

A close-up photograph of green grass blades covered in small, clear dew drops. The grass is vibrant green and the dew is glistening. The background is slightly blurred, focusing attention on the foreground blades.

CLIMATE STATEMENTS

FY 2024



ArborGen
— HOLDINGS —

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IMPORTANT NOTICE

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Welcome to our Climate Statements for FY24

As a horticultural business, ArborGen Holdings Limited's (**ArborGen, "we" or "our"**) operations are inherently linked with climate. Climate change presents both risks and opportunities for our business. Identifying, monitoring, mitigating and responding to climate-related events forms an integral part of ArborGen's strategy and operations. ArborGen uses climate related opportunities to understand how we serve people, customers and shareholders, govern the company and protect the natural environment.

This report contains our first climate statements under the Aotearoa New Zealand Climate Standards and covers ArborGen's financial year from 1 April 2023 to 31 March 2024.

We have provided our current assessment of the climate-related impacts, risks, and opportunities material and relevant to ArborGen's business. This report is a point-in-time assessment based on assumptions regarding the future which are inherently uncertain, often outside our control and likely to change. Where relevant, these limitations are set out in this report.

We will continue to monitor the potential impacts of climate change on our business.

For this year, ArborGen has elected to use the following adoption provisions:

Adoption provision	Commentary
Adoption provisions 1 and 2: Current and anticipated financial impacts	A qualitative description of the current and anticipated financial impacts has been provided. A quantitative assessment of financial impacts will be disclosed in our second reporting period.
Adoption provision 3: Transition planning	As part of its annual strategy review, ArborGen will progress towards developing its transition plan. Climate-related risks and opportunities will be an ongoing part of ArborGen's strategic planning process.
Adoption provision 4: Scope 3 GHG emissions	Scope 3 emissions will be reported in our second reporting period.
Adoption provision 6 and 7: Comparatives and trends	ArborGen is at the early stage of its emissions measurement journey and FY24 is the first year of reported data.

ArborGen confirms these climate statements comply with the Aotearoa New Zealand Climate Standards.



David Knott
Chairman of the Board



Paul Smart
Chair Audit and Risk Committee

30 July 2024

Governance

Board of Directors

The ArborGen Board is responsible for the oversight of climate-related impacts, risks and opportunities. Due to the size and nature of the business, the whole Board takes overall responsibility for sustainability and climate-related risks and opportunities. The Board also reviews ArborGen's ESG and sustainability policies regularly.

The ArborGen Directors possess competencies in this area and all Directors are responsible for continuous training and keeping themselves informed on relevant climate issues. ArborGen's Board competency framework includes skills and experience relating to climate risk as a relevant consideration. The Board will continue to have information from relevant climate experts as part of the Board schedule to monitor new developments.

To assist the Board, the Audit and Risk Committee (**ARC**) identifies and considers all relevant climate matters at least annually and as significant risks and opportunities arise. ArborGen has also engaged external experts to provide additional knowledge and assist with disclosures and reporting.

The Board generally meets at least four times per year and receives recommendations and insights from management and the ARC, including on climate-related issues. The Board reviews these reports and ensures proper implementation of internal controls and risk management processes. As part of its annual strategy review, the Board considers the influence of climate change and devises strategies for the short, medium and long term.

ArborGen is at the early stage of its carbon measurement journey. With the data now available, ArborGen will consider appropriate targets and initiatives to achieve them. The Board will approve these metrics and on an annual basis monitor progress against these targets through regular reporting from management.

Management's role

Day-to-day responsibility for identifying and implementing strategic initiatives related to climate risk and carbon emissions sits with the executive team.

ArborGen appointed a new VP Operations, starting in March 2024, with delegated responsibility from the CEO to identify, manage and report climate-related issues.

Management report to the ARC, and the Board, on climate related risks and opportunities on a quarterly basis. Management is responsible for assessing the impact of climate on the business and ensuring mitigation plans are in place.

Each business unit is also tasked with identifying climate-related risks and opportunities relevant to their function. ArborGen's risk register is updated with any new material information.

Board

- Oversight and governance

Audit and Risk Committee

- Additional risk assessment of climate related activities
- Review appropriate countermeasures to mitigate risks

Management

- Vice President of Operations – ensures overall climate risks are continuously assessed and reviewed. Ensures controls are in place to mitigate risks
- Chief Financial Officer – ensure compliance to policies, ensure risks are appropriately assessed and scenario analysis is financially assessed and reported.

Strategy

ArborGen is the leading provider of advanced genetics seedlings for the forest industry. We use our technology platform, production capabilities and sales and marketing to transform forest productivity.

ArborGen is committed to conducting business in the right way, ethically and in line with legal and regulatory obligations, to ensure we add long term value to staff, contractors, shareholders and other stakeholders. Our ESG principles provide meaning beyond just commercial gain, and look to how we serve our stakeholders, govern the company and protect the natural environment for now and the future.

Current climate-related impacts

As a horticultural business, climate risks are inherent to the sector. Managing these risks is a critical part of business management and a specific item in our risk register. In addition, the increasing emphasis on the role trees can play in offsetting carbon emissions through sequestration is creating new climate-related opportunities for ArborGen.

Currently ArborGen has sites across the southern part of the United States (Alabama, Arkansas, Georgia, Florida, Texas, and South Carolina) and multiple locations in Brazil (mainly in the southern regions).

As our business operates mostly outdoors, we face risks from excessive rains, hail, freezing, hurricanes, drought and excessive heat. In the past, we have had entire crops destroyed at individual locations due to extreme weather events, so ArborGen knows what extreme weather can do to our business.

Climate and weather and the impacts it can have on our business are, and have been, ingrained into our business practices for more than 30 years. We feel confident that we have already taken many steps to protect our assets from extreme weather, in particular excessive rains.

Table 1 – Current climate-related impacts

Business area	ArborGen’s current physical and transition climate-related impacts for FY24
Business model (including operations) and value chain	A series of extreme weather events across ArborGen’s Southern US operations caused varying degrees of damage to nurseries and orchards. Significant events included a severe hail event in the US that impacted ArborGen’s Jasper nursery with an estimated crop loss of 8 million seedlings. In May 2024; Jasper, TX, Bullard TX, Livingston TX and Bluff City AR experienced approximately 30% of its average annual rainfall in this one month. This impacted ArborGen’s planting and production practices that are both critical for timely growth of seedlings and fulfilling customers’ orders.
Operating costs	<p>The impact of extreme weather events on ArborGen has resulted in increased insurance claims and operational costs due to damaged nurseries, orchards and other infrastructure. In 2023, ArborGen filed a significant insurance claim for damage to its nursery in Bluff City AR, following an intense weather period.</p> <p>While it isn’t a material impact in this current reporting year, ArborGen will continue to monitor insurance claims related to climate-related events. ArborGen has acknowledged that the costs incurring from damage to our key infrastructure and product, could be material in the future.</p>

Based on this history, and our current strategy, we consider that we are well positioned to mitigate risks and respond to opportunities arising from the transition to a low-emissions, climate resilient future.

Climate scenario analysis

To prepare our first climate statements under the Aotearoa New Zealand Climate Standards, we conducted a standalone climate scenario¹ analysis process to identify material climate-related impacts, risks and opportunities across three different futures and test our business. Scenario analysis is a strategic tool for understanding and exploring how the future may develop under conditions of uncertainty. The outcome of this process will be used to inform ArborGen's strategy.

This process involved:

- Engaging external consultants (**WSP New Zealand Ltd**) to support our climate scenario analysis, our identification and assessment of climate-related risks and opportunities, and the development of some metrics for vulnerability to climate-related physical and transition risks.
- Running a series of workshops with its staff and executive management (Chief Executive, Chief Financial Officer, Vice President of Operations, and General Manager of Operations (Brazil)), which involved:
 - starting with publicly available information for the agricultural sector;
 - defining scenario parameters for ArborGen's climate scenarios;
 - aligning ArborGen's climate scenarios with the Aotearoa New Zealand Climate Standards and accompanying guidance from the External Reporting Board (**XRB**) and Financial Markets Authority;
 - refining ArborGen's scenario narratives and climate-related risks and opportunities; and
 - identifying metrics for physical and transition risks, and climate-related opportunities.
- Board review, consideration, and approval of the scenario analysis process and outcomes.

We have not conducted any modelling, nor quantitative financial impact assessments.

We consider that the scenarios below are the most relevant and appropriate to assessing ArborGen's resilience and strategy because they are built on widely-used, international baselines adapted to ArborGen's primary production areas.

Time horizons

We selected three time horizons for our climate scenarios and climate-related risks and opportunities aligned with our production lifecycles for our seedlings and forecasted adoption of advanced genetics.

Table 2 – Time horizons

Time horizon	Year	Rationale
Short term	2024-2030	1-7 years, aligned with seedling production cycle
Medium term	2031-2040	7-15 years, reflecting seedling maturation and the increasing uptake of advanced genetics in the market across the US and Brazil forestry sector
Long term	2041-2050	>15 years, through to 2050

¹ Climate scenarios are plausible and challenging descriptions of how the future might look; they are not predictive or probabilistic. Scenario pathways are developed based on a coherent and internally consistent set of assumptions about key driving forces and relationships covering both physical and transition risks in an integrated manner.

Data sources

To develop climate scenarios relevant to ArborGen’s operational geographies in South America and the Southern US (the states of Alabama, Arkansas, Georgia, Florida, Texas, and South Carolina), we selected the Intergovernmental Panel on Climate Changes (**IPCC’s**) SSP-RCP² global scenarios and pathways.

ArborGen uses weather and climate data from the United States federal agency the National Oceanic and Atmospheric Administration (**NOAA**) for its Southern US operations and Probable Futures for operations in Brazil.³ Through these data sources, ArborGen can assess exposure to climate hazards across its sites. This can be used for the long term planning and as a tool within ArborGen’s risk management framework for its physical climate-related risks and opportunities.

Table 3: Scenario archetypes used to construct ArborGen's scenarios

Scenario archetypes	Orderly	Too little, too late	Hot house world
Shared Socio-economic Pathways (SSP-RCP)	SSP1-1.9: Sustainability, very low GHG emissions	SSP2-4.5: Middle of the road, low GHG emissions	SSP3-7.0: Regional Rivalry, high GHG emissions
Representative Concentration Pathways (RCP)	RCP2.6	RCP4.5	RCP8.5

Temperature outcomes and emissions reduction pathways

ArborGen’s climate scenarios focus on three temperature outcomes and emissions pathways aligned with the requirements of the XRB. These support us in exploring the diverging risks and opportunities of each scenario pathway.

² [Shared Socio-economic Pathways \(SSPs\)](#) are baseline narrative scenarios that identify socio-economic assumptions, geopolitical assumptions and economic and technological trends. These form the basis for modelling the IPCC’s SSP-RCP scenarios, which combine the baseline SSP scenarios with radiative forcing levels from the Representative Concentration Pathways (**RCPs**) to impose global warming targets.

³ With limited climate science and data publicly available for Brazil, ArborGen has referenced the Probable Futures data on climate projections for Brazil. Probable Futures is a not-for-profit climate literacy initiative that uses a simulation framework: CORDEX-CORE(8). The scale of data provided through this source creates a notable degree of confidence.

Table 4: Temperature outcomes and emissions pathways for each scenario

Scenario archetypes	Orderly	Too little, too late	Hot house world
Temperature outcome (2100)	1.5°C	2.7°C	>3.0°C
Temperature outcome at endpoint (2050)	1.6°C	2.0°C	2.1°C
Emissions pathway	SSP1–1.9: “The world shifts gradually, but pervasively, toward a more sustainable path, emphasising more inclusive development that respects perceived environmental boundaries.”	SSP2–4.5: “The world follows a path in which social, economic, and technological trends do not shift markedly from historical patterns. Development and income growth proceeds unevenly, with some countries making relatively good progress while others fall short of expectations.”	SSP3–7.0: “A resurgent nationalism, concerns about competitiveness and security, and regional conflicts push countries to increasingly focus on domestic or, at most, regional issues. Policies shift over time to become increasingly oriented toward national and regional security issues.”

Underlying assumptions

ArborGen’s scenarios draw on the underlying assumptions of the IPCC SSP-RCP scenarios and emission reduction pathways. These scenarios cover the assumptions required to be disclosed by the XRB, including: policy and socioeconomic assumptions; macroeconomic trends; energy pathways; carbon sequestration from afforestation and nature-based solutions and technology assumptions including negative emissions technology. ArborGen’s intention is to ground its selected scenarios in credible and commonly adopted assumptions to create logical climate scenarios for primary users to compare against others in the same sector. The IPCC’s scenarios qualify.

ArborGen’s scenario narratives

Development of ArborGen’s scenario narratives was informed by an understanding of driving forces that have the greatest influence in shaping future outcomes for ArborGen.

These tables provide narrative descriptions of ArborGen’s three climate scenarios.

Table 5: Orderly scenario

End of century global temperature outcome	Relative level of physical impacts	Relative level of transition impacts	SSP-RCP scenario
1.5°C	Moderate (in the short-medium term)	High (in the short term)	SSP1-1.9

The world moves deliberately toward prioritising the health of the planet. Governments work together to achieve the Paris Agreement’s Net Zero 2050 pledge and the commitments of the Kunming-Montreal Global Biodiversity Framework. Biodiversity and the wellbeing of people significantly improves. ArborGen encounters generally stable economic and environmental conditions and continues to work in an orderly manner to adapt to climate change.

Consumer behaviour shifts, prioritising both sustainability and re-use of materials as well as an increased focus on carbon sequestration. ArborGen experiences increased sales to supply stock for reforestation and afforestation projects. Forestry remains an attractive sector to work in. ArborGen benefits from this and promotes itself as an employer of choice in an environmentally conscious society.

The increasingly challenging climate grows demand for trees with increased resistance to climate and pathogens. ArborGen invests in research and development to diversify its seedling varieties. Technology advancement eases the pressure of labour shortages as the adoption of automated methods makes ArborGen’s operations more efficient and resilient.

The physical impacts of climate change still present challenges to ArborGen in an Orderly scenario, including periods of drought and flooding events. Climate events occur periodically but due to active investment in resilient materials for the infrastructure of its orchards and nurseries, ArborGen is prepared and anticipated impacts are manageable.

Banks and other lenders prioritise sustainability. This creates significant opportunities for ArborGen to utilise green bonds and sustainability linked loans (SLLs). Many of ArborGen’s customers also have increased access to capital associated with sustainability linked lending.

Strong land-use change regulation is enforced to protect ecosystems. Deforestation is eliminated completely in some regions and vastly restricted in others. ArborGen’s customers are incentivised to scale up reforestation and afforestation projects with the prioritisation of sustainable materials (timber) and new policy for carbon sequestration and reforestation. This demand generates more sales for ArborGen.

Table 6: Too little, too late scenario

End of century global temperature outcome	Relative level of physical impacts	Relative level of transition impacts	SSP-RCP scenario
>2.0°C	Moderate (in the short-medium term) - High (in the long term)	Moderate (in the short term) – Severe (in the medium term)	SSP2-4.5

Uncoordinated policy ambition and unsuccessful transition planning globally sees worsening physical climate change impacts and geopolitical tensions. Abrupt policy changes in the medium to long term exacerbate inequalities in society, sectors, and regions. Political parties globally eventually coordinate priorities and efforts to deal with climate change, but displacement and impact has been realised for and on communities, ecosystems, and industries.

Under this scenario, ArborGen’s business faces increased extreme weather events and related challenges. Some growing seasons shift, impacting ArborGen’s distribution cycles while changing regional climates require ArborGen to relocate some orchards and nurseries. Adaptation methods are implemented for both ArborGen’s infrastructure and processes, including modified growing methods and continued research into advanced genetics to create seedlings better suited to the evolving climate. ArborGen invests in resilient materials for the infrastructure of its orchards and nurseries to reduce the impact of extreme weather events. After 2050 physical climate change impacts worsen.

Unlike farming and other industries in the primary industries sector, forestry incentivises jobs and the desirability to work through its known contribution to the bioeconomy and carbon sequestration. This creates greater opportunity for ArborGen to become an employer of choice and increases the supply of available labour and labour flexibility to ArborGen.

Consumer behaviour shifts towards prioritising carbon sequestration as a positive mitigation for the transition towards a low carbon world in the late 2030s. This increases demand from ArborGen’s customers for seedling stock.

The role of carbon sequestration and reforestation becomes prominent in attempts to stabilise carbon emissions. To match this demand, ArborGen invests in technologies for developing genetically advanced seedlings that maximise carbon sequestration. ArborGen experiences a significant uptake in sales to boost forestry. The increasing necessity for resilience in trees sees ArborGen invest in technologies to strengthen the adaptability of its seedlings.

Table 7: Hot house world scenario

End of century global temperature outcome	Relative level of physical impacts	Relative level of transition impacts	SSP-RCP scenario
>3.0°C	Moderate - High (by the medium term) – High (in the long term)	Low (with a slow but steady increase over time)	SSP3-7.0

The world continues with business as usual for the coming decades. Globally, an economic and social development focus built on fossil-fuel intensive growth yields little climate regulation.

ArborGen is frequently impacted by extreme weather events including flooding, hurricanes, and drought, leading to possible supply chain disruptions and changes in customer buying behavior. To cope with the severity of events ArborGen invests in resilient materials for the infrastructure of its orchards and nurseries to reduce the impact of extreme weather events. After 2050 physical climate change impacts worsen significantly.

Severe flooding events erode soil and ArborGen’s bare root seedlings are exposed, leading to damage. Hurricanes and flooding drive ArborGen to diversify its locations across the US and Brazil to increase the security of its stocks. Drought sees increasing restrictions on water and changes to soil composition which are vital components for successful seedling growth. The conditions become increasingly favorable for pests and pathogens.

The need for adaptation and resilient infrastructure re-builds sees an increase demand for building materials including timber. ArborGen is a key player in this increase. Distribution times may be impacted by seedling production and supply chain disruptions through climate-related events. Input costs associated with carbon are likely to increase.

In the long term, access to labour is impacted as migrant workers are disrupted by extreme weather events and the inability to travel. ArborGen’s Brazil operations rely on migrant workers, and productivity is negatively impacted.

The frequency and severity of extreme weather events spotlights the advantage of genetics technology to increase the adaptability of seedlings and trees to unfavorable conditions. The US government reconsiders its stance on biotechnology in the forestry sector and creates incentives to financially sustain the sector.

ArborGen invests into technologies to both strengthen the resilience of its seedlings and increase the carbon capture capacity, gaining a competitive advantage.

Impact assessment of climate-related risks and opportunities

The key climate issues and related physical and transition impacts for ArborGen are in table 8.

We will continue to monitor and consider these risks and opportunities as part of our internal capital deployment and funding decisions. Climate related risks and risk mitigation is one of the criteria for capital deployment and funding decisions as it is a key for risk mitigation. For example, we are currently reviewing investments in key locations both in South America and the Southern US to ensure production is diversified across the region. Additionally, ensuring production is split across a diverse area will mitigate not only weather-related events, but also ensure supply chain risks are mitigated. All funding decisions are made by the ArborGen leadership team, which includes the CEO, CFO, Vice President of Operations, and the Sales Director. All investments are also taken to the Board for approval.

Table 8: Impact assessment for ArborGen's climate-related transition, physical risks and opportunities for FY24

Risk / opportunity	Type	Potential business impacts	Risk rating	
Weather related events including excessive sudden rain, freeze events, drought conditions, hurricanes	Physical risk	<p>Climate-related risks and weather events are material risks within ArborGen’s existing Risk Management Framework. The nature of ArborGen’s operations make climate and weather an integral part of its business operations across all geographies. ArborGen's seedling production cycle is highly dependent on consistent weather, with extreme weather events already causing significant damage. Sudden heavy rainfall within the first 4-6 weeks post-planting can wash out seeds and damage seedlings, while pre-lifting heavy rain creates anaerobic conditions that harm seedling roots. Freeze events before and during lifting can cause root damage and freeze events that occur during pollination reduce annual seed volumes and harvests.</p> <p>Increased hurricane frequency leads to large-scale damage to orchards and nurseries, potentially necessitating relocation. Higher temperatures cause early seedling development, shortening seasons and can affect the timing of flower bagging - while hot, dry conditions negatively impact seed germination. Additionally, weather impacts also affect ArborGen's critical infrastructure causing delay and disruption to business activities.</p>	Short term	Medium
			Medium term	High
			Long term	Very High
Climate change disrupts supply chain including labour	Physical and transition risk	<p>Climate change can significantly impact ArborGen’s supply chain and labour forces, primarily through extreme weather events. Disruptions such as flooding, and droughts can damage infrastructure, delay transportation, and interrupt production schedules, leading to increased costs and inventory shortages. There are periods of production where ArborGen requires increased labour levels, and there is a likelihood of climate weather events disrupting the flow of labour and resources to orchards and nurseries throughout the US and Brazil. For the geographically isolated nurseries and orchards, particularly those in Northern Brazil, accessibility may be limited in the case of extreme weather events restricting supply. In Brazil, the already limited window of planting could be disrupted if the supply chain is implicated, resulting in late deliveries to key customers.</p>	Short term	Low
			Medium term	Low – Medium
			Long term	Medium

Risk / opportunity	Type	Potential business impacts	Risk rating	
Failure to meet customer and stakeholder expectations regarding climate risks and their management	Transition risk	ArborGen has a responsibility to its stakeholders and customers to uphold their expectations when it comes to climate risk and management. Failure to meet these expectations could lead to reduced investor confidence and potentially lower stock valuations. Inaction or ineffective action to take steps to improve ArborGen's climate responsibility may also impact customer perception of the brand and the confidence they have in the ArborGen product. Failure to comply with new and developing climate regulations set in the USA and Brazil, is likely to diminish stakeholder confidence.	Short term	Low
			Medium term	Low
			Long term	Medium
Introduction of industry-related regulations and other market complexities influencing consumer and customer demand	Transition risk	The demand for ArborGen's seedlings can change due to various factors, including shifts in consumer preferences, larger economic trends and regulatory changes. The market for ArborGen products may also face turbulent periods in times of regulatory change in areas aimed at biodiversity protections, reducing deforestation and other sustainability practices. ArborGen has invested in the production of a core range of seedlings, therefore, if regulations and other factors were to cause shifts in demand for those seedlings this would require a significant change to ArborGen's business model. Increased costs may also flow from a shift in customer preference towards FSC certified products. Increased costs will be incurred in obtaining this certification and maintaining it. Acute weather events and chronic climatic changes, potentially reducing supply, will have an impact on general market demand and prices for seedlings. Where the demand fluctuates, there is a risk that ArborGen may not have the required inventory levels.	Short term	Low
			Medium term	Low
			Long term	Low

Risk / opportunity	Type	Potential business impacts	Risk rating	
Increased demand for advanced genetics seedlings which have greater resistance to disease, weather and pests	Opportunity	There is an opportunity for ArborGen to continue increasing investment into research and development in its pursuit of breeding seedling varieties with greater resistance and adaptability to disease, weather and pests. Product diversification will help to protect ArborGen from any potential changes in the market for its core product offerings. There is potential to partner with other projects and companies to strategically increase investment into R&D. Partnerships can also provide an opportunity whereby partners can produce ArborGen's own genetic material – without requiring a need for expanding ArborGen's own nurseries and orchards. As customer demand and preferences for sustainable products increases over time, there is an opportunity to increase investment and production of genetic material in seedlings with enhanced carbon sequestration.	Short term	Medium
			Medium term	Medium
			Long term	Medium - High
Increased customer demand for seedlings for afforestation and reforestation	Opportunity	As the market increasingly shifts towards reforestation and afforestation projects and sustainable materials, ArborGen could obtain a greater market share and enhanced competitive advantage for its product. ArborGen can respond to changing customer and consumer behavior and preferences through its R&D investment. There is an opportunity for ArborGen to continue to actively engage with carbon project developers who are pursuing large scale afforestation and reforestation projects in the Southern US and Brazil. Currently, ArborGen has one long term supply arrangement to provide both advanced genetics pine seedlings and hardwood seedlings. ArborGen should aim to continue seeking out similar long-term supply contracts.	Short term	Low
			Medium term	Medium
			Long term	High
Financial incentives for reforestation and promoting sustainable forest management practices eg, carbon credits	Opportunity	ArborGen will consider integrating sustainability into its operations to access a broader range of financing options, including green bonds, sustainability-linked loans, and impact investments. These financial instruments often attract investors who prioritise ESG considerations, thereby diversifying funding sources and potentially reducing borrowing costs. In the US forestry industry, financial incentive arrangements geared towards sustainability measures are currently allocated and targeted to not for profits, but this could change over time. There is an opportunity for private sector companies like ArborGen to potentially access more.	Short term	Low
			Medium term	Low – Medium
			Long term	High

Risk Management

To identify and assess risks, ArborGen draws on our internal forestry specialists, external consultants, and current published scientific literature from various universities, USDA, EPA, NOAA, PNA and other National Forestry related entities. Assessment of these risks is conducted on a quarterly basis.

We assess our risks across all aspects of our value chain using the following time-horizons:

Table 9 – Risk management time horizons

Time horizon	Year	Rationale
Short term	2024-2030	1-7 years, aligned with seedling production cycle
Medium term	2031-2040	7-15 years, reflecting seedling maturation and the increasing uptake of advanced genetics in the market across the US and Brazil forestry sector
Long term	2041-2050	>15 years

Our risk assessment process considers the likelihood of the risk occurring and the likely severity of its consequences. Given the evolving impacts of climate change, ArborGen also assesses the vulnerability of the business to gradual and progressive impacts. We consider the hazard, exposure to the hazard, and the vulnerability of the system or process to the hazard.

Climate related risks are integrated into ArborGen’s Risk Management Framework. This means that climate change risks are tested and prioritised using the same methodology as all other risks.

Management reports on these risks to the ARC and the Board on at least a quarterly basis, including for incorporation into ArborGen's Risk Management Framework if necessary.

Key operational risks, including climate risks, form part of the annual risk management plan approved by the Board.

Our Risk Management Framework implements risk mitigation procedures for climate risks including:

- the geographical spread of production,
- tiling and field topography improvements,
- SOPs for soil moisture and other types of controls,
- irrigation systems; and
- the use of nets and other equipment to combat weather issues.

Metrics and Targets

ArborGen's greenhouse gas (GHG) inventory

ArborGen's primary source of Scope 1 and 2 emissions is electricity use and transport fuel emissions associated with orchard equipment and business travel. Because ArborGen is working on improving the availability of quality data on its scope 3 emissions, we have chosen to rely on adoption relief provision 4 for our first climate statement. We will include scope 3 emissions in our next reporting period.

Table 10: ArborGen's GHG emissions inventory

Scope	Category	FY23/24 tCO ₂ -e
Scope 1: Direct emissions	Gasoline	690.8
	Diesel	990.2
	Other	94.7
	Subtotal	1,775.7
Scope 2: Indirect emissions (location-based)	Electricity consumption (purchased from the grid)	2,071.2
	Subtotal	2,071.2
TOTAL Scope 1 and 2 emissions		3,846.9

GHG Emissions intensity metric

US\$67,700,000/3,846.9 = US\$17,416.62 of total sales revenue (from ArborGen's FY24 Annual Report and Financial Statements) per tCO₂-e (Scope 1 and Scope 2 as per the inventory above)

US\$24,000,000/3,846.9 = US\$6,238.78 of gross profit (from ArborGen's FY24 Annual Report and Financial Statements) per tCO₂-e (Scope 1 and Scope 2 as per the inventory above)

This inventory has been prepared in accordance with the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard 2004 (**GHG Protocol**), with guidance provided by Greenhouse Gas Protocol: Technical Guidance for Calculating Scope 3 Emissions (version 1.0) (**Technical Guidance**) and reference to the emissions and global warming potential factors in the Ministry for the Environment's 2023 Detailed Guide for Measuring Emissions for Organisations (**MfE Guide**) and US EPA's GHG Emission Factors Hub (**EPA**).

ArborGen has applied the operational control consolidation approach to its GHG inventory. All emissions that ArborGen has direct control over in its own head office in Ridgeville, South Carolina; nurseries, seed orchards, distribution and research facilities located throughout Unites States, and Brazil are covered in this inventory. Direct control is determined by ArborGen's capacity to enact operational decisions for an emissions source. No facilities or operations have been excluded from the report.

Assurance

The inventory has not been externally assured but will be from our second reporting period. ArborGen is not required to have an GHG inventory undergoing external assurance for its first reporting period. However, with the phasing in of Aotearoa New Zealand Climate Standards, external assurance will be required for reporting periods ending after October 2024 .

Climate-related risks and opportunities metrics

Climate reporting within the forestry sector is still developing. We are not aware of industry-based metrics for measuring and managing climate-related risks and opportunities beyond our GHG emissions. However, we are monitoring developments in this space and will consider new metrics in future reporting years.

ArborGen has not yet set specific KPIs to measure and manage climate-related risks and opportunities. Our current strategic pillars have many aspects of our business strategy which could be said to align with climate-related risks, including relating to ArborGen's expansion in Brazil, optimising productivity, and a focus on market-driven genetics in the future.

Climate related metrics are not currently incorporated into ArborGen's remuneration policies. The Remuneration Committee will consider incorporating climate-related performance metrics for relevant roles, if appropriate.

ArborGen has not yet developed an internal emissions price.

Assets vulnerable to transition risks

We consider that all of our facilities are vulnerable to the transition risks including supply chain disruptions to varying degrees. In the absence of past and projected data relating to supply chain disruptions, ArborGen has assessed the financial impact of reduced labour following the impacts of COVID-19. The estimation can be used as a rough proxy to represent supply chain disruptions that may occur in the future due to climate-related impacts. Our Riba di Rio Pardo nursery experienced a significant reduction in labour levels during COVID-19, reducing production volumes by 10 million seedlings and increasing total cost of production. Therefore, ArborGen's total lost sales equated to over US\$613,000 (R\$3.1 million) per year.

Assets aligned with climate-related opportunities

ArborGen's assessment of assets aligned with climate-related risks and opportunities reveals that approximately 75% of our assets are aligned with climate-related risks. 50% of our intangible assets are aligned with 50% of our opportunities. This is based upon the direct correlation of where are assets are located and the exposure of risk they have related to climate events.

Capital expenditure deployed towards climate-related risks and opportunities

In light of this, ArborGen has devoted US\$300,000 in 2024 for climate related capital expenditure. ArborGen is continuously evaluating other assets for investment (within the US\$1-4 million range) which will diversify risk by moving production to multiple site locations. Further, in recognition of maintaining a competitive advantage by developing superior proprietary genetics, ArborGen has invested approximately US\$3.7 million in research and development of which approximately 48% is associated with advanced genetic seedlings which have greater resistance to disease, weather and pests. These dollars are associated with our R&D spend in the product families with these specific trait characteristics.

ArborGen's metrics for managing its climate-related risks and opportunities

ArborGen is developing appropriate metrics for its climate-related risks and opportunities. We will continue that development in FY25 and aim to have additional metrics for our second reporting period.

Physical risk exposure assessment

WSP New Zealand Ltd supported ArborGen with an exposure assessment⁴ of ArborGen's sites impacted by the physical risks of drought and flooding due to climate change. This work was not a physical risk assessment – the vulnerability of ArborGen's sites was not assessed at this stage. Detail on the methods, assumptions and limitations of the exposure assessment is set out in the Appendix to this report.

To identify ArborGen's exposure to drought and flooding, a desktop assessment was conducted using climate change adjusted data projections for flooding and drought risk. These data projections were analysed to assess the number of ArborGen's key assets (nurseries, partner nurseries) exposed across Southern United States (US) and Brazil (31 sites total).

Four simplified maps have been prepared to visualise the areas exposed to drought and flooding. These maps aim to identify where ArborGen's most exposed sites are for two climate scenarios aligned with ArborGen's climate scenario analysis: 'Too little, too late' and 'Hot house'. Each metric includes a brief description of the methodology followed, key assumptions and limitations of the assessment for ArborGen to disclose.

ArborGen acknowledges that further maturity of this assessment is required to assess the vulnerability of assets and business activities to climate hazards. We will look to complete a detailed physical climate risk assessment for each of our sites, including considerations for our value chain such as key export lines.

Drought

The exposure assessment of ArborGen's nurseries located in the US and Brazil to drought in 2050 utilised data from the World Bank Group Climate Change Knowledge Portal. Exposure to drought is presented in ranges using the Standardised Precipitation - Evapotranspiration Index (SPEI). The assessment has been conducted for two of ArborGen's scenarios: 'Too little, too late' and 'Hot house'. Data based on the IPCC's Sixth Assessment scenarios SSP2-4.5 and SSP3-7.0 was used for the 'Too little, too late' scenario and 'Hot house' scenarios respectively.

The SPEI is a multiscalar drought index based on climatic data. It is used to determine the onset, duration and severity of drought conditions compared to normal conditions. A higher SPEI index means decreased drought conditions and a lower SPEI index means increased drought conditions.

The results provided here help ArborGen to better understand the projected future exposure of its nurseries to drought in the geographies in which it operates.

⁴ Exposure is defined as: "The presence of people; livelihoods; species or ecosystems; environmental functions, services, and resources; infrastructure; or economic, social, or cultural assets in places and settings that could be adversely affected" (XRB Climate-related Disclosures Staff Guidance, pg. 25 in reference to IPCC, 2022 Full Report, p.43). Exposure is one component of assessing physical climate risk. A physical climate risk assessment typically assesses both exposure and vulnerability.

Table 11: Percentage of ArborGen's US sites exposed to SPEI drought index ranges

SPEI index range	Too little, too late scenario*, 2050		Hot house scenario*, 2050	
	Number of US ArborGen nurseries located in range	Percentage (%) US ArborGen nurseries located in range [†]	Number of US ArborGen nurseries located in range	Percentage (%) US ArborGen nurseries located in range [†]
1 to 2	0	0%	0	0%
0 to 1	4	57%	4	57%
-1 to 0	3	43%	3	43%
-2 to -1	0	0%	0	0%

*Data based on SSP2-4.5 and SSP3-7.0 was used for the 'Too little, too late' and 'Hot house' scenarios respectively.
[†]Percentage (%) figures have been rounded to the nearest whole number.

Table 12: Percentage of ArborGen's Brazil sites exposed to SPEI drought index ranges

SPEI index range	Too little, too late scenario*, 2050		Hot house scenario*, 2050	
	Number of Brazil ArborGen nurseries located in range	Percentage (%) Brazil ArborGen nurseries located in range [†]	Number of Brazil ArborGen nurseries located in range	Percentage (%) Brazil ArborGen nurseries located in range [†]
1 to 2	0	0%	0	0%
0 to 1	6	25%	6	25%
-1 to 0	18	75%	18	75%
-2 to -1	0	0%	0	0%

*Data based on SSP2-4.5 and SSP3-7.0 was used for the 'Too little, too late' and 'Hot house' scenarios respectively.
[†]Percentage (%) figures have been rounded to the nearest whole number.

Fluvial Flood

ArborGen’s exposure to fluvial (riverine) flood in 2050 was assessed using data from Aqueduct Floods. The following tables indicate where ArborGen’s sites are potentially exposed. These are sites identified within the flood plain of a 100-year return flooding event for either an RCP4.5 or RCP8.5 scenario.

Table 13: Percentage of ArborGen's US sites exposed to 1 in 100 year return period fluvial flood event

Scenario	Too little, too late scenario [†] , 2050	Hot house scenario [†] , 2050
Number of ArborGen nurseries exposed to flood hazard*	1 of 7	1 of 7
Percentage (%) of ArborGen nurseries exposed to flood hazard*	14%	14%
*Calculated based on exposure to a 1 in 100 year return period fluvial (river) flood event.		
†Data based on RCP4.5 and RCP8.5 was used for the ‘Too little, too late’ and ‘Hot house’ scenarios respectively.		

Table 14: Percentage of ArborGen's Brazil sites exposed to 1 in 100 year return period fluvial flood event

Scenario	Too little, too late scenario [†] , 2050	Hot house scenario [†] , 2050
Number of ArborGen nurseries exposed to flood hazard*	1 of 24	2 of 24
Percentage (%)‡ of ArborGen nurseries exposed to flood hazard*	4%	8%
*Calculated based on exposure to a 1 in 100 year return period fluvial (river) flood event.		
†Data based on RCP4.5 and RCP8.5 was used for the ‘Too little, too late’ and ‘Hot house’ scenarios respectively.		
‡Percentage (%) figures have been rounded to the nearest whole number.		

USA: Too Little, Too Late scenario, 2050

Key

 Nursery locations


 Exposed to flood*


SPEI Drought Index

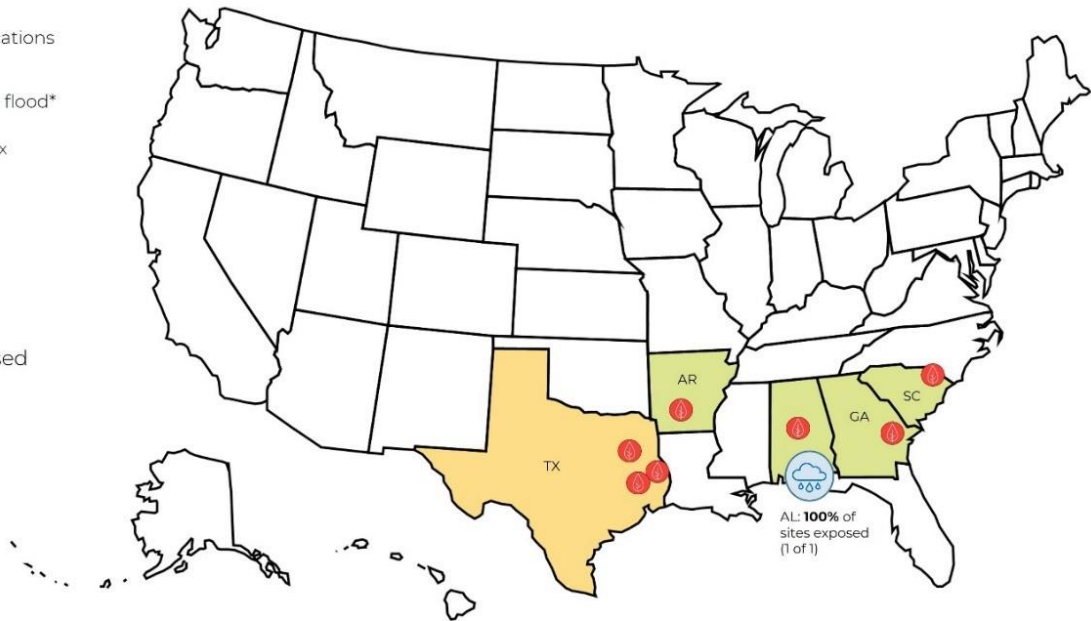
 1 to 2

 0 to 1

 -1 to 0

 -2 to -1

 Not assessed



*Exposed to fluvial (riverine) flooding in a 1 in 100 year return period event.


Brazil: Too Little, Too Late scenario, 2050


Key

 Nursery locations

 Exposed to flood*


SPEI Drought Index

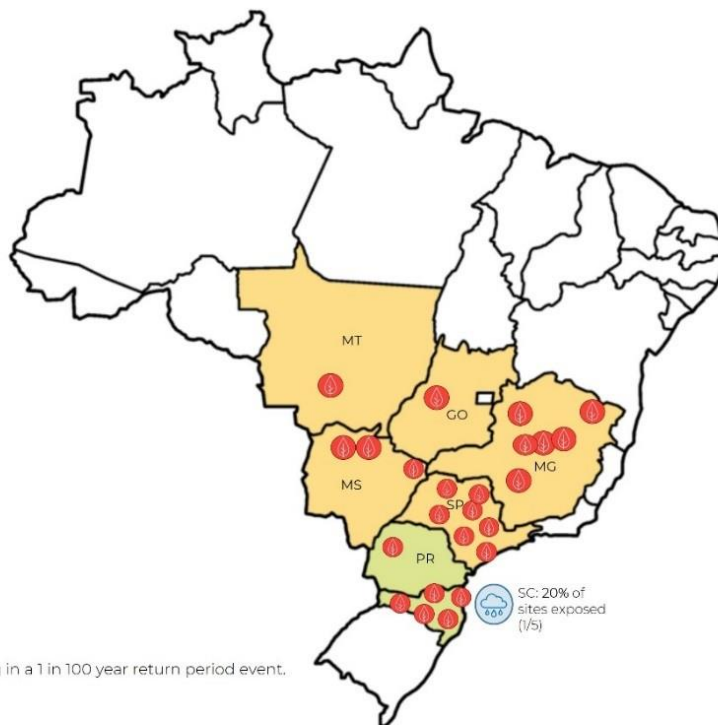
 1 to 2

 0 to 1

 -1 to 0

 -2 to -1

 Not assessed

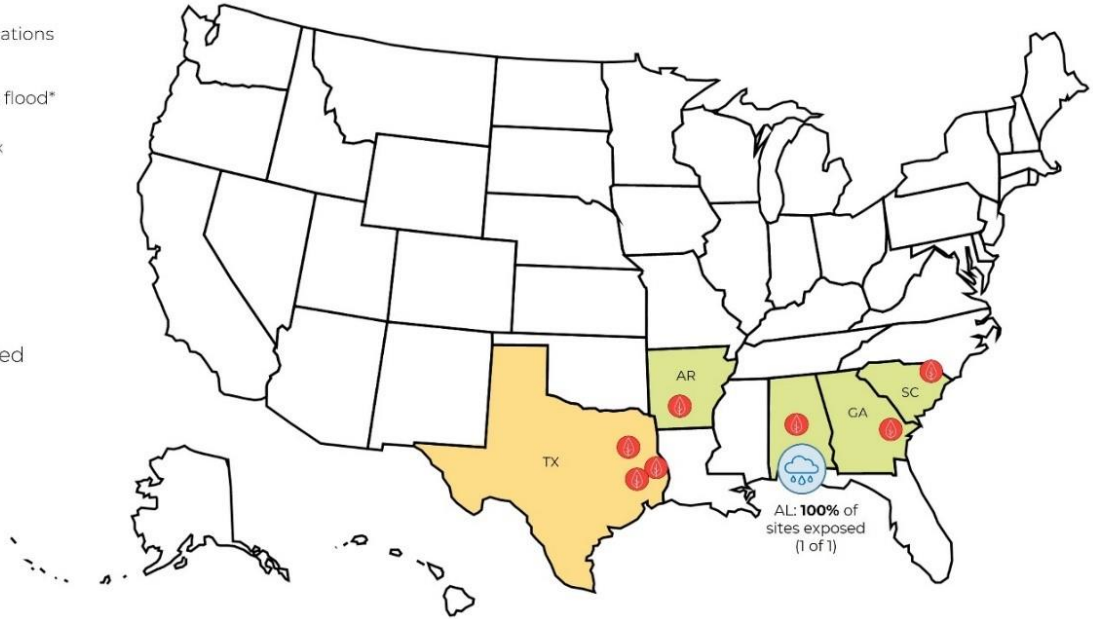


*Exposed to fluvial (riverine) flooding in a 1 in 100 year return period event.

USA: Hot House scenario, 2050

Key

-  Nursery locations
-  Exposed to flood*
- SPEI Drought Index
 -  1 to 2
 -  0 to 1
 -  -1 to 0
 -  -2 to -1
 -  Not assessed

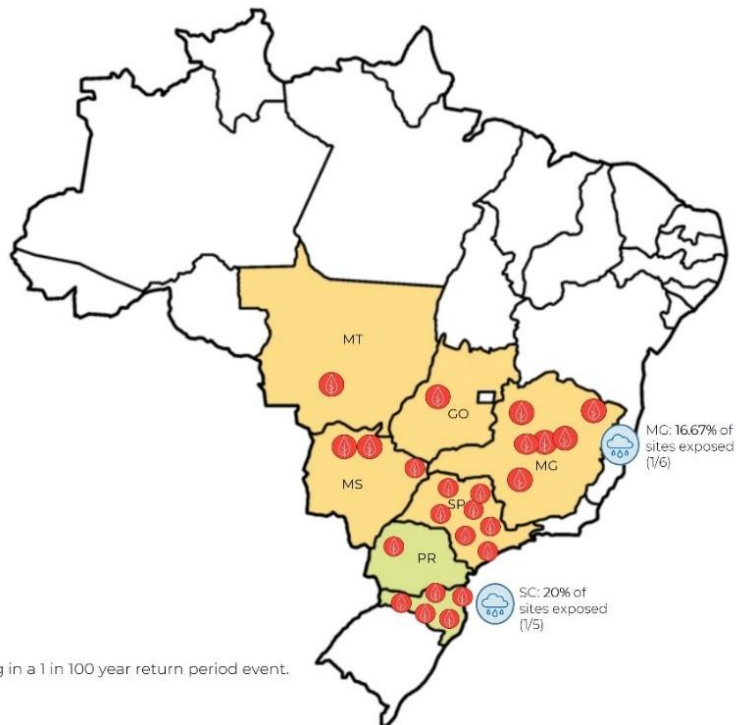


*Exposed to fluvial (riverine) flooding in a 1 in 100 year return period event.

Brazil: Hot House scenario, 2050

Key

-  Nursery locations
-  Exposed to flood*
- SPEI Drought Index
 -  1 to 2
 -  0 to 1
 -  -1 to 0
 -  -2 to -1
 -  Not assessed



*Exposed to fluvial (riverine) flooding in a 1 in 100 year return period event.

Targets

ArborGen has not yet set climate-related targets in our first year of climate reporting.

We intend to set climate-related targets from FY25 and are considering the scope and basis of those targets, including regarding energy use (electricity and gas), GHG emissions, waste reduction / recycling and reducing water consumption at our sites.

Appendix:

Methods, assumptions and limitations

General

The exposure assessment was conducted out to 2050, as this is the endpoint for ArborGen's climate scenarios. ArborGen acknowledges that the most significant divergence in physical climate hazard exposure is projected to occur towards the end of the century (post 2050). This explains why the difference in physical hazard exposure between the "Too little, too late" scenario and the "Hot house" scenario for 2050 does not appear significant. An assessment beyond 2050 would show a significant divergence in exposure between scenarios.

Within the limited timeframe to conduct the exposure study, the best available fluvial flood and drought data was identified. ArborGen acknowledges that higher resolution data could exist at a subregional level and that it intends to investigate the availability of such datasets for use in future assessments.

The assessment only covers ArborGen's nurseries and partner nurseries. It does not cover any other aspects of ArborGen's value chain, such as export lines or customer locations.

Drought

Results of the drought exposure assessment have been presented using ranges (eg 0 to 1). The World Bank data used for the assessment is of a higher resolution. The results have been simplified so they are easier to present visually but still provide a useful output. This simplification means the maps do not show small differences (<1.0 SPEI index change) between the scenarios.

Fluvial flood

The assessment of flood exposure is limited to fluvial (riverine) flooding. It does not cover coastal flooding or pluvial (rain) flooding. Coastal flooding was not covered since none of ArborGen's nurseries or partner nurseries are located near the coast. Pluvial flooding was not covered due to a lack of readily available, suitable data to assess this hazard for the US or Brazil.

The assessment of fluvial flood exposure was conducted via a desktop assessment using visual inspection of the Aqueduct Floods datasets to determine the exposure. No modelling or GIS spatial analysis was conducted. ArborGen sites were deemed to be exposed to fluvial flooding if the site location overlapped with a flood depth of any amount >0 decimetres.

Fluvial flood exposure has only been quantified for the 1 in 100-year flood frequency. The exposure results do not show ArborGen's maximum fluvial flood exposure. Some locations could be exposed to fluvial flood hazard for return periods greater than 1 in 100 years under each climate scenario.

ArborGen acknowledges that the data used to assess fluvial flood exposure is based on the IPCC's Fifth Assessment scenarios: RCP4.5 and RCP8.5. Although these are not the latest IPCC scenarios, this was the best flood data available given time constraints. Data based on the RCP scenarios is still appropriate for a high-level exposure assessment.

Climate change disrupts to supply chain (including labour)

The method used to develop this metric began with analogising past events causing disruptions to ArborGen's supply chain to infer the potential impact on business activities of a significant event in the economy. By referring to COVID-19, ArborGen has selected an illustrative example of non-directly-climate-related supply chain impact on its business. Analogising the impacts of COVID-19 on ArborGen's supply chain to climate-related impacts provides some information, but ArborGen recognises the uniqueness of the potential disruptions of climate-weather related events which will not be transferrable from COVID-19. Understanding the full extent of the financial impact of a supply chain disruption is complex as it is multifaceted issue, requiring extensive data and financial reporting, as well as a deepened understanding of ArborGen's supply chain and how it operates. ArborGen acknowledges that more data and information may exist in relation to its supply chain. We intend to mature our assessment in future reporting years for future assessments (ie for FY25 reporting) to include other aspects of the supply chain, such as logistics and distribution lines.

Opportunity metric (R&D)

R&D spend for genetic materials associated with traits in disease, weather and pests were pulled by product families currently being developed with these genetic characteristics. These traits, regardless of climate change issues, are the big three traits that are consistently sought after in the industry and by ArborGen's customers. Product families are developed that are more resistant to these traits over many generations of breeding and advanced selection processes. Because these traits are largely sought after, the competitive advantages, the associated spending for the trait selections and breeding and other key information associated with these traits can be discerned from ArborGen's annual R&D investments. It should be noted that specific trait characteristics costs cannot be segregated easily if it is combined with other traits within one product family.

GHG emissions data collection, quantification and uncertainties

All GHG emissions data provided is captured by ArborGen's finance and accounting team, in separate files for US sites and for sites in Brazil. All emissions calculations were carried out in Microsoft Excel. The supplied source data was multiplied using the relevant emissions factor. Unless otherwise stated, all emissions factors were sourced from the EPA Emissions Hub 2024.

All measurements and data are based on supplier invoices and records housed in ArborGen's finance and administration system and are largely complete and reliable. Overall accuracy of the emissions profile depends on:

- a) how well the accounting codes reflect the nature of the activities they are designed to cover;
- b) how consistently ArborGen's finance and accounting team apply the accounting codes; and
- c) how accurately and consistently the operational boundaries have been applied to the various accounting codes.

Scope 3 data is more difficult to collect as it includes emission reporting for third parties, for transactions where the emission source is not directly purchased by ArborGen or where the requirement is to capture emissions associated with the use of a natural resource. Scope 3 emissions include business travel, third party freight carriers, refrigerated vans leased by ArborGen and rented to our customers, water usage from wells, lakes, etc, and waste generation. Most of the items in scope 3 will require that the emissions be extrapolated from a measurement that can be used to estimate emissions. For business travel, we will use SAP Concur, which is our travel and entertainment reporting software, to capture additional data related to expense reporting such as mileage for transportation and number of nights purchased for accommodations. For logistics, we invoice van rentals at a daily rate so we can capture days used. We will also track freight mileage through a combination of spreadsheet documentation and/or requesting that freight vendors include mileage on their invoices. We also currently track water usage at some of our sites and will need to investigate our options for putting meters on other water sources where usage is not currently tracked. We are still trying to determine the best measurements for waste which includes everything from office waste to MCP bags. Again, measurements will vary with accounts payable transactions providing the most readily available data. Beyond that, we will look at using the number of employees to extrapolate waste generation, bag counts to extrapolate MCP bag waste, etc.



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