

# Nuclear Energy

*A review of publicly available data indicates that Canadians have been quite resilient in their support for nuclear and the most recent issues are unlikely to seriously dampen long-term support. We speculate that despite the potential for public opposition, an elite consensus around nuclear power may be reducing the mobilization of the underlying “safety” induced concerns about nuclear power.*

## The Issue

A crisis at a nuclear power plant (Japan), occurred just as Canada and the United States are in the process of launching processes to build the first North American nuclear reactors since Chernobyl. Since then Germany has announced an intention to withdraw from the nuclear power game and Italians have defeated a plan to build nuclear power plants.

Nuclear power represents a major share of electricity generation in Canada and the United States so public support for its continued use and the addition of new supply are critical.

### Key Events

1958 - First Commercial nuclear power plant opens in United States

March 28, 1979 - Three Mile Island Accident

April 26, 1986 - Chernobyl accident

March 11, 2011—Earthquake and Tsunami hit Japan and damage two reactors in Fukushima.

## Understanding the Environment... Nuclear Energy Debates

No doubt nuclear energy has always been a public policy challenge. While nuclear provides a major share<sup>1</sup> of Canadian electricity, it is not without its critics. Two of the most obvious criticisms are (1) it is impossible to reduce the chance of a major problem to zero and even one major problem would be catastrophic; and, (2) nuclear energy leaves a legacy of nuclear waste that will represent a major environmental challenge sometime in the future.

On the first, there are the obvious examples when things did go wrong, including the accidents at Three Mile Island (1979), Chernobyl (1986) and now Fukushima (2011). On the second, it is significant that most reactors are also storage facilities for considerable stockpiles of waste that are at risk of contributing to the magnitude of a nuclear accident.

<sup>1</sup> Nuclear provides about 50% of Ontario’s energy and 15% of all of Canada’s energy.  
[http://www.cna.ca/english/nuclear\\_facts/quick\\_facts.html](http://www.cna.ca/english/nuclear_facts/quick_facts.html)

But both of these issue-based objections are probably secondary to the likelihood that the public perspective on nuclear will reflect deep seated fear. In fact, while both Canada and the United States have significant nuclear power generation capabilities, there has been little serious public policy talk about expanding the nuclear generation output for decades.

*"Of the 104 plants now operating [in the United States], ground was broken on all of them in 1974 or earlier"<sup>2</sup>*

How then will the public respond to the current crisis? Will it lead to increased public outcry? At present, despite an on-going public consultation at the Darlington plant in Ontario about future reactors, the opposition has been confined to small organized groups.

From a public opinion perspective three potential reactions may occur:

- A spike in opposition to nuclear which dissipates over the short-term as the news cycle moves to other issues;
- A rise in concern about a nuclear threat but no heightened opposition to new builds;
- A dramatic rise in opposition to nuclear and greater willingness to accept the anti-nuclear arguments about the environmental dangers of nuclear.

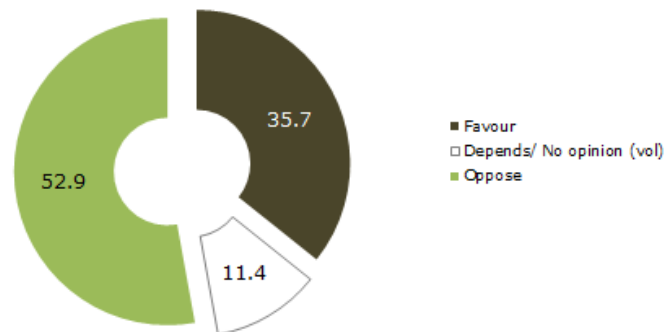
Fortunately, we have considerable public opinion data spanning from the early 1980s to 2010 to help us understand public support for nuclear (and how it has evolved) over time.

## Early Period: Three Mile Island and Chernobyl

In 1980, Decima asked Canadians about the building of new nuclear power plants and public opinion was demonstrably offside. Just 36 per cent were in favour compared with 53 per cent who were opposed. Since the Three Mile Island accident was only the year before it may be surprising that there were not more opponents. Opposing a risky enterprise is easier when the consequences of doing so are easy to imagine.

### Constructing New Nuclear Plants – 1980

Q. Would you favour or oppose the construction of more nuclear plants in Canada?



Source: Decima Quarterly [computer file]. Canadian Opinion Research Archive, Queen's University, Kingston, ON, June 1980



<sup>2</sup> Matthew Wald, (December 7, 2010, Nuclear 'Renaissance' Is Short on Largess <http://green.blogs.nytimes.com/2010/12/07/nuclear-renaissance-is-short-on-largess/>)

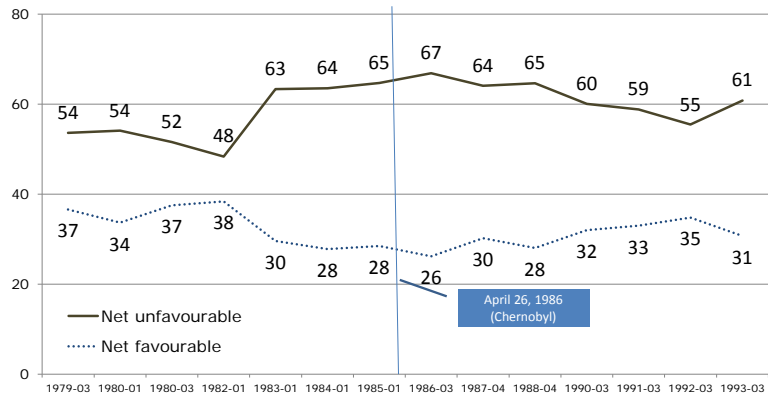
Looking back, we would imagine that distance from Three Mile Island would reduce opposition to building nuclear plants until Chernobyl. You would expect public opinion might again turn against nuclear by that time.

The evidence, from two different questions over time, suggests that opposition to nuclear energy actually rose somewhat in the early-80s before falling back somewhat as the 90s began.

The question of constructing new facilities clearly shows a dramatic change between 1982 and 1983. Across that year, opposition rose from 48 to 63 per cent. *Surprisingly, there is no Chernobyl effect evident here!*

### Constructing New Nuclear Stations 1979-1993

Q. At present, would you say you are very favourable, somewhat favourable, somewhat unfavourable or very unfavourable to the construction of new nuclear stations in Canada?



(Source: Environics Focus Canada, Canada [computer file]. Environics Research Group, Toronto, ON, Canadian Opinion Research Archive, Queen's University, Kingston, ON)



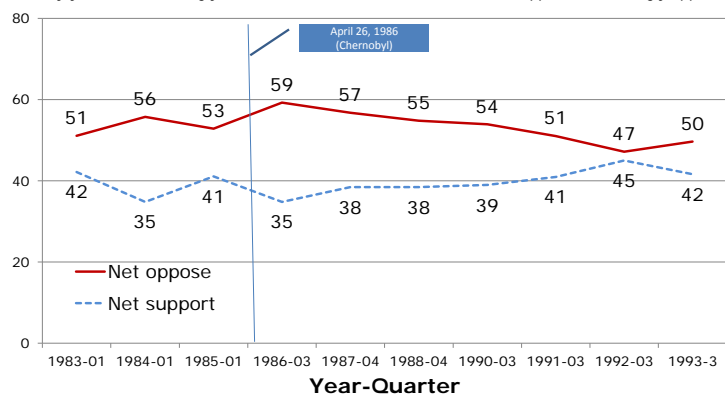
It is worth noting that when this same question was posed by Environics in 2003, the proportion of Canadians willing to support new construction was low but higher than anytime in the 1990s (40%).

But support for new construction may not be the best indicator of overall confidence in the system. For that we turn to another indicator - support for using nuclear power - asked across the same time span. Here, we find a modest Chernobyl effect but it is surprisingly muted.

After Chernobyl, we do find that opposition decays. By 1992, opponents just nudged out supporters (47% to 45%).

### Support for Using Nuclear Power 1983-1993

Q. What is your opinion about the use of nuclear power for the generation of electricity? Would you say you are . . . Strongly in favour, somewhat in favour, somewhat opposed, or strongly opposed?



(Sources: Environics Focus Canada [computer file]. Environics Research Group, Toronto, ON, Canadian Opinion Research Archive, Queen's University, Kingston, ON)



The pattern indicates the possibility that Canadians might be persuaded over time to support nuclear as long as we continue to have uninterrupted periods of nuclear safety.

As we discuss later, a 2003 poll by Environics seemed to suggest that the public was more open than ever before to nuclear energy with almost half supporting this method.

## A Nuclear Renaissance?

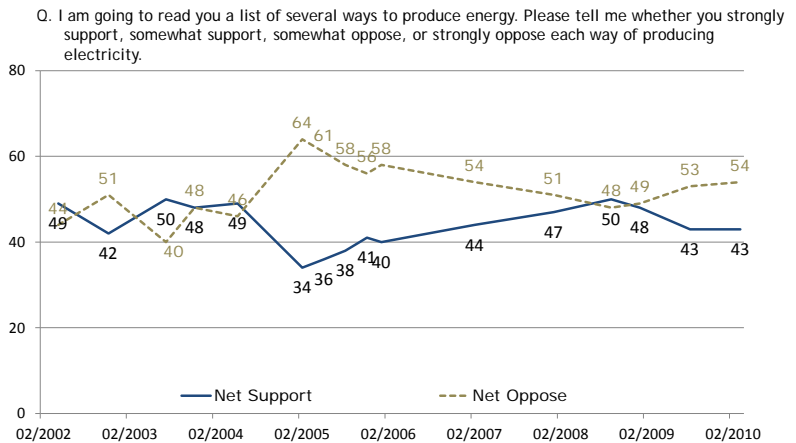
A number of countries, including Canada, have plans for new nuclear power plants and this raises the question, has there been a nuclear renaissance? Has the public moved on-side with nuclear as a source of power.

For the past eight years, the Canadian Nuclear Association has conducted regular surveys on Canadian attitudes about nuclear power.

The pattern is striking and puzzling. Between 2002 and 2004, public opinion was divided but supporters actually outnumbered opponents in some surveys. This is consistent with the Environics survey discussed earlier.

That dramatically changed in 2005. Opposition rose to very high levels before gradually (over several years returning to a balanced position in 2009. In 2010, opposition was again, higher than support.

Support for Nuclear Power (2002-2010)



(Source: Canadian Nuclear Association. Surveys conducted by Ipsos Reid. [http://www.cna.ca/english/studies\\_reports/public\\_opinion.html](http://www.cna.ca/english/studies_reports/public_opinion.html))

What drove the rise in nuclear concern? It clearly was not a rogue survey since it persisted for a year. There were no major accidents of the scale of Chernobyl to explain the change. While we cannot discount a methodological change (e.g. change in the questionnaire), there were a number of issues that might have driven concern with nuclear energy:

- the nuclear ambitions of countries like (North Korea) were in the news;
- public concern with the environment was growing; and,
- debate had started about the future of electricity power generation.

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The public has always been divided about the use of nuclear power in Canada. While public support tends to strengthen in the absence of a recent salient issue, there can be significant drops in support when the issue is on the public mind. Perhaps, because it rarely gets there for positive reasons.

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It is also worth noting that support for nuclear power is much higher among men, and those with higher education and higher incomes. Ontario (56%, in March of 2010) is the province that is the most supportive and Quebec (18%) is the least supportive.

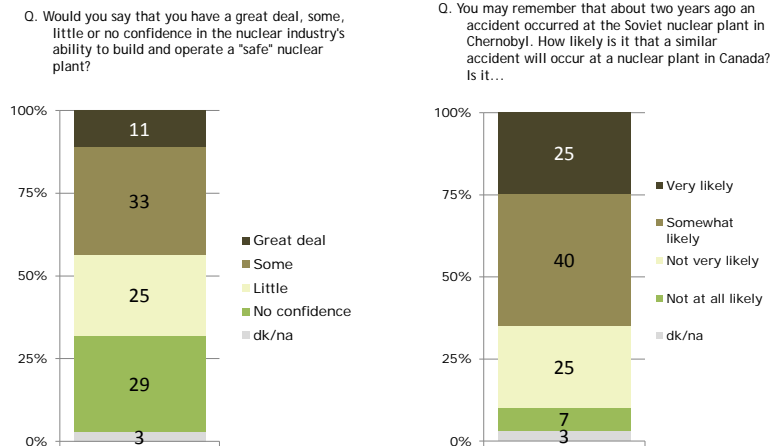
## The Safety of Nuclear

Safety concerns should, in theory, explain public support/ opposition to nuclear. A Decima survey just months after the Chernobyl disaster found that 64% think that nuclear power is somewhat safe or very safe (48% very). So while not universal, more people thought nuclear was safe than supported it use.

Other polling highlighted the deep seated worry about nuclear among the public. Consider two findings from a survey conducted by Environics at the end of 1987:

- Only 44% had a great deal or some confidence in our ability to build and operate a “safe” nuclear power plan.
- 25% felt that it was very likely that there would be a Canadian accident similar to Chernobyl.

### Post-Chernobyl Response– 1987



Source: Environics Focus Canada Report [computer file]. Canadian Opinion Research Archive.

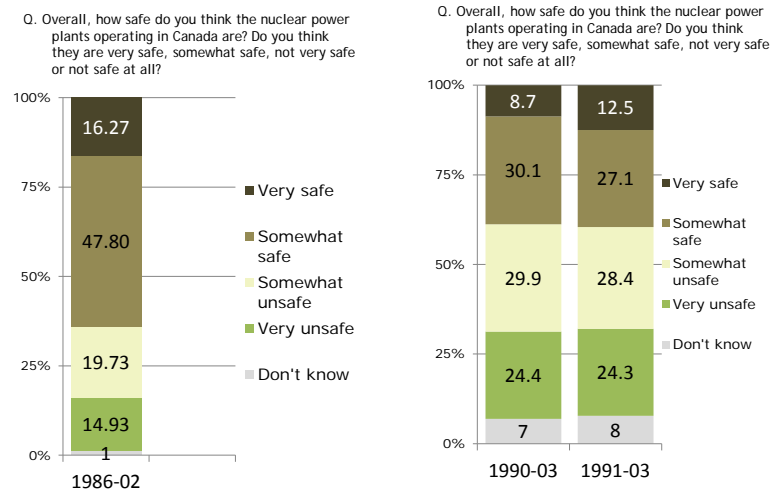
In 1986, 17 per cent of Canadians felt that nuclear power was very safe, which was balanced by 15 per cent who felt it was very unsafe. The lean was in the safe direction (48% somewhat safe) but there was clearly underlying concern.

Subsequent polling in the early 1990s suggested that safety concerns continued to dominate.

In 1991, the polls showed 13% thought nuclear power plants are very safe and 27% thought them to be somewhat safe (40% overall). The balance of opinion was somewhat negative and a significant 24 per cent took the view that nuclear power is very unsafe.

We don't have a publicly available measure of perceived safety asked in this manner since 1991 so it is unclear how this measure has moved. We do, however, have some other measures of safety.

### Nuclear Plant Safety in Canada – 1986, 1990, 1991

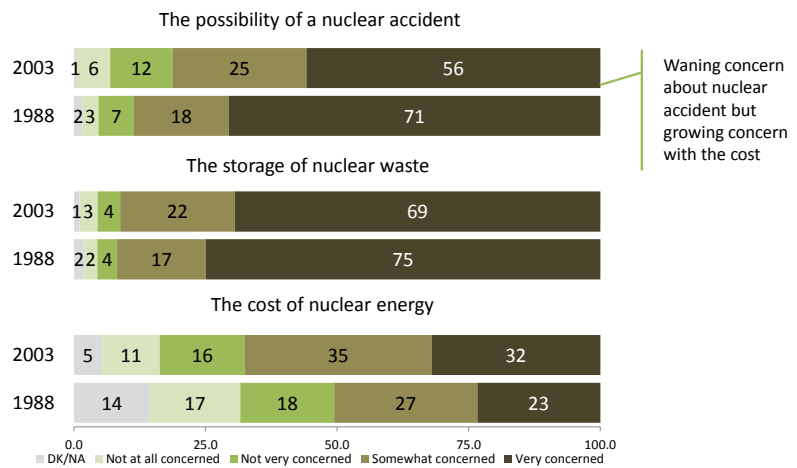


(Source: 1986 (June), Decima Quarterly [computer file]. 1990 and 1991, Environics Focus Canada [computer file]. Canadian Opinion Research Archive, Queen's University, Kingston, ON. June 1986)

Although safety is always a front-and-centre issue for the industry, its salience for Canadians did change over time. A good way to understand this change is how safety evolved compared with other concerns.

Between 1988 and 2003s, public concern with safety, as evidence by their concern with the possibility of an accident, did decline. The reduced concern with the possibility of an accident may, account for the increasing support for nuclear over the 1990s.

## Concerns with Nuclear Energy (1988-2003)



(Sources: Environics Focus Canada [computer file], Environics Research Group, Toronto, ON, Canadian Opinion Research Archive, Queen's University, Kingston, ON)

- By 2003 only 56% were very concerned about a nuclear accident compared with 71% (a decline of 15 points) in 1988.
- On the other hand, concerns with cost increased significantly across the period: from 23% very concerned to 32% (from 50% to 67% who were very or somewhat concerned).

Probably because of the absence of information to the contrary Canadians became less concerned about an accident, but there is, nevertheless, a deep rooted concern about nuclear safety.

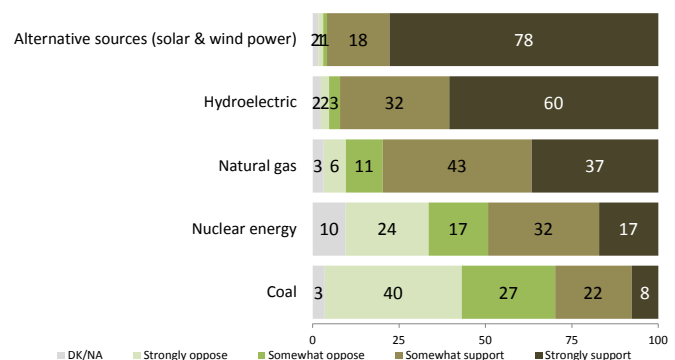
## Nuclear versus the Rest

No energy generation method is completely free of issues and, perhaps, the best way to understand public support for nuclear is in light of the alternatives. In this light nuclear stacks up, particularly, well against coal but is far less supported than alternatives like wind and solar, hydroelectric and natural gas.

In 2003, coal was the least supported of five sources of energy (30% support and 67% oppose). Comparatively, nuclear is much more supported (49% support and 41%

## Nuclear Compared with other Sources (2003)

In general, do you strongly support, somewhat support, somewhat oppose or strongly oppose the use of each of the following as one of the ways to provide electricity for Canada? How about ?



(Sources: Environics Focus Canada [computer file], Environics Research Group, Toronto, ON, Canadian Opinion Research Archive, Queen's University, Kingston, ON)

oppose). The 2003 findings are consistent with the results from the Nuclear Association of Canada polling from 2005 to 2010.

## Conclusions and Implications

### Even as the best of times...

Despite Canada's long history with nuclear power as a significant source of power, Canadians have never fully embraced it. As late as March of 2010, 15 per cent were strongly supportive and 43 per cent were somewhat or strongly supportive. At its high points, never more than half of Canadians have embraced it. The only exception is really Ontario where in March of 2010, 56 per cent supported nuclear power.

At the same time, major events in the rest of the world have not particularly derailed nuclear power support in Canada at this time. One expects that this will continue despite the recent events in Japan and the subsequent decisions to avoid nuclear power in European countries.

Nuclear power does outshine one other energy source: coal. This speaks to the effectiveness of the message, echoed by many, that coal is a *dirty* energy.

### Nuclear is interesting policy issue because...

Canada's decision to maintain and embark on further nuclear power development is interesting for three reasons and speaks directly to the role of policy leadership. Consider that:

- Canadians are more opposed to it than supportive;
- There are international events that stoke fear;
- It is a potentially explosive public issue.

The conditions seem ripe to mobilize major opposition but so far this has not occurred. One wonders if this is a reflection of a deep trust by the public or an elite consensus that nuclear energy should be supported.

## Data in this Report

The analysis in this paper is based on public opinion that is in the public domain and the original authors of the studies bear no responsibility for the analysis and interpretation presented.

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## Support for Nuclear as Way to Produce Electricity (Environics)

Field Period	Strongly support	Somewhat support	Somewhat oppose	Strongly oppose	Don't know	n
1983-01	12.5	29.7	21.4	29.7	6.7	2017
1984-01	8.4	26.5	28.0	27.8	9.4	2010
1985-01	10.0	31.1	24.5	28.3	6.1	2020
1986-03	7.3	27.6	23.6	35.7	5.9	2039
1987-04	8.5	29.9	26.0	30.8	4.8	2015
1988-04	10.5	28.0	23.4	31.4	6.8	2021
1990-03	9.1	29.8	26.5	27.4	7.1	2028
1991-03	10.3	30.6	24.1	26.9	8.1	2012
1992-03	12.4	32.6	22.6	24.5	7.8	2019
1993-03	10.6	31.0	21.6	28.0	8.7	2001

Q: I am going to read you a list of several ways to produce energy. Please tell me whether you strongly support, somewhat support, somewhat oppose, or strongly oppose each way of producing electricity.  
*Source:* Environics Focus Canada.

## Support for Nuclear as Way to Produce Electricity (Ipsos)

Field Period	Strongly support	Somewhat support	Somewhat oppose	Strongly oppose	Don't know	n
Mar-10	15	28	22	32	3	1158
Aug-09	16	27	22	31	4	1156
Jan-09	16	32	21	28	3	2200
Sep-08	18	32	20	28	2	1285
Jan-08	16	31	22	29	2	2187
Feb-07	15	29	22	32	2	2123
Jan-06	13	27	18	40	2	1000
Nov-05	12	29	19	37	3	1000
Aug-05	13	25	21	37	4	1000
1May-05	9	27	22	39	3	1000
Feb-05	9	25	23	41	2	1820
May-04	15	34	21	25	5	2207
Nov-03	15	33	20	28	4	1056
Jul-03	17	33	17	23	10	n/a
Nov-02	12	30	18	33	7	n/a
Apr-02	13	36	22	22	7	n/a

Q: I am going to read you a list of several ways to produce energy. Please tell me whether you strongly support, somewhat support, somewhat oppose, or strongly oppose each way of producing electricity.  
*Source:* Canadian Nuclear Association. November and April 2002 were conducted by Environics



## Support for Construction of New Nuclear Stations (Environics)

Field Period	Strongly support	Somewhat support	Somewhat oppose	Strongly oppose	It depends	Don't know
1979-03	9.5	27.0	21.0	32.6	4.9	4.9
1980-01	9.5	24.2	20.1	34.0	5.2	7.1
1980-03	11.1	26.4	19.5	32.1	3.0	7.9
1982-01	12.3	26.0	20.1	28.3	5.3	8.0
1983-01	8.6	21.0	18.0	45.3	3.1	4.0
1984-01	6.6	21.1	21.7	41.8	3.4	5.3
1985-01	7.2	21.3	18.8	45.9	3.7	3.2
1986-03	6.4	19.7	21.4	45.4	3.2	3.8
1987-04	6.8	23.4	24.0	40.1	3.0	2.7
1988-04	7.1	20.9	22.3	42.3	3.5	3.8
1990-03	7.1	24.8	25.3	34.7	2.6	5.4
1991-03	9.0	24.0	21.6	37.2	3.9	4.3
1992-03	8.8	26.0	21.0	34.4	3.6	6.2
1993-03	7.5	23.1	22.2	38.6	3.1	5.4
2003-04	12.1	28.0	26.2	30.1	0.7	2.8

Q: At present, would you say that you are very favourable, somewhat favourable, somewhat unfavourable or very unfavourable to the construction of new nuclear stations in Canada?

Source: Environics Focus Canada

## Construction of New Nuclear Plants, 1980 (Decima)

Field Period	Favour	Depends/ No opinion (vol)	Oppose	n
1980-02	35.7	11.4	52.9	1500

Q: Would you favour or oppose the construction of more nuclear plants in Canada?

Source: Decima Quarterly

## Safety of Nuclear Power, 1986 (Decima)

Field Period	Very safe	Somewhat safe	Not very safe	Not safe at all	No opinion	n
June 1986	16.3	47.8	19.7	14.9	1.3	1500

Q: Overall, how safe do you think the nuclear power plants operating in Canada are? Do you think they are very safe, somewhat safe, not very safe or not safe at all?

Source: Decima Quarterly

## Safety of Nuclear Power, 1990-91 (Environics)

Field Period	Very safe	Somewhat safe	Somewhat unsafe	Very unsafe	Don't know	n
1990-03	8.7	30.1	29.9	24.4	6.9	2029
1991-03	12.5	27.1	28.4	24.3	7.8	2012

Q: In your opinion, are nuclear power plants very safe, somewhat safe, somewhat unsafe, or very unsafe?

Source: Environics Focus Canada

## Confidence in Nuclear Power, 1987 (Environics)

Field Period	Great deal	Some	Little	No confidence	Don't know	n
1987-04	11.0	32.5	24.7	29.0	2.7	2013

Q: Would you say that you have a great deal, some, little or no confidence in the nuclear industry's ability to build and operate a "safe" nuclear plant?

Source: Environics Focus Canada

## Likelihood of Accident Similiar to Chernobyl, 1987 (Environics)

Field Period	Very likely	Somewhat likely	Not very likely	Not at all likely	Don't know	n
1987-04	24.7	40.1	25.1	6.8	3.2	2015

Q: You may remember that about two years ago an accident occurred at the Soviet nuclear plant in Chernobyl. How likely is it that a similar accident will occur at a nuclear plant in Canada? Is it...

Source: Environics Focus Canada

## Likelihood that a Nuclear Plant will Blow up, 1983 (Environics)

Field Period	Very likely	Somewhat likely	Somewhat unlikely	Very unlikely	Don't know	n
1983-01	23	41	18	11	6	2017

Q: For each of the following, please tell me whether you think it is very likely, somewhat likely, somewhat unlikely or very unlikely. That at some time, a nuclear power plant will blow up.

Source: Environics Focus Canada

## Concerns with Nuclear, 1988-2003 (Environics)

Field Period	Don't know	Not at all concerned	Not very concerned	Somewhat concerned	Very concerned	n
<i>Cost of Nuclear Power</i>						
1988-04	14.4	17.2	17.8	27.2	23.4	2022
2003-04	5.4	10.9	16.1	35.5	32.1	2002
<i>The storage of nuclear waste</i>						
1988-04	2.0	2.5	3.8	16.9	74.9	2022
2003-04	1.0	3.5	4.3	21.8	69.4	2002
<i>The possibility of a nuclear accident</i>						
1988-04	1.6	3.0	6.8	18.0	70.6	2022
2003-04	0.6	6.3	11.9	25.4	55.8	2002

Q: How concerned are you with each of the following aspects of nuclear power. Are you very concerned, somewhat concerned, not very concerned or not at all concerned about the cost of nuclear energy?

Source: Environics Focus Canada

## Confidence in System to deal with Nuclear Waste, 2003 (Environics)

Field Period	Very confident	Somewhat confident	Not very confident	Not at all confident	DK/NA	n
2003-02	6.9	28.8	30.5	25.8	7.9	2018

Q: In general, would you say that you are very, somewhat, not very, or not at all confident that the authorities responsible for nuclear waste have a good system in place to deal with it?

Source: Environics Focus Canada