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# Report about the Canadian Solar Thermal Market Survey

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## **Part 1: Description of survey**

### **Design of survey**

This report provides the results of a survey of the solar thermal industry in Canada covering the calendar year of 2022 and 2023. The survey was commissioned by CanmetENERGY of Natural Resources Canada (NRCan) and was undertaken by solrico, a German agency for market research and international communication in the solar thermal sector. This survey is a continuation of annual surveys going back to 2002.

However, this is the first year that the German agency solrico has conducted this survey. Therefore, there have been a number of changes in the database of the surveyed companies, but also in the questionnaire. The last few years have shown that fewer and fewer companies took part in the survey, even though a large number of companies were contacted. This trend should be reversed by the following measures:

- Identifying a list of relevant market players as well as their correct responsible contact person so that a high response rate can be achieved.
- Widening the categories of surveyed solar thermal industry players adding new collector technologies such as PVT and concentrating collectors.
- Shortening the questionnaire so that filling in the survey can be done with a reasonable effort (this year's questionnaire had 4 pages compared to the 9 pages in the previous years).
- Aligning the requested figures in the questionnaire with the data necessary for the international organisations like IEA Solar Heating and Cooling Programme (IEA SHC) and IEA.
- Elaborating market trends by adding open and multiple choice questions to the questionnaire so that the results of the survey have strategic importance for company representatives with the aim of increasing the motivation to take part in the annual survey in the long-run.

### **Description of the final company database**

The updated database of relevant companies in the solar thermal sector now includes 21 companies that all have received the questionnaire in February 2024. You find the final survey with only four pages in the Annex (part 4). The companies can be categorized as following:

- Four manufacturers of solar air heating systems
- Two manufacturers of flat plate collectors
- Four manufacturers / suppliers of concentrating solar collectors
- Three manufacturers and importers of unglazed solar pool heating collectors
- Two importers of PVT collectors
- Six importers/resellers of evacuated tube and/or flat plate collectors

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| Company   | Prov | Website   | Type of company   |
|---|------|---|---|
| <b>Manufacturer and supplier of solar air heating collectors</b>            |      |   |   |
| Conserval Engineering Inc.  | ON   | <a href="https://www.solarwall.com/">https://www.solarwall.com/</a>             | Collector manufacturer and project developer  |
| Matrix Energy   | QC   | <a href="http://www.matrixairheating.com">www.matrixairheating.com</a>          | Collector Manufacturer and project developer  |
| Trigo Energies  | QC   | <a href="http://www.trigoenergies.com">www.trigoenergies.com</a>                | Project developer   |
| Aéronergie  | QC   | <a href="https://www.aernergie.com/">https://www.aernergie.com/</a>             | Collector Manufacturer and project developer  |
| <b>Manufacturer and supplier of flat plate collectors</b>                   |      |   |   |
| Thermo Dynamics   | NS   | <a href="http://www.thermo-dynamics.com/">http://www.thermo-dynamics.com/</a>   | Manufacturer of flat plate collectors   |
| Solcan Ltd.   | ON   | <a href="https://solcan.ca/services/">https://solcan.ca/services/</a>           | Manufacturer of flat plate collectors and reseller of unglazed swimming pool collectors |
| <b>Manufacturer and supplier of concentrating collectors</b>                |      |   |   |
| Rackam  | QC   | <a href="http://rackam.com/en/">http://rackam.com/en/</a>                       | Project developer and collector manufacturer  |
| SolarSteam  | AB   | <a href="https://solarsteam.ca/">https://solarsteam.ca/</a>                     | Project developer and collector manufacturer  |
| Phoenix Solar Thermal   | ON   | <a href="https://phoenixsolarthermal.com/">https://phoenixsolarthermal.com/</a> | Project developer and collector manufacturer  |
| Maxun Solar   | ON   | <a href="https://maxun.solar/">https://maxun.solar/</a>                         | Project developer and collector manufacturer  |
| <b>Manufacturer and distributor of unglazed collectors for pool heating</b> |      |   |   |
| Enerworks   | ON   | <a href="https://enerworks.com/">https://enerworks.com/</a>                     | Manufacturer of unglazed pool heating collectors (brand Enersol) and importer           |
| Techno-Solis Inc  | QC   | <a href="http://www.techno-solis.com/">http://www.techno-solis.com/</a>         | Distributor for solar pool heaters  |
| Sun Solar   | n/a  | <a href="http://sunsolar.com/">http://sunsolar.com/</a>                         | Distributor for solar pool heaters  |
| <b>Importer of PVT collectors</b>   |      |   |   |
| Riada   | BC   | <a href="https://riada.ca/">https://riada.ca/</a>                               | Importer of PVT and vacuum tube collectors  |
| Hydro Solar Innovative Energy   | QC   | <a href="https://hydrosolar.ca/">https://hydrosolar.ca/</a>                     | Importer/reseller of PVT and vacuum tube collectors                                     |

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| <b>Importer of flat plate and/or evacuated tube collectors</b> |     |   |   |
|--|-----|---|---|
| Aalborg CSP  | USA | <a href="https://www.aalborgcsp.de/">https://www.aalborgcsp.de/</a>       | Project developer of larger, commercial solar thermal plants  |
| Digital Solar Heat   | AB  | <a href="https://digitalsolarheat.com/">https://digitalsolarheat.com/</a> | Importer of vacuum tube collectors and developer for a new control unit for complex renewable heating systems |
| Northern Lights Solar Solutions / SolarTubs                    | MB  | <a href="https://www.solartubs.com/">https://www.solartubs.com/</a>       | Importer of flat plate and evacuated tube collectors  |
| Simple Solar Heating Ltd                                       | AB  | <a href="https://www.simplesolar.ca/">https://www.simplesolar.ca/</a>     | Importer of flat plate and evacuated tube collectors  |
| Lightfors Canada   | NB  | <a href="https://lightfors.ca/">https://lightfors.ca/</a>                 | Importer of evacuated tube collectors   |
| Viessmann Manufacturing Company Inc.                           | ON  | <a href="http://www.viessmann.ca">www.viessmann.ca</a>                    | Importer of flat plate collectors   |

**Overview of the 21 companies sorted by portfolio that were invited to take part in the survey in February 2024**

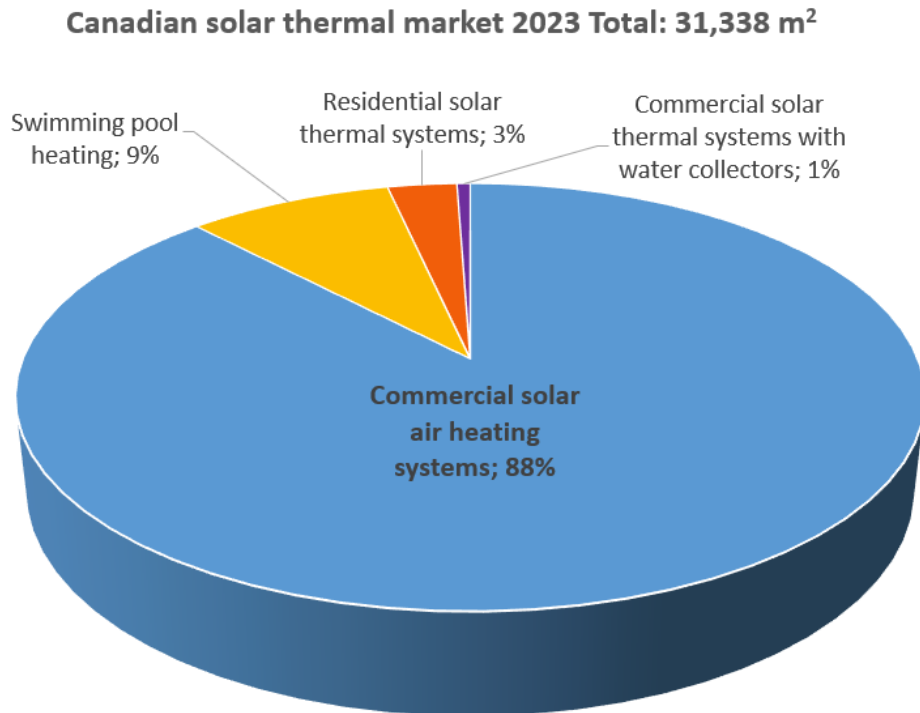
**Analysis of the response rate**

The survey was sent out to the companies first by email in individual emails and then follow-up by phone. This can be seen as a successful followup strategy because we have received feedback from 16 companies within the list of 21 companies. A response rate of 76 % is a satisfying result for this first survey carried out by solrico. Only five companies did not provide responses to the survey during the two month period.

However, the intensity of participation in the study varied greatly, as the following list shows:

- 9 companies filled in the full 4-page survey, seven of them with figures
- 3 companies filled in the short 2-page survey, two of them with figures
- 2 companies filled in the opinion poll survey
- 2 companies provided sales figures by email without using the form

## Part 2: Executive Summary



**Figure 1: Gross collector area sold in Canada in 2023 according to application [Total 31,338 m<sup>2</sup>]**

Solar air heating is the main application for the solar thermal industry in Canada. 88 % of the newly installed collector area in 2023 were glazed and unglazed air collectors. Their market volume grew by 35 % compared to 2022 because of support policies in the western Canadian province of Quebec.

The fact that residential solar water heaters are not explicitly mentioned as one of the eligible technologies within the national Greener Homes Grant Program makes it hard to sell them to homeowners. Its share of the overall market is correspondingly small (3 %). The solar thermal industry sees solar process heat, solar district heating and solar assisted heat pumps as the applications with the best growth potential in Canada. These are some of the findings of the most current survey about the Canadian Solar Thermal Market Development 2022 and 2023.

“The Canadian solar thermal industry has a broad portfolio. It offers solar heat solutions with various collector types to a wide range of customers. Most of the collectors are produced in Canada which means high local added value and makes the industry independent of international supply bottlenecks,” said Lucio Mesquita, pointing out some important results of the study. He is Senior Engineer of the Renewable Heat and Power Group as CanmetEnergy of Natural Resources Canada and commissioned the study.

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Across all collector types the participating companies reported sales of 31,339 m<sup>2</sup> of collector area in 2023, an increase of 27 % compared to the 24,592 m<sup>2</sup> of the year 2022. The strong growth was due to the air collectors. Sales figures rose here, particularly in Quebec. Two reasons were given for this in the survey: Increased subsidies by Quebec's gas and electricity utilities and more stringent rules on mandatory heat recovery in the building code.

Encouraging is also the fact that eight companies would support financially and organizationally the foundation of a Canadian Solar Heat Alliance or Association and two more companies answered "perhaps". Only one company ticked a "no" here.

### **Lack of interest in solar thermal by the government**

It seems important for the industry to join forces in order to gain a stronger voice in the political arena. The majority of solar thermal manufacturers and resellers are not satisfied with their business development. Only two of the twelve companies that made a statement here ticked 'satisfied'. The main reason for dissatisfaction is the lack of political support. "Solar water heaters should have benefited from being included in the Greener Homes Grant Program", claimed one survey participant.

Among the eligible retrofits are heat pumps and photovoltaics as well as insulation or new windows. Home owners can apply for interest-free loans up to CAD 40,000 and receive grants up to CAD 5,000 for heat pumps and PV systems since May 2021. The solar thermal industry notes a lack of interest by the government, caused by a negative perception of solar thermal. Parallel to the generous incentives for PV and heat pumps, some suppliers have withdrawn solar thermal energy from their programmes in the last two years.

The situation is different for manufacturers and suppliers of solar pool heating systems with unglazed collectors. They have always offered these systems without subsidies and demand is growing again, as one satisfied participant reported during the survey.

Effective communication will be key factor for unlocking the sector's growth potential. Despite the unfavourable political situation at present, numerous solar thermal companies expect demand to grow. Six companies anticipate 'moderate growth', one even expects 'strong growth' (see figure below). Various reasons are given here. "Carbon taxes stimulate demand in the smaller commercial installations", is one of them. "Moving away from natural gas heating will increase interest in solar thermal", is another one. But also internal factors such as "strong promotion" or "effective communication" are mentioned as key factors for unlocking the solar thermal sector's growth potential.

### Part 3: Analysis of the results

This chapter includes selected results from the survey. The questions from the questionnaire are marked in purple. The 4-page questionnaire is included in the appendix (see page 18).

#### Were you satisfied with your solar thermal sales in 2023?

Twelve companies answered this question, ten companies with “no” and only two with “yes”. The two companies answering “yes” come from the solar air heating and solar pool heating business respectively and the two are experiencing growing demand.

On the other hand the companies that ticked “not satisfied” name the lack of financial support for solar thermal, the high support for PV and the high costs for solar thermal as the main reasons. Selected reasons for “not satisfied” are listed in the following:

- Sales have not recovered from COVID shutdown. Governments are ignoring solar thermal in favour of heat pumps as climate change solution.
- Fallout of pandemic: significant increase in cost of materials and labour impacted project ROI
- Low interest in solar thermal due to extremely low price of solar PV and relatively high government rebates for solar PV.
- Solar thermal in Canada is not as cost saving as in warmer climates.
- The solar water heater systems should have benefited from being included in the Greener Home Grant Program.
- Lack of Government incentives for customers and/ or incentives hidden from customers, or drowned by PV plus Heat pump incentives.
- Most customers struggle with the overall cost of the solar systems. Lots of project quotes but few final sales.

#### How many FTE employees for solar thermal activities were working at your company at the end of 2023?

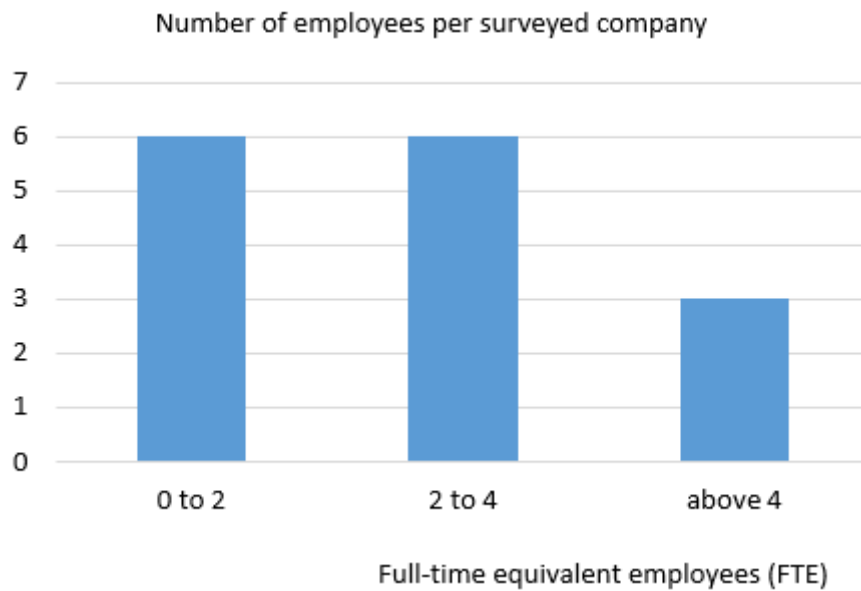
15 companies answered this question and they engage in total 48 employees, in average: 3.2 per company. This figure represents only a certain section of the value chain related to manufacturing, distribution and planning (direct jobs). If you relate the number of jobs to the installed area in Canada in 2023, you get a factor of 653 m<sup>2</sup> deployed collector area per FTE.

In many cases the installer business and the after sales business is not included in the number of employees that were reported by the companies (indirect jobs).



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**Figure 2: Number of companies that reported a certain amount of FTE employees engaged in solar thermal activities in their companies (direct jobs)**

To estimate the total number of direct and indirect jobs in the Canadian solar thermal industry, the methodology of the international study Solar Heat Worldwide (SHWW) was used (see following table).

| Country with...   | Factor: Newly installed collector area per full-time job |
|---|--|
| ... high labour cost, advanced automated collector and storage tank production, and mainly pumped systems                         | 133 m <sup>2</sup> /job                                  |
| ... low labour cost, advanced automated production of evacuated tube collectors and heat storage, and mainly thermosiphon systems | 87 m <sup>2</sup> /job                                   |
| ... mostly manually produced flat plate collectors and low labour costs   | 87 m <sup>2</sup> /job                                   |
| ... unglazed swimming pool absorbers and air collectors   | 200 m <sup>2</sup> /job                                  |

**Job calculation factors in different countries used by Solar Heat Worldwide on a global level** Source: [news article on solarthermalworld.org](https://www.solarthermalworld.org/news-article-on-solarthermalworld.org)

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If you now apply the factors to the collector surface manufactured in Canada, you get 163 jobs – which is significantly higher than the number of reported jobs from the surveyed companies.

|   | <b>Sold collector area in 2023</b> | <b>Job factor</b>       | <b>Total jobs</b> |
|---|------------------------------------|-------------------------|-------------------|
| Glazed Liquid (flat plate, evacuated tube und PVT collectors) | 1,327                              | 200 m <sup>2</sup> /job | 7                 |
| Air (unglazed and glazed air collectors)                      | 27,532                             | 200 m <sup>2</sup> /job | 138               |
| Unglazed Liquid (swimming pool collectors)                    | 2,480                              | 133 m <sup>2</sup> /job | 19                |
| <b>Total</b>  |                                    |                         | <b>163</b>        |

**Calculation of total direct and indirect FTE jobs in the Canadian solar thermal sector using the job factors of Solar Heat Worldwide**

**How high were your revenues associated with sales of solar thermal products and services in 2023?**

11 companies reported a turnover in CAD for the year 2023 related to solar thermal products and services. The turnover of the 11 companies added up to CAD 8.059 million related to sales on the national market plus export business. This is in average a turnover of around CAD 806,000 per company. There are three technology development companies among the firms that reported turnover and they report a specifically lower turnover in 2023, as they have not started selling the newly developed products yet and pay their bills by equity or investor funding.

Six of the companies that reported turnover also export solar thermal products and the total turnover of the exported solar thermal products is CAD 1.26 million. That means that 16 % of the turnover of these companies is made by exports.

**Gross collector area sold in Canada in 2022 and 2023**

Across all collector types a total of 24,592 m<sup>2</sup> collector area was installed in Canada in 2022 and 31,339 m<sup>2</sup> in 2023. A large majority of the collectors are produced in Canada. The market grew by an encouraging 27% in 2023, primarily due to increased demand for air collectors.

Only a rather small percentage of the sales were imported (5 % in 2022 and 4 % in 2023). This self-sufficiency of the industry with locally produced collectors is an important strength of the industry.

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|      | <b>Domestically produced collector area</b> | <b>Imported collector area</b> | <b>Totally installed collector area</b> | <b>Share of local production</b> |
|------|---|--------------------------------|---|----------------------------------|
| 2022 | 23,391                                      | 1,201                          | 24,592                                  | 95 %                             |
| 2023 | 30,196                                      | 1,142                          | 31,339                                  | 96 %                             |

**Share of domestically produced and imported collector area in 2022 and 2023**

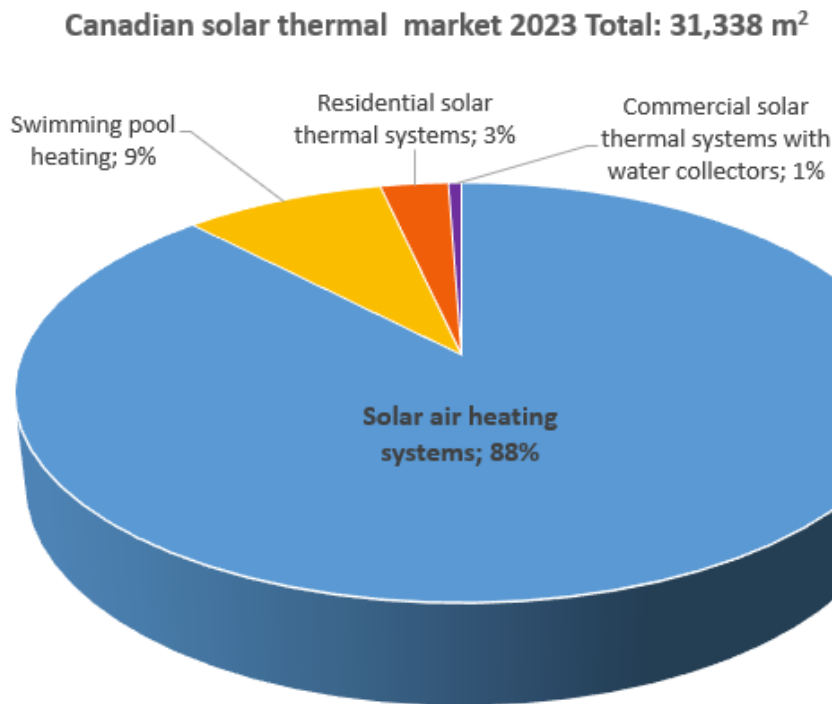
|  | <b>Sold area according to collector type [m<sup>2</sup>] in 2022</b> | <b>Sold area according to collector type [m<sup>2</sup>] in 2023</b> | <b>Growth 2022/2023</b> |
|--|--|--|-------------------------|
| Total sales in unglazed air collectors     | 19,991   | 25,939   | 30%                     |
| Total sales in glazed air collectors       | 345  | 1,593  | 362%                    |
| Total sales of flat plate collectors       | 1,187  | 782  | -34%                    |
| Total sales of unglazed water collectors   | 2,408  | 2,480  | 3%                      |
| Total sales of evacuated tube collectors   | 530  | 515  | -3%                     |
| Total sales of parabolic trough collectors | 82   |  |                         |
| Total sales of PVT collectors              | 49   | 29   | -41%                    |
| <b>Total</b>                               | <b>24,592</b>  | <b>31,338</b>  | <b>27 %</b>             |

**Gross collector area sold in Canada in 2022 and 2023 according to collector type.**

Further remark: Two companies only reported figures for the fiscal year 2022 / 2023 and they said the market volume remained more or less stable in both years, so the same sales figures were used for 2023.

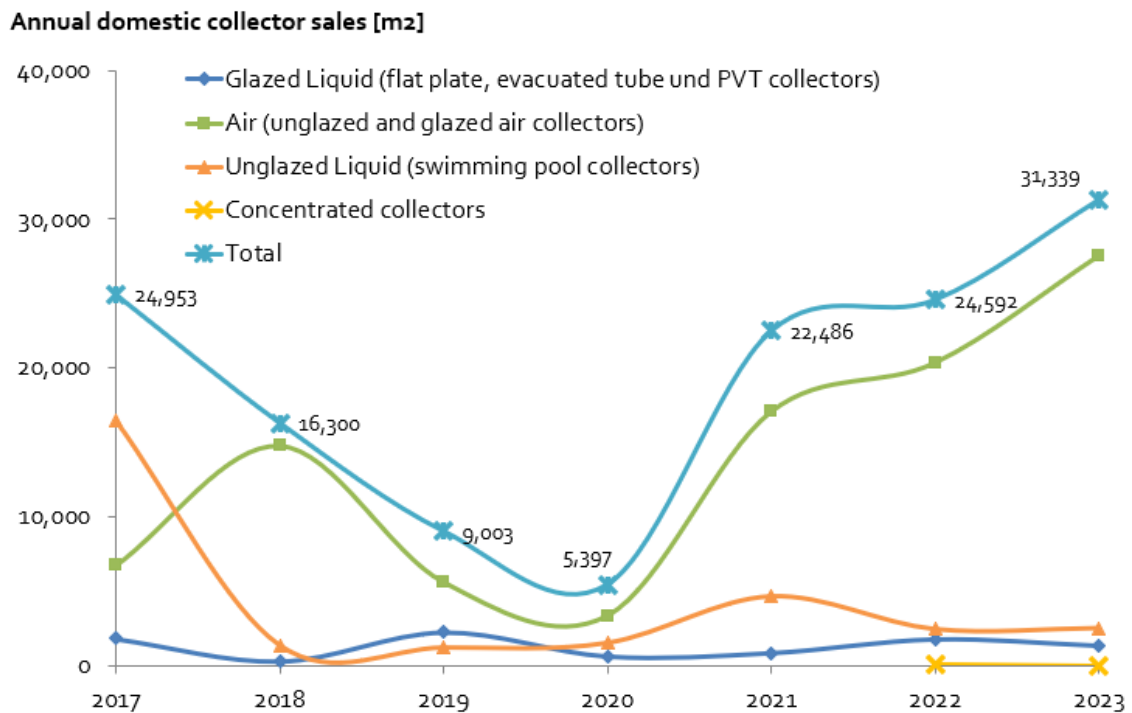
| <b>Application</b>             | <b>2022</b>   | <b>2023</b>   | <b>Growth/Decline 2022/2023</b> |
|--------------------------------|---------------|---------------|---------------------------------|
| Swimming pool                  | 2,608         | 2,712         | 4%                              |
| Domestic hot water             | 409           | 355           | -13%                            |
| Commercial domestic hot water  | 855           | 483           | -44%                            |
| Solar combi systems            | 63            | 81            | 29%                             |
| Other commercial installations | 20,656        | 27,708        | 34%                             |
| <b>Total</b>                   | <b>24,592</b> | <b>31,338</b> | <b>27%</b>                      |

**Gross collector area sold in Canada in 2022 and 2023 according to application.** The swimming pool market is probably underestimated because major distributors did not deliver figures in the surveys of the previous years.



**Figure 3: Gross collector area sold in Canada in 2023 according to application [Total 31,338 m<sup>2</sup>]**

Figure 3 shows that the absolute dominating application is the commercial solar air heating market (88 % of the newly installed collector area in 2024). Swimming pool heating accounts for 9 %. Residential solar thermal systems only play a minimal role. The swimming pool market is probably underestimated because major distributors did not deliver figures in this year's survey.



**Figure 4: Domestic sales of different collector types between 2017 and 2023.**

Figure 4 shows the market development of different collector types between 2017 and 2023. The pandemic certainly played a large role in the temporary decline in sales. One has to consider that some of the distributors of unglazed liquid swimming pool collectors did not take part in the survey in the years between 2018 and 2023, therefore this segment is not correctly depicted in the chart.

**List two key factors that have positively impacted your solar thermal business in 2023**

Seven companies have given factors that positively impacted their sales. What is striking is that four companies indicated internal factors that have to do with their portfolio and sales activities. Two companies cited new or improved funding conditions as a driver.

- Long-term in business with a list of repeat associates and customers.
- Subsidy increases for solar air preheating programs by Quebec’s gas and electric utilities. More stringent rules on mandatory heat recovery in the building code.
- Introduction of PVT plus heat pumps and supporting gel battery arrays to extend heat pump daytime operation
- To be the only solar company offering complete all-in-one packages
- Clean Energy Improvement Programme for solar thermal introduced in Alberta. Promotion of all-electric homes means gas heating no longer available which improves solar thermal economics.

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- Green Energy Initiatives and Rising Energy Prices
- Commercial projects where there is a mandate to decarbonize, i.e. carbon tax and projects using solar thermal to recharge geo fields. This is the new opportunity

**List two key factors that have negatively impacted your solar thermal business in 2023**

Eight companies have listed factors that have negatively impacted their business. The most cited argument here is the lack of support for solar thermal energy compared to the good support for heat pumps and PV.

- No government incentives or promotion for solar thermal, low natural gas prices and high installation costs
- Pandemic induced slow-down in business and increase in labour and material costs.
- Difficulty to hire workforce (severe manpower shortage), absence of technology recognition, and non-financial support in many export markets (incl. Germany)
- Lack of interest by governments for actual solar thermal solutions and lack of clarity of potential clients for understanding that solar thermal with interseasonal storage can actually heat homes and businesses in Canada.
- No incentives in the Canadian markets
- Generous solar PV incentive from Greener Homes Program and negative perception of solar thermal
- Elimination of government rebates for solar thermal and no promotion of solar thermal, but at the same time excess promotion of heat pumps
- Lack of rebates for solar installations and solar thermal is too costly for most home owners

**How do you believe the Canadian solar thermal market will develop in the next 5 years?**

13 companies answered this question: six ticked “moderate growth” and six ticked “stagnant” and one company expects strong growth (see figure 5). Several companies assume that there will still be no funding for the residential market segment and therefore no growth can be expected here.

A turnaround to a growing solar thermal market could be triggered by rising energy costs and internal factors such as strong promotion of the product or technological advancements.

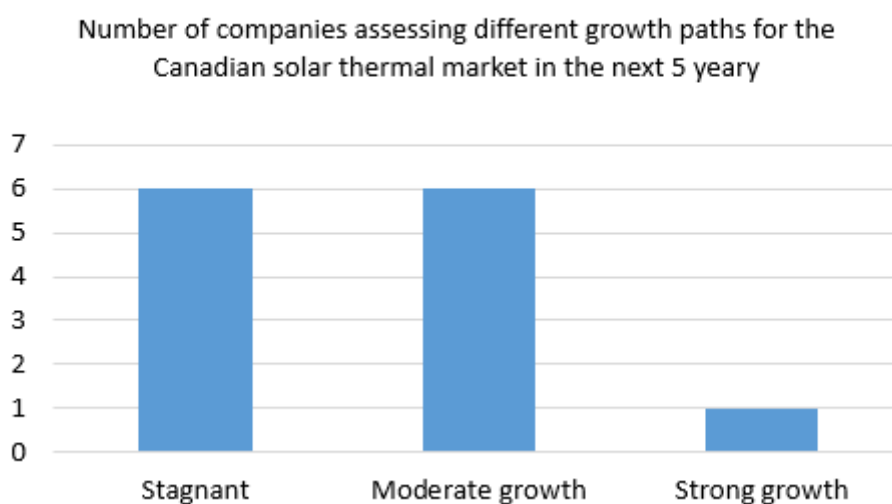
**Quoted reasons for moderate/strong growth:**

- Moving away from natural gas heating will increase interest in solar thermal.
- Rising energy cost, higher energy grid risk.

- While facing stiff competition from emerging renewable technologies (heat pumps and hydrogen) and combating outdated perceptions (associated with outdated solar thermal technologies), I believe the Canadian solar thermal market has the potential for moderate growth in the next 5 years. Strategic positioning, technological advancements, and effective communication will be key factors in navigating these challenges and unlocking the sector's growth potential.
- Carbon tax is the driver for this growth. Especially with municipalities and smaller commercial installations.
- Strong promotion activities for the own product

**Reasons for stagnant market development:**

- Government prefers 100% heat pumps and not a hybrid of solar with gas or heat pumps & their policies are based on switching to all electric
- If nothing changes policy wise, why would market volumes change?
- The cost of PV solar is so much less than solar thermal
- While the PV and heat pump industries have benefited from government subsidy programs, solar thermal has been ignored yet again.
- No horizon implementation of acceptability or customer understanding and drive. Without government showing the way there will continue to be full-on apathy, even though it does work.



**Figure 5: Number of companies assessing different growth paths for the Canadian solar thermal market in the next 5 years**

**In the next five years, which application do you believe has the best growth potential in Canada?**

11 companies answered the question which application do you believe has the best growth potential in Canada. The applications which were ticked the most are solar assisted heat pumps, solar district heating and industrial solar heat solutions - each three times.

The problem with this multiple choice question has been that the companies surveyed offer a wide range of solar thermal solutions for different customer groups and therefore have a tendency to view their customer group as the one with the best growth potential. So in general there are too few answers with too many options to choose from, to identify a meaningful trend.

**Would you support association activities?**

11 companies have answered this question and a clear majority would support financially and organizationally the foundation of a Canadian Solar Heat Alliance or Association - a really encouraging signal to the industry.

| <b>Answers</b>   | <b>Yes</b>      | <b>Perhaps</b> | <b>No</b>     |
|--|-----------------|----------------|---------------|
| Would you support (financially and organisationally) the foundation of a <u>Canadian</u> Solar Heat Alliance or Association?       | Eight companies | Two companies  | One company   |
| Would you support (financially and organisationally) the foundation of a <u>North American</u> Solar Heat Alliance or Association? | Eight companies | One company    | Two companies |

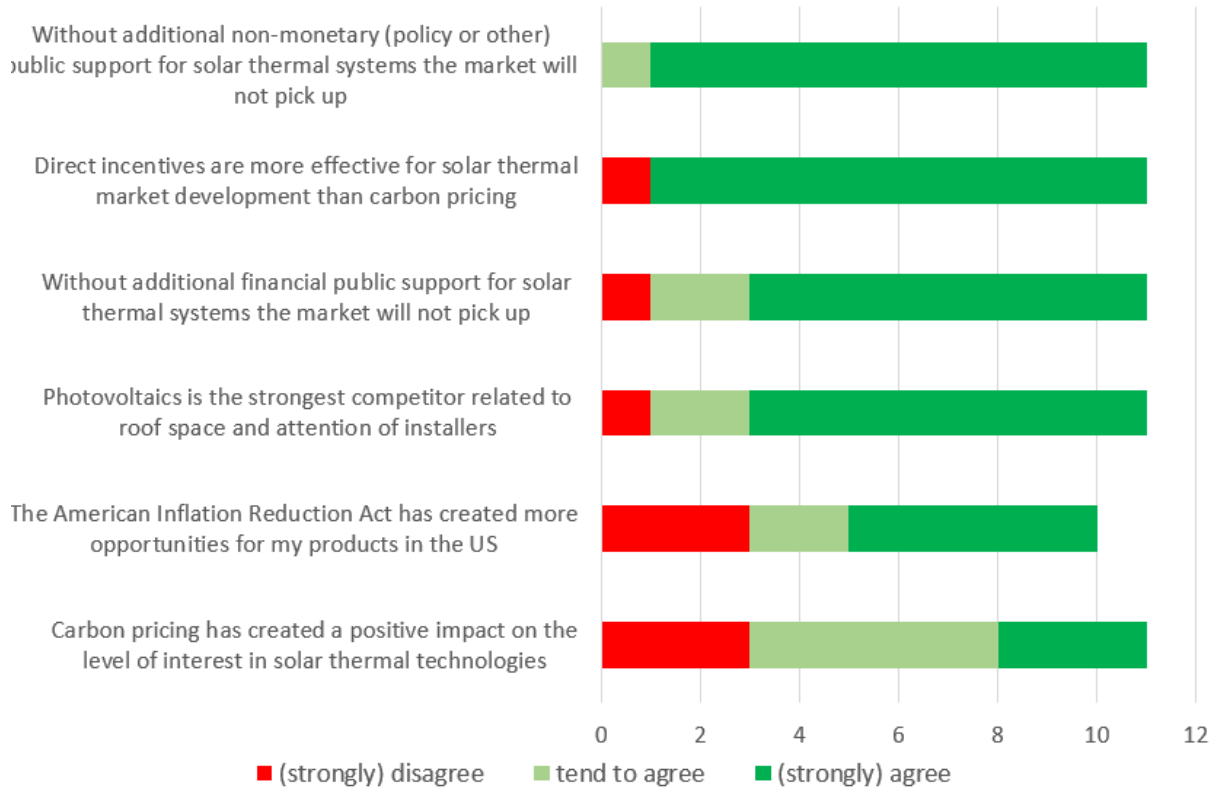
**Do you agree or disagree with the following statements regarding trends in the Canadian solar thermal market?**

This survey was also used to ask companies from the solar thermal sector to assess certain trends. 12 companies completed this part of the questionnaire. The answers were summarised as “strongly agree” plus “agree” and also the answers “strongly disagree” and “disagree” were added up, so that a three-way split of the answers could be made for each question. Figure 6 confirms that the lack of energy policy and direct incentives for solar thermal keeps demand low. 10 out of 11 companies find direct subsidies better than carbon pricing to stimulate the market (first question from above).



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Do you agree or disagree with the following statements regarding trends in the Canadian solar thermal market?



**Figure 6: Number of companies that agreed or disagreed with the given statements**

## Part 4: Annex

4-page version of the questionnaire

### Market Assessment of Canadian Solar Thermal Market 2022 and 2023

You are being invited to participate in a study of the Canadian solar thermal industry commissioned by Natural Resources Canada (NRCan) and undertaken by solrico, a German market research agency dedicated to the solar heating sector. This questionnaire is being sent to more than 20 collector manufacturers, project developers, importers, resellers, and installers of solar thermal systems in Canada to obtain comprehensive and reliable information on market size and industry trends.

#### Term of use of confidential information

The only person from solrico that is involved in the data gathering is the director Bärbel Epp. She will keep the provided data strictly confidential and will not share it with any third party. There will be no publication of specific sales or company data. The data will be shared with NRCan only in an aggregated form, meaning that the data provided will be pooled with all respondents such that the risk of personal identification is nearly eliminated. If there are too few respondents for any question, and there is a reasonable chance that data could be used to identify a respondent, we will not publish that data.

#### 1. General Company Data

|  |  |          |  |
|--|--|----------|--|
| Company name   |  | Web page |  |
| Full name of the person completing the questionnaire |  | Position |  |
| Your mobile number for enquiries                     |  |          |  |

|  |  |
|--|--|
| Which other companies should participate in this survey so that complete data about the Canadian solar thermal energy market can be collected? |  |
|--|--|

|  |  |
|--|--|
| What is the core business of your company? Please specify: |  |
|--|--|

|   |     |  |    |  |
|---|-----|--|----|--|
| Were you satisfied with your solar thermal sales in 2023?     | Yes |  | No |  |
| Please give reasons for your satisfaction or dissatisfaction. |     |  |    |  |

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**Report about the Canadian Solar Thermal Market Survey (2024)**

|  |  |
|--|--|
| How many full-time equivalent (FTE, equal to 40 hours a week/52 weeks a year) employees for <b>solar thermal activities</b> were working at your company at the end of |  |
|--|--|

|   |     |  |    |  |
|---|-----|--|----|--|
| Do you purchase all or a certain share of your sold collectors from a Canadian company? | Yes |  | No |  |
|---|-----|--|----|--|

|   |  |       |
|---|--|-------|
| How high were your revenues associated with sales of solar thermal products and services in 2023? |  | CAD\$ |
| Percent of revenues from domestic sales of solar thermal products and services                    |  | %     |
| Percent of revenues from export sales of solar thermal products and services                      |  | %     |

## 2 Relevant Collector Sales Data

Please report total gross collector area sold in Canada and exported by type of collector.

| Type of Collector                      | Collectors sold in Canada in 2022 (m <sup>2</sup> ) |                                   | Collectors sold in Canada in 2023 (m <sup>2</sup> ) |                                   |
|--|---|-----------------------------------|---|-----------------------------------|
|  | Manufactured by your company                        | Imported directly by your company | Manufactured by your company                        | Imported directly by your company |
| Liquid-based flat plate collectors     |   |                                   |   |                                   |
| Liquid-based evacuated tube collectors |   |                                   |   |                                   |
| Liquid-based unglazed collectors       |   |                                   |   |                                   |
| Glazed air collectors                  |   |                                   |   |                                   |
| Unglazed air collectors                |   |                                   |   |                                   |
| PV-Thermal collectors                  |   |                                   |   |                                   |
| Concentrating collectors               |   |                                   |   |                                   |

| Collector Type                         | Exported in 2022 [m <sup>2</sup> ] | Exported in 2023 [m <sup>3</sup> ] |
|--|------------------------------------|------------------------------------|
| Liquid-based flat plate collectors     |                                    |                                    |
| Liquid-based evacuated tube collectors |                                    |                                    |
| Liquid-based unglazed collectors       |                                    |                                    |
| Glazed air collectors                  |                                    |                                    |

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|                          |  |  |
|--------------------------|--|--|
| Unglazed air collectors  |  |  |
| PV-Thermal collectors    |  |  |
| Concentrating collectors |  |  |

Please report domestic sales by gross area according to the type of application. Only report systems sold directly to final customers (not to distributors or dealers).

| <b>Type of Application</b>   | <b>Collector area sold in Canada 2022 (m<sup>2</sup>)</b> | <b>Collector area sold in Canada 2023 (m<sup>2</sup>)</b> |
|--|---|---|
| Swimming pool heating  |   |   |
| Domestic hot water systems for single family houses  |   |   |
| Large domestic hot water systems (multi-family houses, tourism and public sector)                |   |   |
| Solar combi-systems (domestic hot water plus space heating in the residential sector)            |   |   |
| Other commercial installations (Solar district heating, solar process heating and solar cooling) |   |   |

### 3 General Market Trends, Barriers, and Opportunities

|   |  |
|---|--|
| List two key factors that have <u>positively</u> impacted your solar thermal business in 2023 |  |
| List two key factors that have <u>negatively</u> impacted your solar thermal business in 2023 |  |

What level of support (CAD/m<sup>2</sup>) do you believe would be required to effectively support solar thermal systems?

(If you do not have information for one particular sector, please leave it blank.)

| Solar air heating | Residential solar hot water | Commercial solar hot water | Swimming pool systems | Solar process heat with stationary collectors | Solar process heat with concentrating collectors |
|-------------------|-----------------------------|----------------------------|-----------------------|---|--|
|                   |                             |                            |                       |   |  |

How do you believe the Canadian solar thermal market will develop in the next 5 years?

| Strong growth                              | Moderate growth | Stagnant | Moderate decline | Strong decline |
|--|-----------------|----------|------------------|----------------|
|  |                 |          |                  |                |
| <b>Please give reasons for your choice</b> |                 |          |                  |                |

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In the next five years, which application do you believe has the best growth potential in Canada?

Please select only two options!

| Solar water heating solutions       | Solar swimming pool heating | Solar air heating | Solar industrial heat solutions | Solar for community/district heating | PV for heating applications | PV-Thermal | Solar thermal assisted heat pumps | Others |
|-------------------------------------|-----------------------------|-------------------|---------------------------------|--------------------------------------|-----------------------------|------------|-----------------------------------|--------|
|                                     |                             |                   |                                 |                                      |                             |            |                                   |        |
| Please give reasons for your choice |                             |                   |                                 |                                      |                             |            |                                   |        |

|  |     |  |    |  |
|--|-----|--|----|--|
| Would you support (financially and organisationally) the foundation of a <u>Canadian</u> Solar Heat Alliance or Association?       | Yes |  | No |  |
| Would you support (financially and organisationally) the foundation of a <u>North American</u> Solar Heat Alliance or Association? | Yes |  | No |  |

Do you agree or disagree with the following statements regarding trends in the Canadian solar thermal market?

|   | Strongly Agree | Agree | Tend to agree | Disagree | Strongly disagree |
|---|----------------|-------|---------------|----------|-------------------|
| The proposed Clean Technology Manufacturing ITC Tax credit will significantly increase demand for solar thermal solutions in the next few years |                |       |               |          |                   |
| Carbon pricing has created a positive impact on the level of interest in solar thermal technologies   |                |       |               |          |                   |
| Photovoltaics is the strongest competitor related to roof space and attention of installers   |                |       |               |          |                   |
| Without additional <u>financial</u> public support for solar thermal systems the market will not pick up  |                |       |               |          |                   |
| Without additional <u>non-monetary (policy or other)</u> public support for solar thermal systems the market will not pick up                   |                |       |               |          |                   |
| Direct incentives are more effective for solar thermal market development than carbon pricing   |                |       |               |          |                   |
| The American Inflation Reduction Act has created more opportunities for my products in the US   |                |       |               |          |                   |

Thank you very much for your support!