harmonic analytics

NZPPI: Energy, Plastic and Water Use Survey

Prepared for NZPPI

11/04/2024

Table of Contents

Executive summary

NZPPI, as part of a wider trend towards increasing business's sustainability, contracted Harmonic Analytics to perform a survey on its members' Energy, Water and Plastics use. This survey will inform NZPPI's strategy with respect to sustainability going forward.

Methodology

Once a draft survey was written it was then tested on a small group of NZPPI members and several Harmonic Analytics employees to refine the survey design. After implementing their feedback, the survey was sent to the full list of NZPPI's members. During the survey period follow-up emails through Survey Monkey were sent to recipients and follow-up phone calls were made to non-responsive survey recipients. The results from the survey were downloaded from survey monkey and processed. These processed results were then used to create figures showing the distribution of respondents' responses to survey questions.

Findings

With respect to the three components of the survey, Energy, Water and Plastic use the primary finding are:

- Many of NZPPI's members wish to transition to solar energy, but barriers such as cost and uncertainty around the technology keep them from doing so.
- The primary use of non-renewable energy is in diesel vehicles and supporting transition to electric vehicles could significantly reduce reliability on non-renewable energy for the industry at large.
- Recipients use a variety of water sources, but could be taking more proactive steps to manage their water, especially with prevalent concerns around water restrictions.
- Plastic management has some encouraging trends with respect to plastic alternatives and recycling practices, however waste plastic still tends to end up in landfills at the end of its life.

Recommendations

Addressing the above findings would be beneficial for NZPPI's members and appear to be excellent strategies for enhancing the industry's sustainability as a whole. Members who have indicated their interest in sustainability present the best group to work with moving forward in the immediate future.

Introduction

In March 2024 NZ Plant Producers Incorporated (NZPPI) contracted Harmonic Analytics to conduct a survey about their members' Energy, Plastic and Water use. The Energy, Water and Plastic survey was co-funded through EECA as part of their push to transition New Zealand businesses away from non-renewable to renewable energy sources. NZPPI is the industry body for plant producers in New Zealand and other related industry partners and their goal is to advocate for these businesses to support the industry as a whole. Their members are primarily composed of plant nurseries who grow seedlings for a variety of applications. Their other members are plant retailers (i.e. garden centres) and businesses that also rely on plant nurseries. The goal of this survey for NZPPI was to understand what types of risk their member businesses are exposed to with respect to the areas of energy, plastic and water use. Given their member base, energy, water and plastics are the primary resources for their businesses. NZPPI can then use this information to best understand how to support its members going forwards and reduce their risk with respect to these vital areas.

Methodology

To conduct this survey Harmonic Analytics worked with NZPPI to create a SurveyMonkey survey that best captured the information they were interested in with respect to their member's energy, water and plastic usage. The survey contained a mixture of:

- Single-answer multi-choice questions,
- Multiple-answer multi-choice questions,
- Ranked-response questions
- Open-ended responses.

This survey was then sent to a subset of NZPPI members and some Harmonic Analytics employees for testing before the survey was sent to the remaining NZPPI members for a collection period of two weeks, followed by an extension of one week. During this period reminder emails and follow up phone calls were used to increase the response rate of the survey, where the target response rate was 50%.

The responses from this survey were then processed, cleaned and formatted into a consistent representation in order to create figures using the survey data. These figures are a mixture of bar charts describing categorical responses to multi-choice questions, Sankey diagrams describing associations between responses and word clouds to visualise open-ended responses.

Survey Results

A total of 204 invitations were sent to NZPPI's members to complete the Energy, Plastic and Water Survey. From this, 73 responses were received, with 58 being complete responses and 15 partial responses. 8 additional responses were recorded over the phone during follow up calls. This resulted in 81 total responses, 64 complete and 15 partial. This gave a final response rate of 39.7%.

Respondent Type

As a baseline it was necessary to understand who the survey respondents were. The demographics of interest in this case were the type of business, which was either a plant nursery, retail outlet or other if the respondent didn't feel that they fell into either category. For the plant nurseries, it was also of interest to establish what type of plants they were primarily growing.

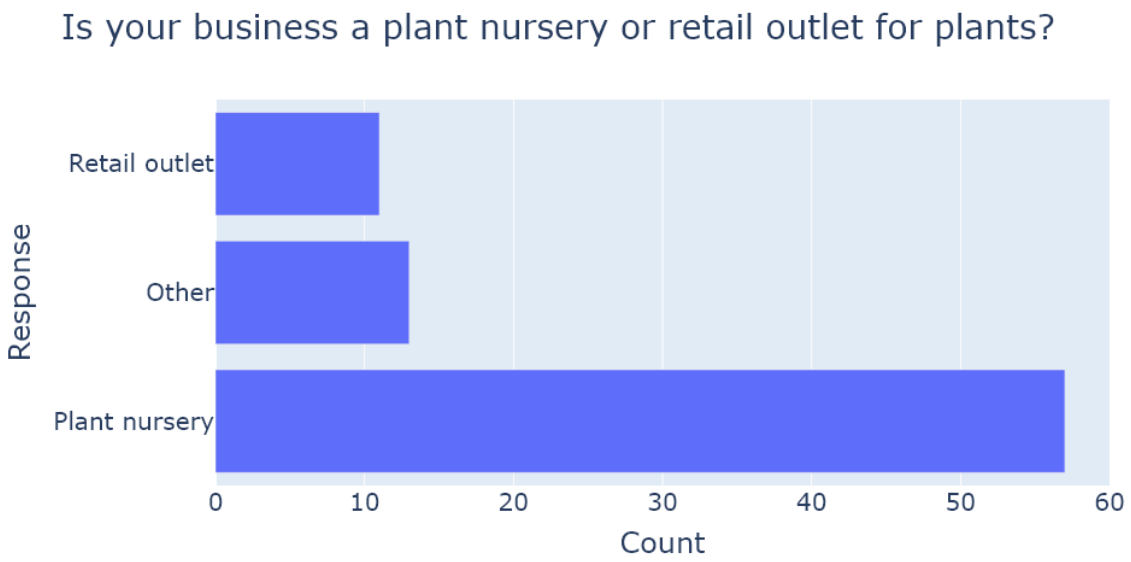

Figure 1

In this survey, most respondents were plant nurseries as shown in figure 1, with a smaller fraction being retail outlets. The other respondents mostly replied that they were both a nursery and retail outlet.

Figure 2

Among the plant nursery respondents they primarily grew plants for retail and revegetation.

Energy use

For the energy use section of the survey the primary goal was to understand what kinds of renewable and non-renewable energy NZPPI's members were using and what it was being used for. Additionally, an understanding of what member's intentions with respect to renewable energy transition and how to support this was sought. With a transition away from non-renewable energy being an essential part of creating a sustainable economy, it is critical to understand how close to this members actually are. Additionally, understanding how best to support members through this transition will enable NZPPI to operate much more effectively.

The figures 3 and 4 present data related to the respondents renewable and non-renewable energy use and sources. Each respondent was asked what their primary source for renewable and non-renewable energy was. Similarly, they were asked what the primary use of this energy source was. Both of these fields were used to create the two Sankey diagrams shown below.

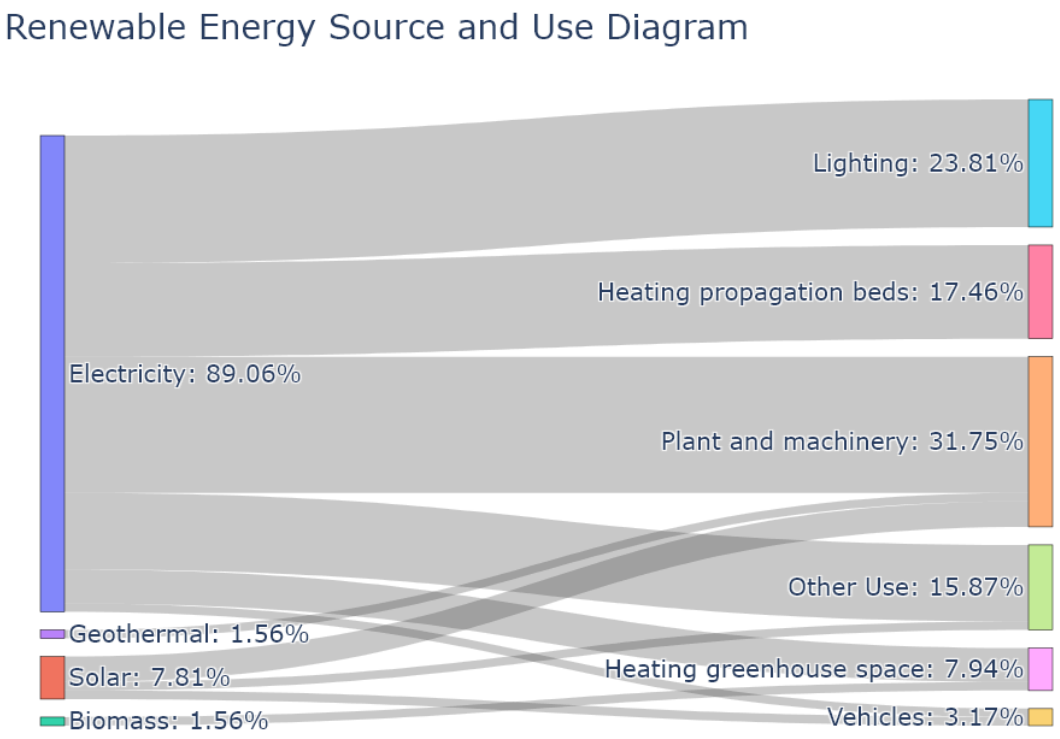

Figure 3

In figure 3 it is evident that the bulk of energy used is sourced from electricity, with all of lighting and propagation bed heating being powered by electricity. Solar has the next largest contribution, but at less than a tenth of the proportion of electricity. Solar is primarily used to power plant and machinery. The other uses primarily consisted of energy for office use i.e. heating, lighting and electronics.

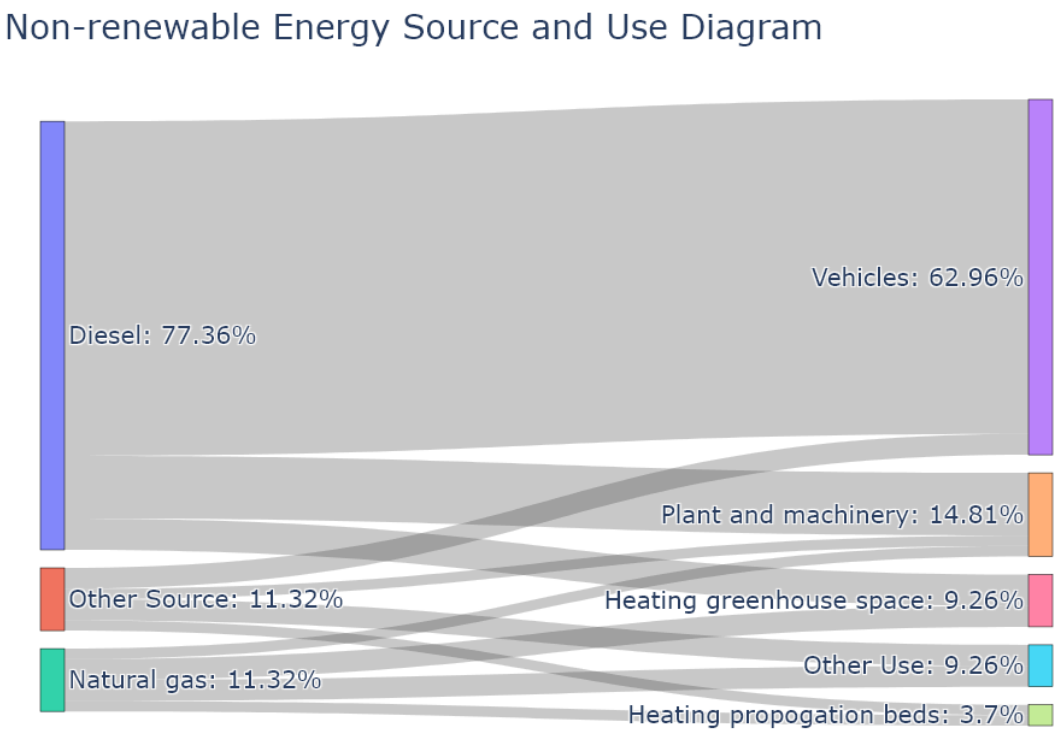

Figure 4

Diesel vehicles are the primary use of non-renewable energy and to a lesser extent diesel is used for plant and machinery and heating greenhouse spaces as demonstrated in figure 4. In contrast very few electric vehicles are being used by plant producer members, where vehicles powered by renewables represent 3% of the renewable energy use results .

Proportionately, renewables are used more for lighting, heating propagation and plant and machinery. Heating greenhouse spaces has a similar proportion between renewable and non-renewable usage.

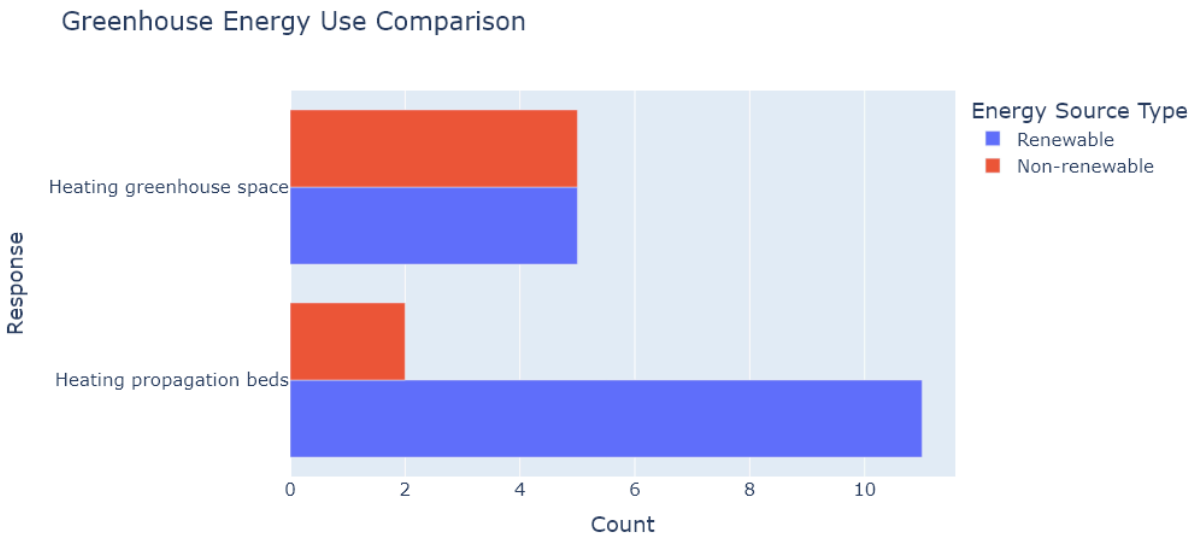

Figure 5

Figure 5 shows a comparison between renewable and non-renewable energy for greenhouse heating and propagation bed heating. Greenhouse heating is evenly split between renewable and non-renewable sources, whereas propagation bed heating primarily uses renewable energy (electricity).

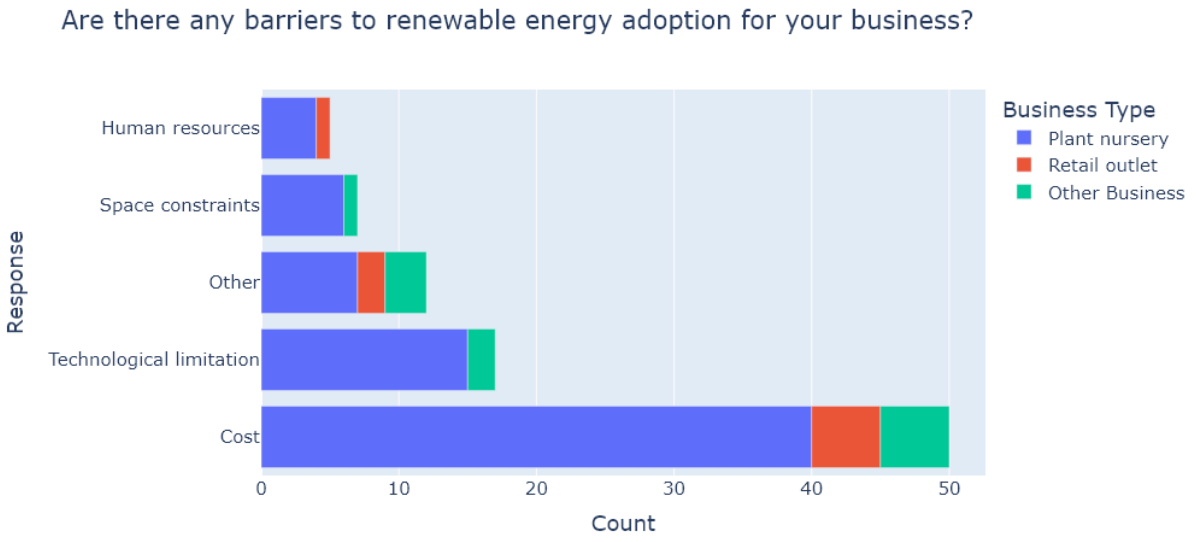

Figure 6

With respect to the data in figure 6, it is clear that cost is the primary barrier to adoption of renewable energy sources. Technological limitations are another barrier, which may be with respect to solar technology or electric vehicle technology. Other barriers related to the circumstances of the respondents property such as limited size or restrictions due to lease agreements were noted.

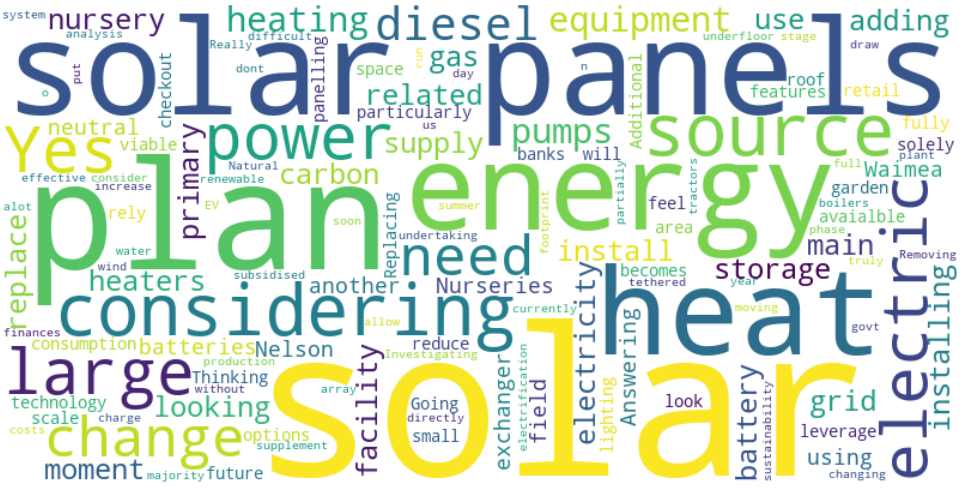

Figure 7: Word cloud of response to “Are you currently considering changing your energy sources?”

Figure 7 shows a word cloud of the responses when respondents were asked about their plans for the future about their energy sources. 52% of the responses expressed no current plan to change how they get their energy. However, 36% of these responses expressed an intention to transition to solar.

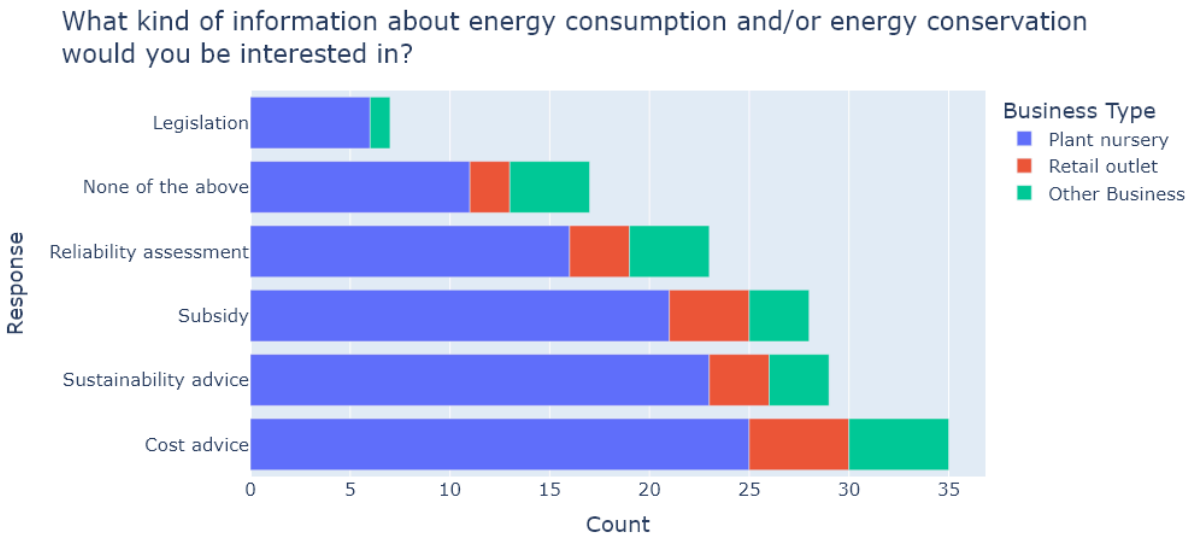

Figure 8

Based on the results in figure 8, members are primarily interested in how to manage the costs of energy consumption and conservation, through either advice or subsidies. Respondents also showed an interest in sustainability and reliability.

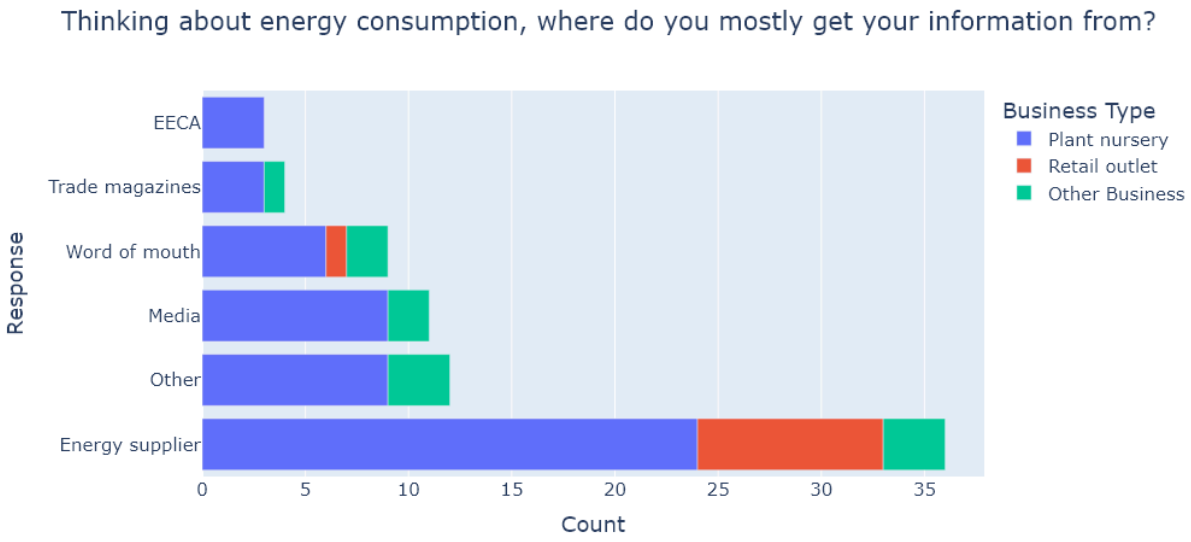

Figure 9

From figure 9 it appears that respondents primarily get information about energy consumption from their energy supplier. The information provided by energy suppliers may well be a breakdown of their energy consumption during their billing period. The other

responses in this case don't have much overlap between them, other than some mentioning the internet as an information source.

Water Use

Similar to the energy use section of the survey, questions on the water source and use habits were posed to respondents. Given the shifting expectations with respect to environmental conditions it is important to support member's access to water as a basic resource. These questions aimed to assess members' risk/vulnerability with respect to their water needs and how robust their water systems currently are. Diagrams similar to the energy source and use diagrams are presented here. In addition to the source and use, the water tracking habits of respondents is presented as well as responses on what they think their vulnerabilities with respect to water are.

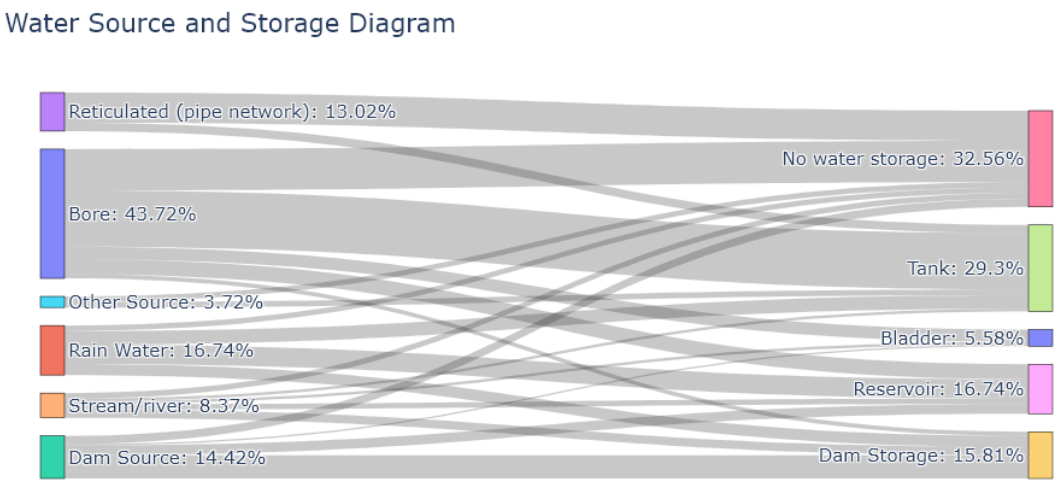

Figure 10

Figure 10 shows that respondents primarily rely on bore water with many also reliant on rain water, dam water and reticulated water. A third of the respondents have no water storage, with their water mostly being supplied by bore and reticulated water.

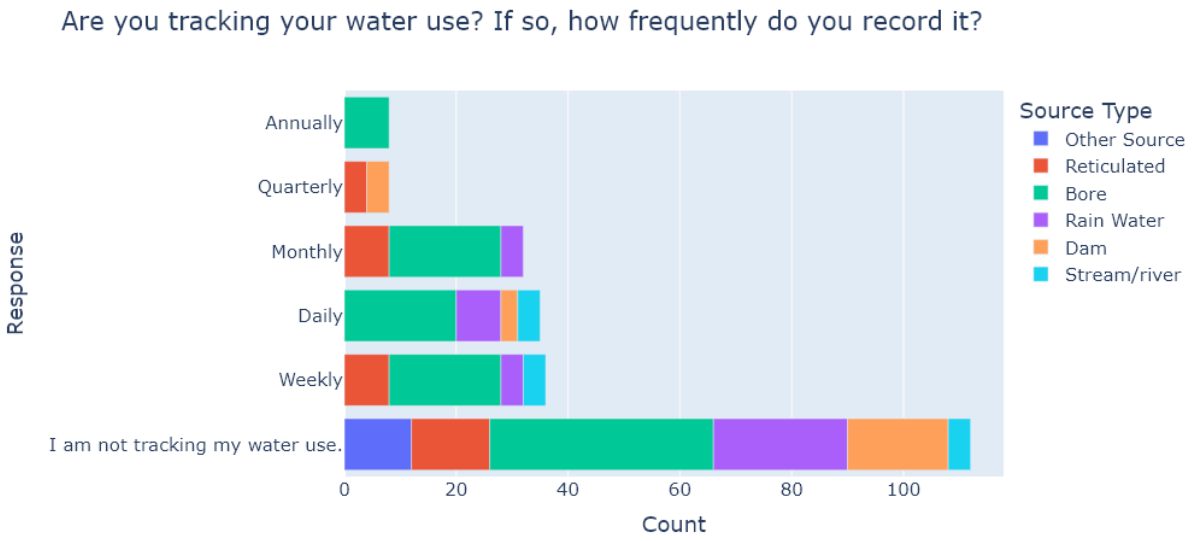

Figure 11

Figure 11 shows that bore water users are the most likely to track their water use. Overall 52% of respondents were tracking their water at some frequency.

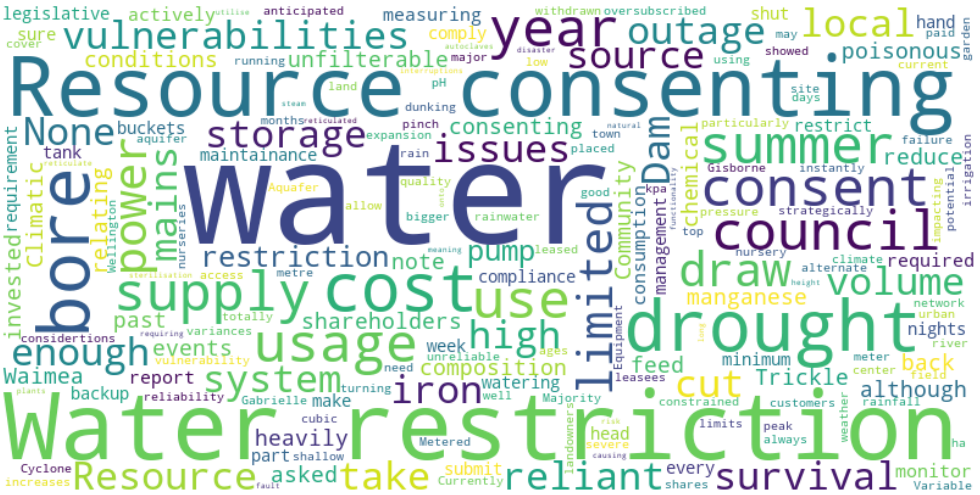

Figure 12: Word cloud of responses to “What are your vulnerabilities with respect to water?”

When it comes to vulnerabilities in their water resources, shown in figure 12, respondents are mostly concerned with resource consent (bores, streams etc) and water restrictions. Some respondents also noted the impacts of limited rainfall i.e. drought conditions, on water availability and council-imposed water restrictions.

Plastic Use

Members were asked about the use of plastics and plastic alternatives in their businesses, as well as plastic recycling and plastic disposal practices. The intention of these questions was to help understand where vulnerabilities might lay when Plastic Stewardship programmes come into force.

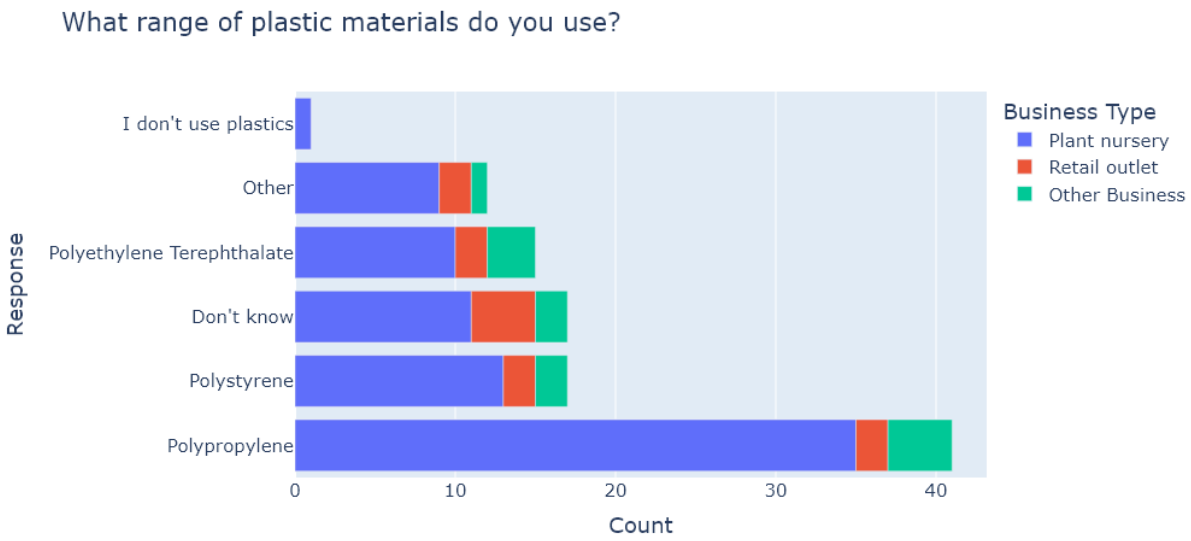

Figure 13

Polypropylene (PP5) was the most commonly used plastic among respondents, with a similar amount of respondents that either use PET or polystyrene, visible in figure 13. There is also a significant amount of respondents indicating that they don't know what type of plastic they are using. The other responses mostly describe the plastic use qualitatively rather than the material itself, which could be more akin to an "unknown" response for this question.

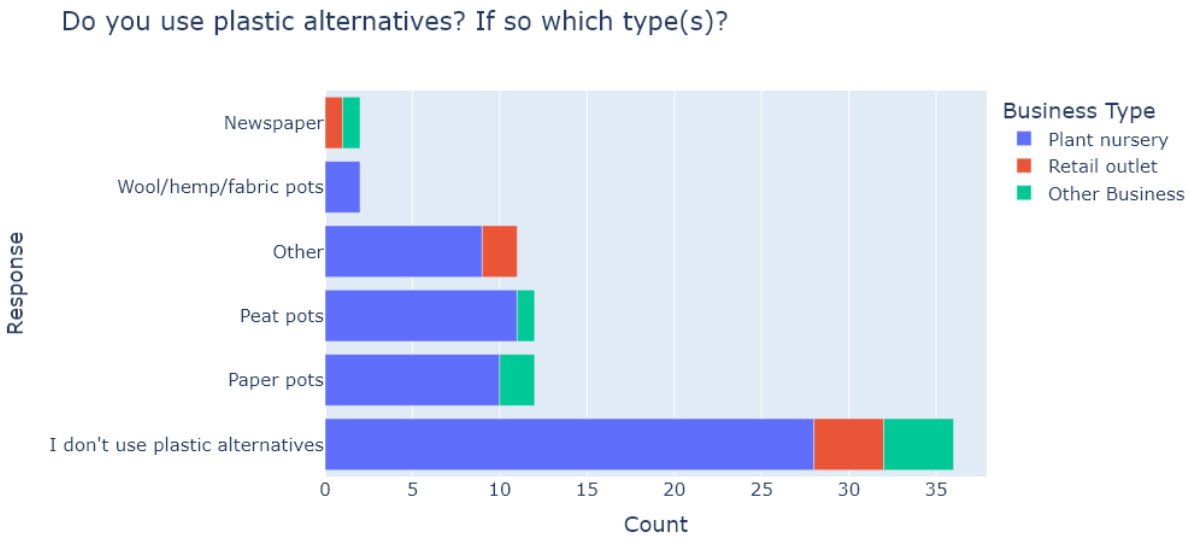

Figure 14

Figure 14 shows that most respondents do not use plastic alternatives, however paper and peat pots are the most popular options among those that use plastic alternatives. The other responses are quite diverse, some of which are specific brands/proprietary materials.

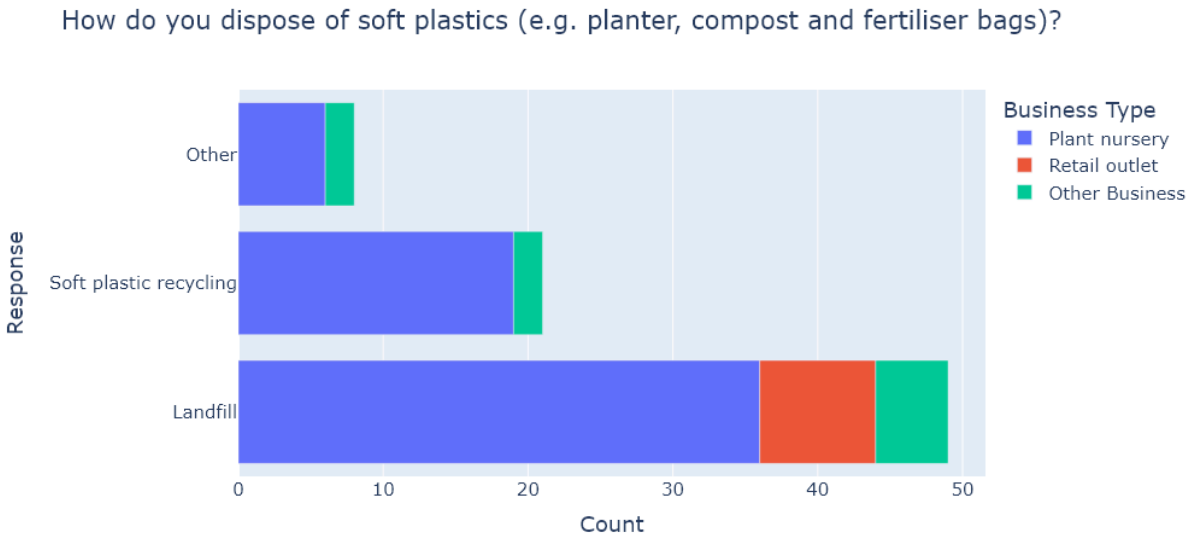

Figure 15

For soft plastic disposal responses in figure 15, respondents primarily use landfill as their means of disposal once soft plastics are no longer reusable. However, there are a fair number of respondents that use soft plastic recycling.

Figure 16: Word cloud of response to “What do you do with waste plastic?”

With respect to the responses on waste plastic in figure 16, respondents typically use their local landfill for disposal, however there are some who use a recycler or repurpose it themselves.

Conclusion

With respect to renewable energy use, many members signalled an interest in transitioning to solar energy. However, many are hesitant to commit to the transition due to cost and uncertainty around the technology. NZPPI could help members by providing information and access to expertise in this area.

Diesel fuel for powering vehicles, i.e. forklifts, utes and trucks was the dominant use of non-renewable energy among respondents. Some businesses have noted they would transition to electric vehicles where this was possible, however good EV alternatives to some transport/machinery is still some way off.

Respondents use a variety of water sources for their activities, with water bores being their primary source. About a third of the businesses did not have water storage in their business, however about half of the respondents are tracking their water use. In risks related to water, businesses were primarily concerned with issues related to water restrictions and resource consent.

Many respondents use polypropylene (PP5) as part of their plastic management, which is a 100% recyclable plastic. However the amount of non-recyclable plastics or lack of knowledge on plastic is also fairly prevalent. Some businesses are using plastic alternatives, but many do not. Many businesses attempt to reuse their plastics internally, but once they are of no use they tend to end up in landfills.

There are some great trends in sustainability amongst NZPPI members and supporting these initiatives will increase the sustainability of the industry overall. New technology exists and is becoming increasingly available, so information sharing can help support businesses through this transition period.