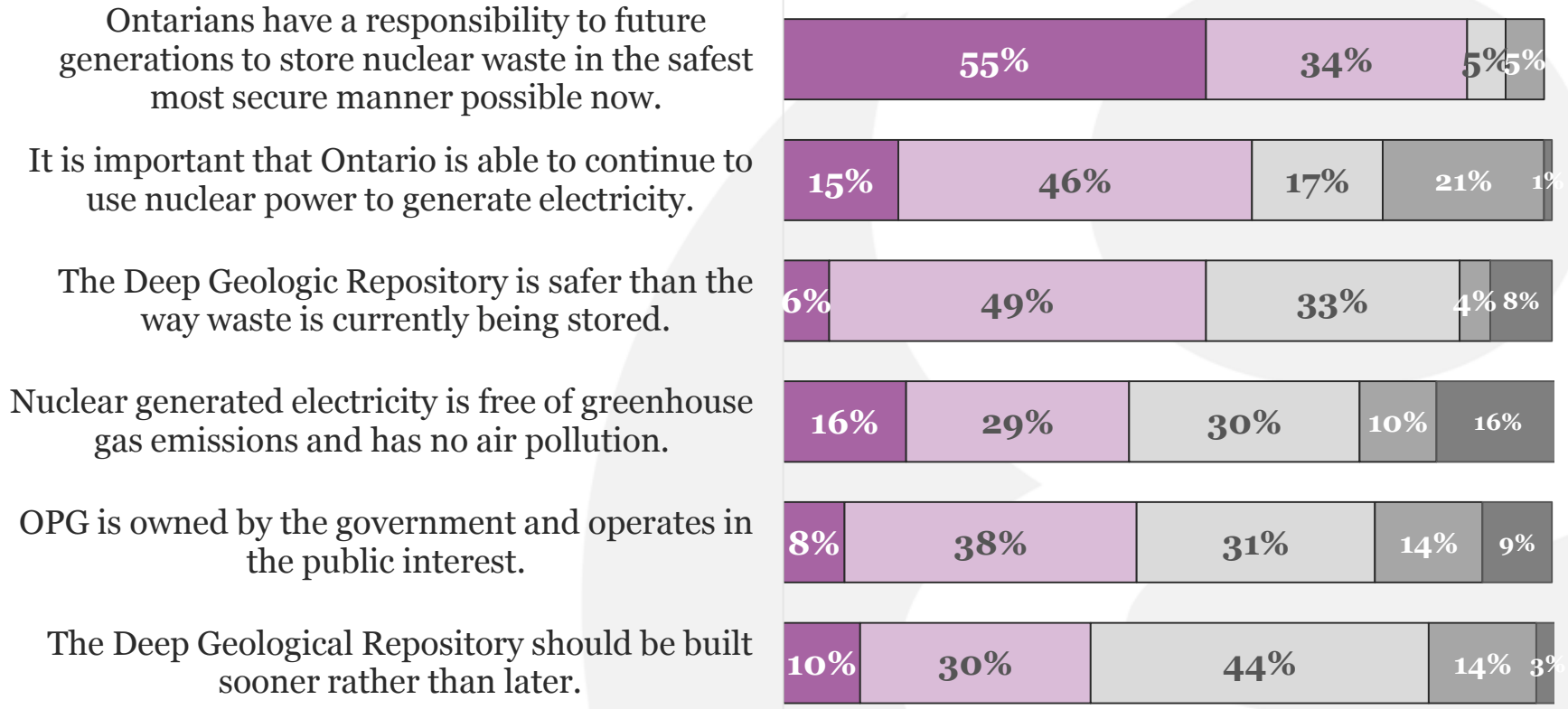
■ Strongly agree ■ Somewhat agree ■ Somewhat disagree ■ Strongly disagree ■ Don't know



- ❑ Soft opponents respond to the idea that we are responsible to future generations for doing the best we can now. Virtually all soft opponents believe it is incumbent on us to store it as safely as we can.
- ❑ But just over half (55%) believe that the DGR is safer than the current method of storage
- ❑ And only 40% believe we should proceed sooner rather than later. This is an additional 5% of Ontarians.



Do you strongly agree, somewhat agree, somewhat disagree or strongly disagree with this argument?
[those that somewhat oppose DGR after description, n=111]



■ Strongly agree ■ Somewhat agree ■ Somewhat disagree ■ Strongly disagree ■ Don't know



Support After All Arguments

After hearing all the criticisms and rebuttals, support for the DGR changed very little, with 71% supporting the proposed DGR and 27% being opposed.

- There was a 4% increase in strong support.
- There was no increase in strong opposition.

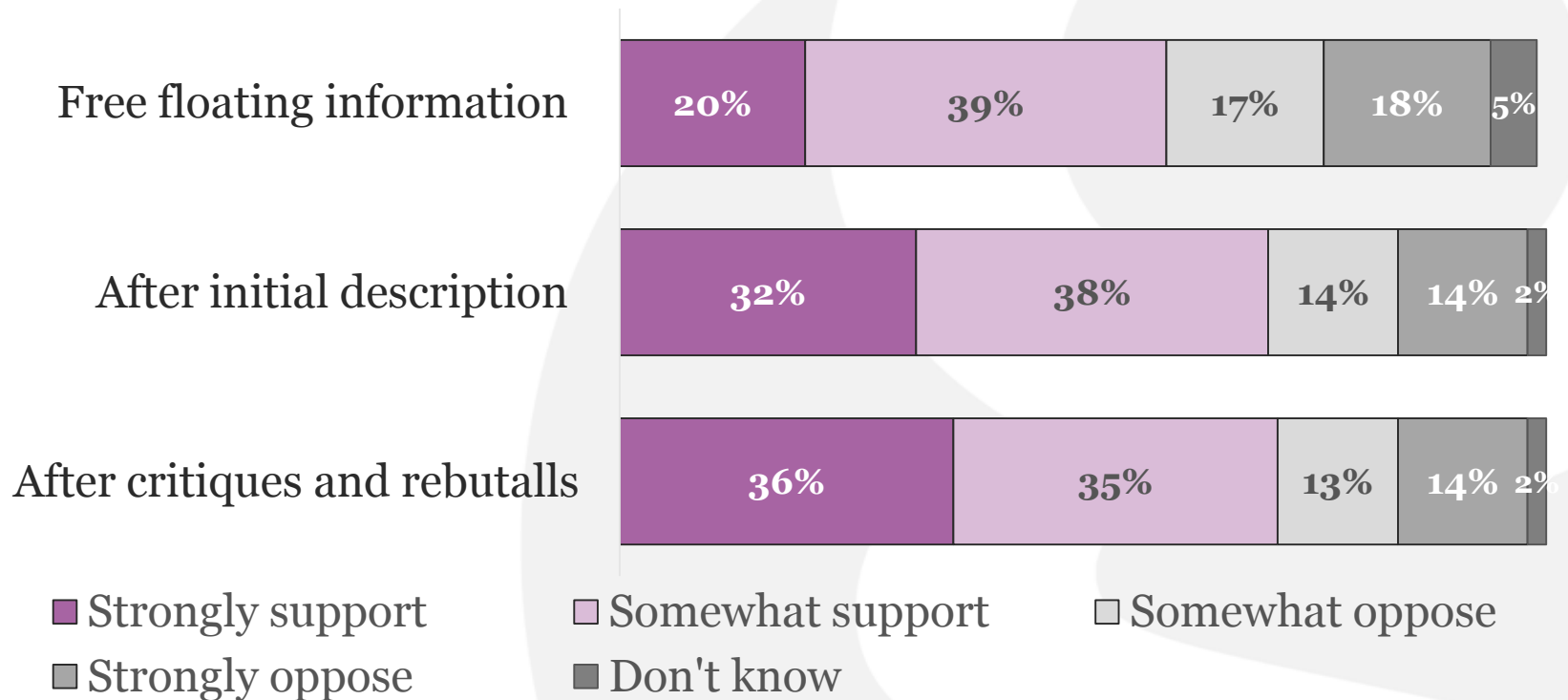
By far the most common reason to support the DGR is that it is the safest option available (70%).

The most common reason to oppose the DGR is because of environmental concerns (63%).



Support After All Arguments

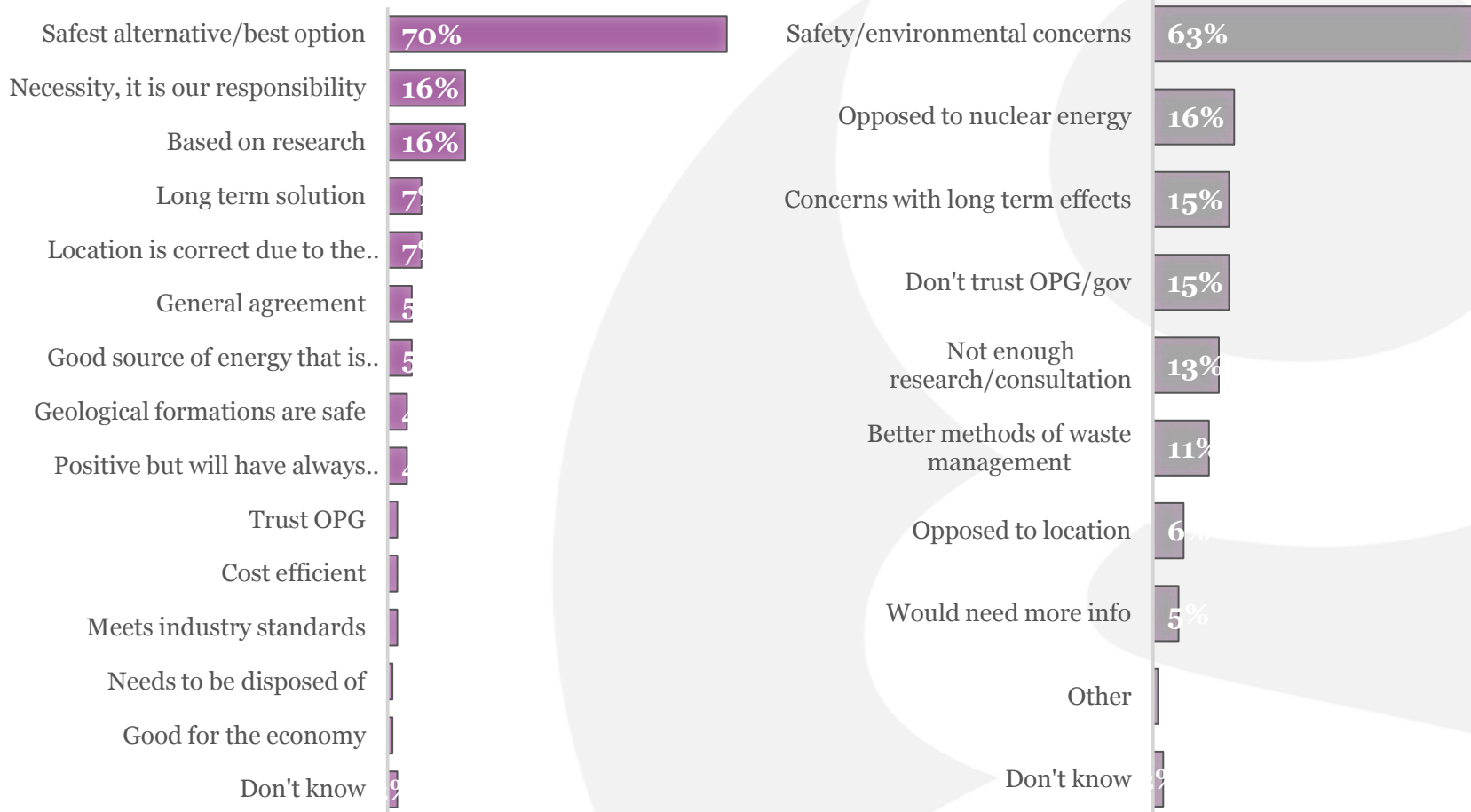
Again, after hearing all of this information, would you say that you strongly support, somewhat support, somewhat oppose, or strongly oppose the proposed Deep Geologic Repository being built in Kincardine, Ontario?





Reasons to Support/Oppose DGR

Why do you support/oppose the Deep Geologic Repository?
[those that support the DGR, n=569; those that oppose the DGR, n=218]





Trust in “cue” groups

International scientists who work in the field of nuclear waste storage are the most trusted source on this issue, with 92% strongly trusting them.

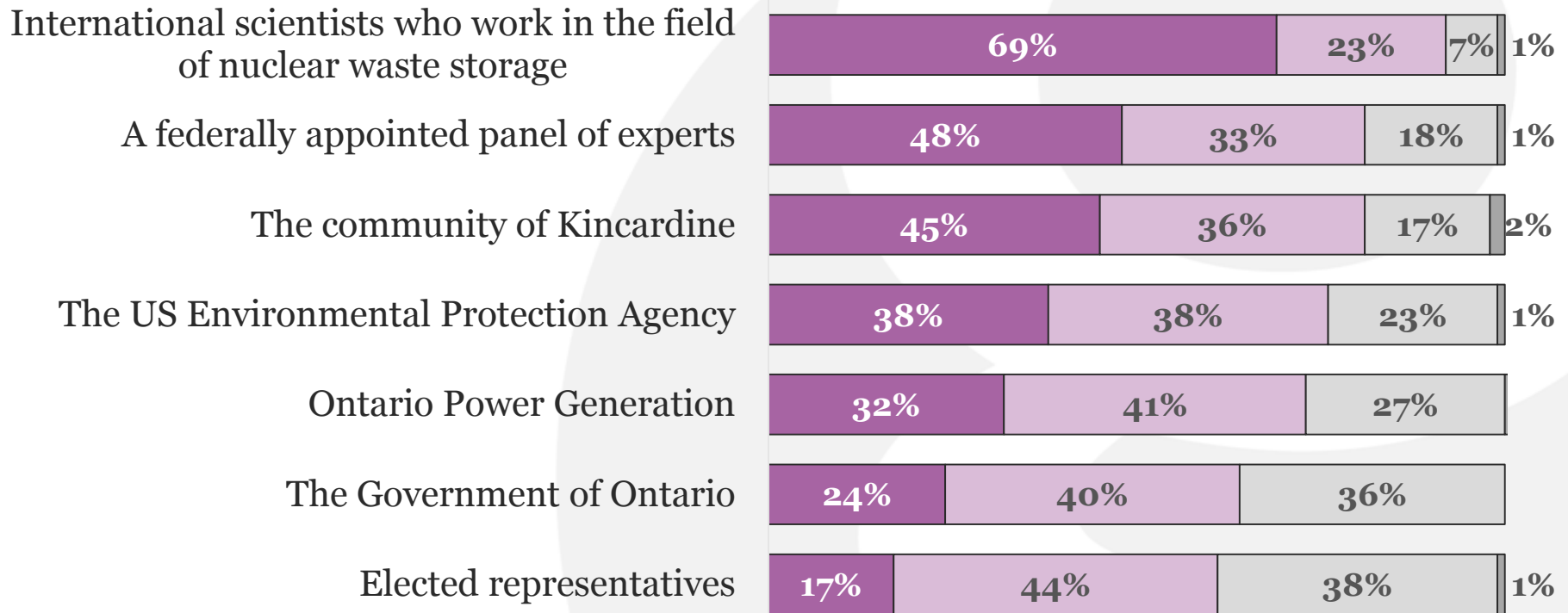
A federally appointed panel of experts and the community of Kincardine are both trusted by 81% of Ontarians.

Next most trusted is the US Environmental Protection Agency (76%), followed by OPG (73%).

The Government of Ontario and elected representatives are the least trusted, with more than 1 in 3 saying they do not trust them at all.



Finally, please tell us how much you trust information from each of the following when discussing the DGR. Please use a scale of one to nine where one means you strongly distrust advice or information from this source and nine means that you strongly trust advice or information from this source.



■ Strongly trust (7-9) ■ Somewhat trust (4-6) ■ Strongly distrust (1-3) ■ Don't know



Ontarians know little about how nuclear waste is currently stored or OPG's proposed Deep Geological Repository.

In fact, Ontarians are most likely to believe that the waste is currently being stored underground than above ground. This either allows the DGR to be a *fait accompli* or a good policy enacted too late given its advantages over current storage.

The most critical way to frame the DGR is as an *internationally, scientifically optimal method of storage* to protect human and environmental health. It is a step forward – more secure and more safe than current storage methods. It is our *responsibility to store the waste as safely as we can now* - and the DGR is that method. International nuclear and geological scientists have selected this location as ideal. It is best to make it the logical next step, not a revolution.

Kincardine's community support is important but not as a reason for location (least resistance). Not needing to transport most of the waste is an advantage but not a reason for this location (convenience). Additionally, raising the transportation as a risk to be mitigated means that transportation of any waste is positioned as risky.



For the most part, opposition is related to local environmental concerns (threat to water, etc.), rather than thinking OPG can't be trusted to complete a project of this type, or being fundamentally opposed to nuclear energy.

There are essentially 3 key justifications for the DGR that should be communicated to Ontarians:

1. The science is sound and this location and type of storage is endorsed broadly by experts;
2. This is the best solution available, and better than the status quo; and
3. We have a responsibility to future generations to take care of this now.

The movable middles are slightly different in responses to messages:

- The soft supporters are very receptive to messages of scientific decision making and that DGR is superior to current methods of storage.
- The soft opponents are more receptive to normative arguments (we have a responsibility) and to risk mitigation – more secure and safe than current methods. However, science is not unimportant to this group as the basis for safe and secure.



the **gandalf** group

For more information contact:
Jennifer Espey, Principal Partner
Espey@gandalfgroup.ca

THANK YOU

420 Wellington Street West
Toronto, Ontario M5V1E3
T: 416.644.4120 | F: 416.644.4121
www.gandalfgroup.ca