

CARDRONA
ALPINE RESORT / NEW ZEALAND


**TREBLE
CONE**

***OUR
Climate Change
PLAN***

TREBLE CONE VISION 2022

- Treble Cone (TC) is reliable so that it can open and stay open from July every year.
- TC has a fully connected snowmaking system
- TC has reliable power supply from a combination of modern and well-maintained generators, hydroelectric power and main lines (national grid).
- There are toilets in the historical Saddle T Hut and the Altitude Bar has moved to this area as well.
- The 6 pack has been upgraded to allow for downloading so that we can offer sightseeing.
- We have evolved the TC brand to celebrate:
 - the terrain;
 - the view; and
 - the TC tribe as well as a salute to Treble Cone's heritage.

TREBLE CONE VISION 2025

- Treble Cone's base building is upgraded while maintaining its alpine heritage.
- The whole first level of the base building, is open to the public so they can enjoy plenty of space and views.
- Guest services and rental services are integrated at the beginning of the journey, and a smaller staff chill out zone is developed in the old ticket office area.
- Treble Cone will be one of the worlds most coveted wedding and party venues, hosting events all year round with every weekend booked outside of the winter season.
- The view will be famous on social media and used extensively for this region's brand.
- We will have a master plan, in partnership with DOC, for a hiking trail network on the mountain.
- The hydro-electricity plant has developed further to handle 50% of Treble Cone's energy needs. The other 50% is coming from main lines, and the generators are now for backup only.
- Snowmaking is developed fully on the Home Basin trails.
- We have a master plan for lift development including access from the Base Area directly to the Saddle Basin.

OUR PURPOSE

Mana for our mountain
our people
our future

Ka whai mana mō te maunga
Ka whai mana mō te tāngata
Ka whai mana mō āke tōnu



WHERE WE ARE GOING

Strategic priorities



Connection

We have a spiritual connection to our people and place, and always look to the future. Our people are united by a love of the mountains and a shared belief in a life well-lived. The passion, commitment and engagement of our guests is tribal. We nurture the lifelong loyalty of our tribe by cultivating deeper, meaningful relationships with them. Our whanāu has a culture of genuine respect for all who come here - past, present and future. We know and fulfil our role as kaitiaki of this maunga.

WHAT WE BELIEVE IN



Keeping it real



We're all in this together



We are the guardians



Fun is good



Making it gold

RISK LENS

Capacity

Most of Cardrona's detractors list capacity (lifts, cafes, carparks, road) as the biggest inhibitor to recommending us to a friend.

Guest expectations

Guest expectations are constantly evolving, especially when comparing with other holiday destinations.

Global threat

With aggressive moves from EPIC and Ikon.

Competition

It is a race to see who will be first to deliver on the terrain and lift network, step change to become a super resort.

Social license

Community has divided with feelings around over-growth and tourism. Infrastructure is constrained. A segment of the community views growth as a social, environmental and even economic negative impact.

Climate change

Snowline receding , warmer temperatures and more extreme weather events



SUSTAINABILITY LENS

Community wellbeing

Community inclusion, collaboration and communication on all future developments.

Community focused and inclusive foundation projects.

Quality employment

Opportunities for permanent employment with living wage.

Create a place that is a way to live a great life and become the best person they can be.

Maintain capability for high quality and safe experiences.



Climate change

Priority Set 1 – Eliminate or offset all fuel CO2 emissions.

Priority Set 2 – Reduce secondary GHG via waste management, procurement, product design and guest education

Consumption and waste

Phase 1: Minimising waste.

Phase 2: Minimising the impact of consumption.

Our natural environment

Phase 1: Simple Models – continue to provide direct support to ecological restorative initiatives.

Phase 2: Integrated models – adapt and develop products so that ecological restoration is a direct outcome of the customer experience.

Climate change

For the June to September season the ski areas, the mid-range estimate temperature projections are an expected increase of about 0.5 °C by 2030, and 1°C by 2040. Owing to the different possible pathways for the concentrations of greenhouse gases in the atmosphere and the differences in climate modelling, the projections for warming span a range: 0.8–1.1°C by 2040 with the upper range of 1.5°C, and 2-3°C by 2090. (Jim Sallinger Jan 2021 – full report attached).

The base of Treble Cone is 1260 m asl. Our snowmaking days are general between – 1.5°C max and down to -10°C at the base, with an average temp of -4°C. Even in 2090 we will still be able to make snow at this altitude. In addition, we have the expectations that there will be further technology improvements in snowmaking (<https://cordis.europa.eu/article/id/361000-new-technology-lets-ski-resorts-produce-snow-in-abovefreezing-temperatures>). CARL will continue to invest in new snowmaking technology, with the snow factory able to make snow at +20° C as an option for the lower mountain .

When applying mid-range precipitation projections, seasonal snow depths increase by 3% by 2030 and 5 to 9% by 2040. Under these circumstances, the ski field operations are viable for at least the next two decades. More risk is posed by year-to-year variability in snow precipitation. Only with more warming (2 to 3°C) do snow depths decrease, from 14% (RCP 6.0), and 31% (RCP8.5) by 2090. (Jim Sallinger Jan 2021 – full report attached).

Hence we are expecting higher precipitation for the next few decades promising us large amounts of snowfall.

Refer to attached report: Past, present and future seasonal snow for Cardrona and Treble Cone ski areas – Dr Jim Salinger 18/01/2021

Climate change

Primary actions for 2020 - 2050

Continual investment in technology that integrates with increasing temperature and taking advantage of increased precipitation

- Snowmaking improvements. Snowmaking equipment is improving yearly by making better quality of snow at higher temperatures. Currently we can make snow at -1.5°C and below (depending on wet bulb). 5 years ago we needed much lower temperatures to make snow. *See next page for further information.*
- The Snow factory for lower mountain to base (1260m asl). To keep the lower mountain to base trails open we will look towards snow factory technology which makes snow up to +20°C.

Carbon zero objective

- Collaborative work within the ski industry to align and measure carbon emissions is currently being actioned and led by CARL. This will lead to a new carbon zero target, with the goal to bring this forward from 2050 and show leadership across New Zealand from an industry which is being impacted by climate change.

Secondary action for 2050 onwards

- We will start planning lift access from the base facility (1260masl) directly to the saddle basin (1960masl) with downloading capability. This will mean greater upper mountain usage where snowline will stay secure for a much longer period of time.

Long term actions

- Our plan is around diversification of alpine activities. At Treble Cone the current thinking is around developing a iconic food and beverage offering year round, a venue (e.g. weddings) with an epic view and the development of accessible day walks from the top of the 6 seater chair lift.

Climate change

Technology information

- **Traditional Snowmaking** using fan guns and lances, has developed significantly over the last 15-20 years which has seen the start up temperatures for snowmaking systems change from -3.5°C to -1.5°C . This 2°C improvement in marginal temperature performance is largely due to continual improvement in the nucleation process.
- In addition, the time needed to produce the required snow on trail has dramatically reduced through the use of larger snow producers and better snow management technologies such as **SnowSAT** snow depth monitoring. A typical design for a snowmaking system 20 years ago would require 500 hours + of snowmaking to achieve the results we do today, with designs based on 80 – 150 hours of snowmaking.
- The use of larger capacity systems allows snowmakers to capitalise on the available cold temperature windows and flow more water, when conditions are the most efficient to create snow. Technology improvements in water and air management have seen new snow producers now producing 30% more snow with the same energy input compared to 15 years ago.
- There are still areas of opportunity with current technology, such as further cooling of the water, and Technoalpin are continually looking to the future by spending \$10M+ annually on R&D into new technology such as improved control systems and weather forecasting. It is likely that non traditional snowmaking methods such as snow factories that will produce snow in any temperature will play a bigger part in managing the lower altitude slopes more and more into the future.
- **The Snowfactory** uses an innovative refrigerating technology to produce snow. An efficient heat exchanger cools the water down to freezing point without chemical additives, and enables snow production in a closed circuit no matter what the outside temperature. The snow is made exclusively of water. The consistency and high volumes of the snow make it last longer despite warmer ambient temperatures. (See brochure attached)
- **Snow farming** and **snow storage** are also likely to form part of the strategy going forward, using snow fences to capture wind blown snow, and using groomers to shift snow to where it is required. The use of insulated snow covers to store snow from one season to the next, is being used in Europe and is being trailed in NZ. (see brochure attached)

Snow factory and snow and ice protection information attached to offer information on managing snow in extreme warm conditions.