

# SUSTAINABLE SLOPES 2018 ANNUAL REPORT



NATIONAL  
SKI AREAS  
ASSOCIATION



NSAA

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# Acknowledgements

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NSAA recognizes the following participants in the Climate Challenge. Their leadership paves the way for others to inventory, target and reduce their carbon footprints:

NSAA invites all ski areas to consider joining the Climate Challenge. For more information, visit [www.nsaa.org](http://www.nsaa.org) and click on Environment.

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|--|--|---|
| <ul style="list-style-type: none"> <li>• Alpine Meadows*</li> <li>• Alta Ski Area</li> <li>• Arapahoe Basin</li> <li>• Aspen Highlands</li> <li>• Aspen Mountain</li> <li>• <i>Bear Valley</i></li> <li>• Beaver Valley Ski Club</li> <li>• <i>Blue Mountain, PA</i></li> <li>• <i>Blue Mountain, Canada</i></li> <li>• Boreal Mountain Resort</li> <li>• Bridger Bowl*</li> <li>• Buttermilk</li> <li>• Copper</li> <li>• Crystal Mountain</li> <li>• Deer Valley*</li> <li>• Eldora Mountain Resort</li> <li>• Giants Ridge Golf &amp; Ski Resort</li> </ul> | <ul style="list-style-type: none"> <li>• Gorgoza Park*</li> <li>• Grand Targhee</li> <li>• Granite Peak*</li> <li>• Hunter Mountain*</li> <li>• Jackson Hole Mountain Resort</li> <li>• Jiminy Peak</li> <li>• June Mountain</li> <li>• Killington Resort</li> <li>• Lee Canyon*</li> <li>• Lutsen Mountains</li> <li>• Mammoth</li> <li>• Mt. Bachelor</li> <li>• Mt. Hood Meadows Ski Resort</li> <li>• Pico Mountain</li> <li>• Snowbird</li> <li>• Snowmass</li> <li>• <i>Snowshoe Resort</i></li> <li>• <i>Solitude</i></li> <li>• Soda Springs</li> <li>• Squaw Valley*</li> </ul> | <ul style="list-style-type: none"> <li>• Steamboat</li> <li>• Stratton</li> <li>• Sugarbush Resort</li> <li>• Taos Ski Valley</li> <li>• Telluride Ski &amp; Golf Resort</li> <li>• Timberline Lodge &amp; Ski Area</li> <li>• Tremblant</li> <li>• Wachusett Mountain</li> <li>• Winter Park*</li> </ul> |
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\*Resorts that supported the Climate Challenge but did not submit complete greenhouse gas inventories for the 2017-2018 season.

Italicized = New Challenger in 2018

## 2018 Highlights

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The National Ski Areas Association (NSAA) is pleased to report on the sustainability efforts of ski resorts in the 2017/2018 season. In its eighteenth year, the Sustainable Slopes program continues to progress in incorporating new initiatives and evolving to reflect emerging trends. In total, almost 200 resorts have endorsed the Environmental Charter over the past 17 years, representing over 75 percent of the ski resorts nationally by skier visits. Through their endorsement of the Charter, these resorts have identified an environmental contact person, assessed their policies and operations against the Environmental Principles in the Charter, and have taken steps toward improved environmental performance. NSAA would like to thank the Chair of the NSAA Environmental Committee, David Perry, for his leadership on sustainability and climate change over the past year.

NSAA surveys its member resorts on annually on sustainability efforts. In 2017, 312 responding resorts reported:

- 76% have water conservation measures in place, with 42% saving 100K gallons or more annually;
- 81% have energy efficiency measures in place, with 19% saving 500K kWh/yr or more annually;
- 52% are supporting renewable energy in some way (through on site generation, purchases, educating guests, etc.);
- 88% have waste reduction and recycling programs in place, with 26% diverting 20% or more of their waste from a landfill.

The **Climate Challenge** continues to grow with 6 additional resorts joining for the season ahead: Bear Valley Mountain (CA), Blue Mountain Resort (PA), Blue Mountain (Canada), Snowshoe Mountain (WV), Solitude Mountain Resort (UT), and Wachusett Mountain (MA). The Climate Challenge program provides technical support and a public reporting platform for NSAA members that are developing carbon inventories, setting goals for carbon reduction, and measuring success in reducing their overall carbon footprint. These ski areas are leading the ski industry by addressing climate change head on – taking action and making changes in their operations that will reduce their impacts on the climate, while advocating for climate change policies at the local, state and national levels. In-depth results of the Climate Challenge are included in Chapter 3 of this Report.

A number of ski areas participated in unique advocacy opportunities this past year (see We Are Still In and CCL Initiative below) including writing letters to their congressional delegations urging them to join the **Bipartisan Climate Solutions Caucus**. Two Congressmen from Florida launched the caucus (Rep. Carlos Curbelo (R-FL) and Rep. Ted Deutch (D-FL)) to "explore policy options that address the impacts, causes, and challenges of our changing climate," and to seek "economically-viable options to reduce climate risk and protect our nation's economy." The caucus requires members to join in bipartisan pairs to emphasize the need for a bipartisan approach to solving climate. Accordingly, ski areas chose a Republican and Democrat Representative that they thought would pair up nicely, and invited them to join the caucus "Noah's ark style" for the benefit of their state. The caucus has grown significantly over the past year and could play a pivotal role in building bipartisan support for climate policy in the House.

In July of 2018 Rep. Curbelo introduced carbon tax legislation in Congress, the "Market Choice Act," that would eliminate the current federal gasoline tax (which consumers pay at the pump) and put a price on the

carbon content of imported and domestically produced fossil fuels (oil, coal, and gas), starting in 2020. Certain industries that produce carbon emissions outside of energy production (like cement, aluminum and steel manufacturing) would also be assessed a fee for the carbon content of their emissions under the bill. This bill is the first Republican sponsored climate legislation since 2010 and is a great first step in sparking dialogue on broad scale climate solutions and placing a price on carbon. NSAA circulated a sample [thank you letter](#) to Rep. Curbelo to recognize the importance of this proposed legislation and the role that he plays on the Climate Solutions Caucus.

## WE ARE STILL IN

Many ski areas, including Climate Challengers, endorsed the We Are Still In open letter to the international community and parties to the Paris Climate Agreement signed by thousands of businesses across the country along with state and local governments and universities as well. Endorsers stated that in the absence of Washington leadership, they are joining forces for the first time to declare continued support for climate action to meet the Paris Agreement. In anticipation of the [San Francisco Global Climate Action Summit](#), signatories were encouraged to share their progress on carbon reductions with the forum to help aggregate the total impact that voluntary actions have had on keeping the U.S. on a path to meet the Paris Agreement requirements.



**Citizens' Climate Lobby**  
**Citizens' Climate Education**



NSAA and a number of ski areas are working with Citizens' Climate Lobby (CCL) on advocating for a price on carbon as a solution to climate change. CCL formed a "Ski and Outdoor Industry Action Team" that focuses on building relationships throughout the ski and outdoor industry to develop a network of support for a market-based climate solution that is effective in bringing about the emissions reductions needed to solve the problem of climate change. NSAA, Alta, Aspen, CSCUSA, Snowbird, Deer Valley, Solitude, Mount Hood Meadows, Copper, Bridger Bowl, Stevens Pass, Jiminy Peak, Lutsen Mountains, Telluride, Crystal Mountain (MI), POW, and a number of Olympic and professional athletes have signed on to CCL's carbon pricing advocacy efforts. For more information on CCL, visit <http://citizensclimatelobby.org/>.

NSAA hosted education sessions at our Eastern and Western Winter Shows in 2018 on the important topic of "Partnering with Climate and Sustainability Partners" to raise awareness and highlight for ski areas all of the great programs and partnering options that exist for climate change solutions and improving sustainability. While we view the Climate Challenge as a top notch program for climate solutions, we recognize that resorts are partnering with a host of different organizations for third party certification, carbon inventories, and reporting platforms. A comprehensive [spreadsheet](#) of all of the options for climate and sustainability partnering was one of the many take-aways from these Winter education sessions.

NSAA hosted a session at our National Convention in May called “Leveraging your Power for Climate Solutions.” The session was led by Navigant’s Matt Banks and highlighted examples of ski areas working with their utilities to decarbonize the grid. Promising work is being done by Challengers intervening in state public utility commission and Utility Consumer Participation Board proceedings to green the grid on a broader level. Influencing public commissions in this way to shape the state’s electric resource plan and switch from coal plants to wind and energy sources can have far reaching impacts beyond the resort community. [Click here](#) for more information.

We are also pleased to report on the continued success of our Sustainable Slopes Grant Program. Four resorts received grants in 2018: **Blue Mountain**, Penn. (LED and motion controlled night lighting), **POWDR**, Utah (Brendle Group Sustainability Staffing consulting services), **Mountain High**, Calif. (HKD snowmaking equipment); and **Snow Creek**, Missouri (Ultra-Tech night lighting). Since its inception in 2009, the Sustainable Slopes Grant Program has awarded \$128,500 in cash grants and \$394,000 in in-kind grants, for a total of **\$523,000** in support of resort sustainability projects. NSAA thanks our sponsors, Brendle Group, CLIF Bar, HKD Snowmakers and Ultra-Tech Lighting for their generous support of the program. View the [Grant Program Press Release](#) for more detailed information on the grant winners.

In total, the **SWAG** program, or **Sharing Warmth Around the Globe**, has donated over 278,000 winter garments to people in several overseas countries that desperately need warm clothing to wear during the cold winter months. In 2017/2018, SWAG partnered with HELP International and Precept Ministries International and with the help of 30 resorts, collected and distributed more than 13,000 pieces to individuals in several Eastern European countries. Information regarding the 2018/2019 program will be distributed shortly and collection will begin in October.

*SKI* Magazine announced four winners of the **Golden Eagle Awards for Environmental Excellence** in 2018. The 25<sup>th</sup> Anniversary of the awards was celebrated at NSAA’s National Convention at Marco Island. *SKI* founded the program in 1993 to encourage sustainability and to recognize resorts for their commitment to the environment, and ski areas have come a long way in the past 25 years. **Bear Valley**, Calif. earned the Innovation in Sustainability Award, **Boreal Mountain**, Calif. was honored with the Golden Eagle Award for Overall Environmental Excellence, and **Crystal Mountain**, Mich. won the Climate Change Impact Award. In addition, *SKI* named Sha Miklas of Arapahoe Basin Ski Area in Colorado as the Hero of Sustainability honoree for 2018. View the [2018 press release](#) on the awards for more detailed information.



*SKI's Andy Hawk with 2018 Hero of Sustainability, Sha Miklas (Arapahoe Basin)*

On behalf of ski areas across the country, NSAA would like to express our appreciation for all of the individuals, organizations, and agencies outside the industry that have supported Sustainable Slopes for the past eighteen years. We are grateful for the resort leaders, partners and stakeholders who have contributed to our collective successes.

Geraldine Link  
Director of Public Policy  
September 2018



# 1. Sustainable Slopes Environmental Charter

## 1.1 History and Purpose of the Charter

Every year, millions of people visit ski areas across North America to enjoy snow sports and to experience the natural beauty of the mountain environment. These visitors place a high priority on environmental concerns. In order to continue to offer quality recreational experiences that complement the natural and aesthetic qualities that draw these visitors to the mountains, the National Ski Area Association (NSAA) and its member resorts have committed to improving environmental performance in ski area operations and management. This commitment is detailed in the Sustainable Slopes Environmental Charter for Ski Areas adopted in June 2000 and revised in 2006.

To see the Charter and its Principles in their entirety, visit the NSAA web site at [WWW.NSAA.ORG](http://WWW.NSAA.ORG)

## 1.2 Overview of the Environmental Charter

The Environmental Charter promotes sound environmental stewardship and, more importantly, offers a comprehensive set of [21 Environmental Principles](#) that enable ski area operators to raise the bar on environmental performance. The Principles are the key to the Environmental Charter and address a wide variety of topics relating to natural resource management.

[Click here](#) for a list of endorsing resorts sorted by resort name or State/Province location. Over 70 of the endorsing ski areas contributed to the information presented in this report by submitting Sustainable Slopes Grant Applications, Climate Challenge Applications and Renewals, and Golden Eagle Award Applications.

## 1.3 The Future

NSAA will be updating the Sustainable Slopes Program over the next year. We will also continue with the Grant Program and Climate Challenge, and look for ways for the two programs to be complementary. The Climate Challenge is critically important for the ski industry given lack of leadership on climate solutions in Washington. The Grant Program has and will continue to spark innovation among resorts and allow resorts with fewer resources to take on sustainability projects that might not otherwise happen. It also is a great vehicle for funding Climate Challenge resorts' projects that help them meet their carbon reduction targets. An ongoing goal is to increase participation in the Grant Program as well as the Climate Challenge.

As Sustainable Slopes matures, the nature of its goals continually changes to meet the needs and expectations of member resorts and Partnering Organizations. NSAA hopes to create sources of new momentum for the program and to recognize ever higher levels of performance while continuing to encourage broad participation and efforts across the industry.

## 2. Sustainable Slopes Grants

### 2.1 Background

NSAA began a modest grant program in 2009 as a partnership between NSAA and industry stakeholders. In total, the program has directed over \$523,000 to 46 resort sustainability projects! The purpose of the Grant Program is to spark innovation and increase resorts' progress in implementing the Environmental Principles of the Charter by putting money on the ground. NSAA is always looking for additional sponsors for this grant program!

The purpose of the Sustainable Slopes Grant Program is to spark innovation and increase resorts' progress in implementing the Environmental Principles of the Charter.

### 2.2 Grant Awards

**Blue Mountain** received a cash grant to install LED and motion-controlled night lighting in its parking areas that border the Appalachian Trail, an important national trail managed by the National Park Service. The new lighting project will improve safety for guests and employees, reduce the lighting impact on the Appalachian Trail through controlled and sharp lighting cut-offs and rapid dimming, reduce the resort's carbon emissions, and educate guests and employees through informative signage. Blue Mountain is joining the ski industry's Climate Challenge this season, and the lighting project will help the ski area meet its goals for carbon reduction (see Chapter 3 for Climate Challenge information). Blue Mountain's \$5,000 grant was made possible by a generous donation from **Clif Bar & Company**, based in Emeryville, Calif. Clif Bar has contributed to the Sustainable Slopes Grant Program for nine years running.



Massachusetts-based [HKD Snowmakers](#) awarded a high-efficiency snowmaking grant to Mountain High. The ski area will receive five high-efficiency snowmaking guns from HKD Snowmakers, a total value of \$23,000. **Mountain High** will use this grant to help continue its efforts to reduce diesel fuel and electricity consumption associated with snowmaking. Mountain High has snowmaking on more than 80 acres of terrain with runs about 200 feet wide. Low-energy snowmaking equipment will decrease the ski area's compressed air consumption, save power, and reduce the ski area's carbon footprint. Mountain High estimates that the new HKD equipment will help the resort save \$4,000 per acre foot of snow.

[Ultra-Tech Lighting's](#) in-kind grant of 10 Snow-Bright™ light fixtures went to Snow Creek. The ski area will install the 10 fixtures to replace existing Metal Halide fixtures and cover a great deal of its beginner area, as night skiing is a staple for Midwest resorts. The value of the grant is \$7,000. Snow-Bright™ is energy-efficient lighting that will result in savings up to 85 percent over conventional lighting in operating electricity. Snow-Bright™ also substantially reduces "in-rush" current associated with electricity demand charges, which can shave enormous amounts off of total energy bills.

POWDR is receiving the benefits of an in-kind Sustainability Staffing consulting services grant valued at \$5,000. [Brendle Group](#), the sustainability engineering and planning firm that manages the Climate Challenge, will work with POWDR to assess the important intersection of HR and sustainability. POWDR recognizes the importance of building an internal structure that supports the actions the resorts must take to ensure we play forever, and the adventure lifestyle company is ready to build on the momentum that the past 10 years of commitment to operational sustainability has created.

Thanks to our Grant Program Sponsors!



## 3. The Climate Challenge Program

### 3.1 Introduction

This year marked the **seventh year of the Climate Challenge**, a voluntary program designed to support and recognize ski areas that are committed to reducing their climate impact. Challengers do this by inventorying and reporting on their carbon footprints, setting goals for carbon reduction, implementing at least one on-site carbon reduction strategy per year, and engaging in climate change advocacy efforts.

Each year the Climate Challenge program seeks to build upon its successes to improve the operations of existing participants while adding new members. To this end, the program welcomed four new Challengers during the 2017-18 season: Bridger Bowl Ski Area (MT), Eldora Mountain Resort (CO), Mont Tremblant (Quebec), and Winter Park (CO).

Looking to next year, the ski areas joining the Climate Challenge for the 2018-19 season are Bear Valley Mountain, CA, Blue Mountain, ON., Blue Mountain, PA., Snowshoe Mountain, WV, Solitude, UT, and Wachusett Mountain, MA.

#### Why the Climate Challenge?

Climate change presents challenges to the ski industry that require proactive planning, action, and bold leadership. The Climate Challenge provides a framework for participants to engage in a multi-year process that enables them to plan and implement actions that will reduce emissions, share those successes industry wide, and collaborate with others in the industry to leverage the collective power of working together on climate issues.

#### GOALS OF THE CLIMATE CHALLENGE

- **Higher standard:** The program will raise the standard for ski areas wishing to take their sustainability performance to the next level.
- **Long-term:** The program will be multi-year, seeking to compound the benefits of actions taken by participants over many years and to grow the number of participants from year to year.
- **Cost-efficient:** The program will leverage the investment of participants and sponsorships to deliver more value to participants than their individual investments.
- **Credible:** Quantification of greenhouse gas inventories, targets, and reduction measures will be developed in alignment with a credible protocol, using boundaries consistent with industry approaches.
- **Transparent:** The approach taken by the program will be transparent to participating ski areas and the public.
- **Fair:** The program will be fair, facilitating participation for ski areas of all sizes, regions, and focuses.
- **Easy:** The program will provide participating ski areas with guidance and tools to make participation as simple as possible.

### Challenge Elements

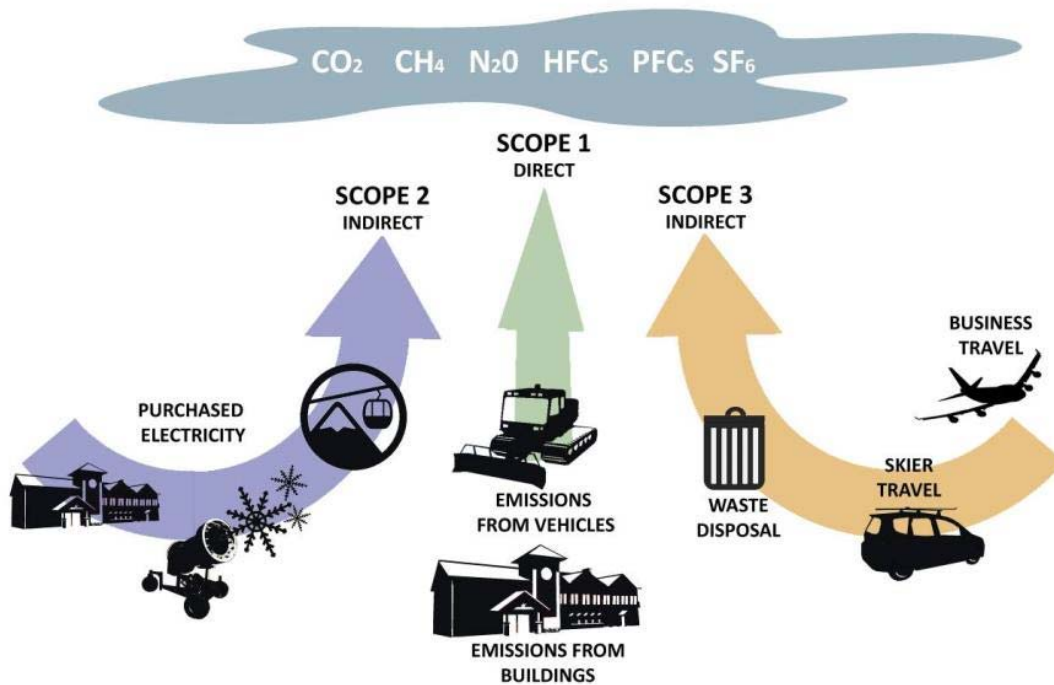
Ski areas participating in the Challenge commit to a five-step process each year.



### Inventory

In order to understand the impact of their operations, Challengers inventory greenhouse gas (GHG) emissions for their ski area operations. Inventories are required to include direct emissions at the ski area (Scope 1) and indirect emissions from purchasing energy, such as electricity (Scope 2). Other emissions, such as those from waste disposal or business travel, can be included at the discretion of the Challenger. The Challenger can choose to inventory emissions for the fiscal or calendar year.

For 2017/2018, Challengers prepared inventories using a tool that follows the guidelines of The Climate Registry's General Reporting Protocol.<sup>1</sup>



<sup>1</sup> "General Reporting Protocol." The Climate Registry, n.d. Web. 23 May 2017. <<https://www.theclimateregistry.org/tools-resources/reporting-protocols/general-reporting-protocol/>>.

## Target

With an understanding of the emissions generated by their operations, Challengers define a target (or goal) for reducing emissions. The structure of the target is flexible: the Challenger can select which emissions to reduce, how much they will be reduced, and over what time period the target will be achieved. Regardless of the structure of the target, Challengers define a target that will reduce GHG emissions relative to an established baseline GHG inventory for ski area operations. A number of Challengers have already achieved their targets or their target date is approaching soon; as a result, a number of ski areas are in the process of establishing new targets and commitment periods.



Targets are the means for measuring Challenger progress and hopefully will become useful planning tools as Challengers make operational decisions in years to come.

### THE LANGUAGE OF CARBON

**Carbon Dioxide (CO<sub>2</sub>):** The major heat-trapping gas whose concentration is being increased by human activities. It also serves as the yardstick for all other GHGs. The major source of CO<sub>2</sub> emissions is fossil fuel combustion. Carbon dioxide emissions also result from clearing forests and burning biomass. Atmospheric concentrations of CO<sub>2</sub> have been increasing at a rate of about 0.5 percent a year, and are now more than 30 percent above pre-industrial levels.

**CO<sub>2</sub>e:** Carbon dioxide equivalent, a measure that is used to express the concentration of all heat trapping gases in terms of CO<sub>2</sub>.

**MTCO<sub>2</sub>e:** A metric ton of CO<sub>2</sub>e. A metric ton is equivalent to 1.102 short tons or 2,204 pounds.

## Reduce

Challengers commit to take one measurable step to reducing their GHG emissions each year in order to progress toward their target. Examples of reduction projects include increased energy efficiency in buildings, lifts, and snowmaking; switching to more efficient fleet vehicles; increasing diversion of solid waste to reuse; recycling or composting; or installing a renewable energy system on-site.

The Climate Challenge views purchasing a renewable energy credit (REC) or a carbon offset as a means of contractually demonstrating an emission reduction. These instruments may be used by Challengers to achieve targets, but are not recognized for the Reduce component of the Challenge. In other words, at least one reduction project must occur on-site each Challenge year.

Outsourcing or divesting emission sources is not allowed as a reduction strategy for those participating in the Challenge. For example, outsourcing a restaurant to a concessionaire during the Challenge will not be considered a reduction in emissions from a baseline that includes the restaurant.

### Advocate

Advocacy is a core component to the Challenge's overall goal. The advocacy element of the Challenge helps communicate important efforts made by the ski industry to leaders and legislators on a national level, and supports regional or national legislation or regulation targeting climate issues. Members are required to engage in advocacy activities, such as endorsing energy/climate change advocacy letters. This often includes sending correspondence from the resort to its Congressional delegation on the resort's efforts or initiatives, and the ski industry's efforts on the Climate Challenge. Additional advocacy options include engaging in climate advocacy at the state level, writing an editorial about climate change, and attending a climate advocacy-related event with NSAA.

### Report

Having completed the first four activities in the Challenge, Challengers report a summary of their results to the Climate Challenge program and the public. The summary includes the following elements:

- Total GHG emissions in MTCO<sub>2e</sub>
- Stated reduction target
- A narrative description of reduction activities
- Documentation of advocacy requirements

Challengers are asked to be complete and accurate in reporting to the Challenge. The goals of the Challenge are larger than a single ski area and are best served when all participating ski areas make their best effort. To this end, all submitted inventories, targets, and reduction activities are reviewed by a third-party to ensure they are eligible and reasonable with respect to the program's standards and expectations.

### Program Support

To aid Climate Challengers with the program requirements, Brendle Group provides educational and technical support. In fall 2017, a kick-off seminar was held to introduce participants to the program requirements and to explain the features of the data collection tool and relevant updates for the season. One additional seminar was held to provide a deeper dive into the different program requirements and to foster increased collaboration among participating resorts.

Challengers are also welcome to email or call the Climate Challenge team to troubleshoot the tool, gain feedback on target setting, or brainstorm reduction projects. An annual program guide and newsletter were sent to Challengers for expansive program details and more helpful hints on how to maximize program success.

### Encouraged Elements

In addition to the four program requirements, Challengers are encouraged to undertake a number of activities to reduce emissions in indirect ways that may not be reflected in their inventories but may still have a significant impact on global emissions. These activities are recognized and supported by the Climate Challenge. Some examples of these indirect activities are described here:

- Adaptation – A new adaptation toolkit was added to the Climate Challenge’s offerings. This new toolkit provides resources and a planning framework that can help resorts enhance their climate resilience.
- Tackling Waste – A number of resorts have made strides in reducing their waste by improving and investing in recycling programs and working to limit the use of disposable goods such as single-use water bottles.
- Educational Events – Many resorts host events that are focused on environmental education with topics covering climate change and more. For one resort, educational events took the form of training for resort management to help make sustainability a bigger part of all operations.
- Water Efficiency – In addition to energy efficiency many resorts are taking steps to improve their water footprint often through upgraded snowmaking equipment. One resort is even using 100% recycled water for snowmaking.
- Transportation Programs – Skier and employee transit continues to be an area of emphasis for resorts with many are investing in infrastructure, providing incentives, and educating their skiers and riders to reduce single-occupant vehicle travel to ski areas and enable electric vehicle transportation.



### 3.2 Challenge Results

The following sections present the outcomes of the inventory, target, reduce, and advocate process for this year’s Climate Challengers. The Challengers represent a variety of ski area sizes, regions, and operational characteristics. In addition, the carbon intensity of the electricity they purchase varies widely. In other words, ski areas are all unique; however, they all have committed to reducing their GHG impact.

In 2017/18, Scope 1 and 2 emissions totaled 167,251 MTCO<sub>2</sub>e for all Challengers that reported complete GHG inventories. Reporting resorts implemented on-site projects that reduced emissions by 1,509 MTCO<sub>2</sub>e and reported REC purchases equivalent to 593 MTCO<sub>2</sub>e. The cumulative impact of on-site projects since 2011 (which accrue annual reductions for the life of the project) totals 60,729 MTCO<sub>2</sub>e reduction. The cumulative total of all REC purchases since 2011 is 191,440 MTCO<sub>2</sub>e. Together, the cumulative impact of all on-site projects plus REC purchases since 2011 is 252,169 MTCO<sub>2</sub>e. This reduction is the equivalent of over 37,700 homes’ electricity for a year, or the carbon sequestered by 6.5 million tree seedlings grown for 10 years.

The number of Challengers continues to increase each year and the Climate Challenge is excited to see how increased reporting support can help show reductions in average total emissions and increases in average project reductions. However, this year did present difficulties for the program in terms of data availability and timeliness of reporting for some resorts – issues that we hope to resolve in future seasons through improved training, support, and communication.

The table below provides an overview of the progress ski areas have been making towards reducing greenhouse gas emissions during the six years of the Climate Challenge. Note that the results do not include those resorts that were unable to submit complete greenhouse gas inventories for the 2017-2018 season: Alpine Meadows, Bridger Bowl, Deer Valley, Granite Peak, Hunter Mountain, Gorgoza Park, Lee Canyon, Squaw Valley, and Winter Park.

Reporting Year	Challengers**	Total Scope 1&2 Emissions*	Average Scope 1&2 Emissions*	Emissions Reductions Per Year*	Average Emissions Reductions*	RECs Purchased*
2011	8	65,131	8,141	172	22	2,134
2012	17	106,934	6,290	3,694	217	33,346
2013	17	103,398	6,082	1,130	66	41,819
2014	27	168,584	6,244	2,147	80	41,944
2015	28	192,055	6,646	5,588	200	38,580
2016	30	204,477	6,816	2,424	81	33,024
2017	24	167,251	6,969	1,509	63	18,678

\*Reported in MTCO<sub>2</sub>e, \*\*Challengers that submitted completed inventories

Since 2011, average Scope 1 and 2 emissions have decreased by 7 percent. The average project reductions per ski area see a large amount of fluctuation from year to year but have consistently remained well above their 2011 starting point. When reported in MTCO<sub>2e</sub>, RECs have seen a large decrease since 2014. However, much of this decrease is due to improvements in the electricity generation mix, each kWh purchased as a REC represents a smaller amount of carbon than it did four years ago.

Trends emerge when looking at the types of reduction projects that Challengers completed. Lighting upgrades continued to be hugely popular this year. Multiple resorts also completed projects focused on snowmaking efficiency upgrades, replacing older snowcats with more efficient models, and improving insulation.

Challengers were also tasked with advocating for climate change or energy policies during the 2017-18 season. They accomplished this requirement in a variety of ways, which included:

- Sending direct correspondence to their Congressional delegation regarding climate change legislation.
- Endorsing the Carbon Pricing Principles through the Citizens' Climate Lobby.
- Getting active in support of local community and municipality climate initiatives.

The remainder of this section provides the results for individual participating ski resorts in alphabetical order.



## Alta Ski Area – Utah

INVENTORY FY 2016	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	5,080	Alta Ski Area will reduce emissions by 20 percent under 2010-11 levels by 2020-21.
Scope 3 (Solid Waste)	279	
<b>Total</b>	5360*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Alta Ski Area added some Alerton system detections and updated lighting systems.

### Other Progress

Alta Ski Area seeks to be a leader in land conservation, not just because we live in a protected watershed and National Forest, but because we care, we are stewards, and we believe in making the mountains around Alta a better place. It takes a lot of people to get things done, this was our lineup of stats for the summer of 2016.

#### Stewardship:

- 23 individual volunteer events
- 463 volunteers
- 2,154 hours of hard work
- 1,630 native flowers planted
- 2,000 native trees planted

#### Environmental Education:

- 14 individual education events (including Alta Kid's Day focusing on environmental education)
- 837 participants
- 2,636 hours of education



## Arapahoe Basin Ski Area – Colorado

INVENTORY FY 2017	MTCO <sub>2e</sub>	TARGET
<b>Scope 1 &amp; 2 (Req)</b>	3,591	Arapahoe Basin Ski Area will reduce emissions by 3 percent under 2009-10 levels by 2019-20.
<b>Scope 3 (Solid Waste)</b>	99	
<b>Total</b>	3,690*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Arapahoe Basin underwent a building energy automation and controls project at mid-mountain lodge which has led to an 83 MTCO<sub>2e</sub> reduction

### Other Progress

In addition to these yearly sustainability projects, Arapahoe Basin is constantly striving to reduce greenhouse gas emissions in any way we can. There are a number of programs we undertake at the mountain to further this goal through education, policy, and planning.

One such program is our carpooling initiative for both employees and guests. Arapahoe Basin is privileged to have service to and from the mountain by the Summit Stage, a free bus system that links most ski areas and major destinations within Summit County. Guests are encouraged to ride the bus or carpool with a number of incentives, including significantly discounted lift tickets and reserved parking spaces in prime locations closest to our chairlifts and base lodge. Employees are also encouraged to ride the bus or car pool every day of the year. However, carpooling is made mandatory for employees on weekends during the spring months. In addition to the free bus and encouraging employees to bring three or more people per car, the Basin also runs shuttles from employee housing and a few other central locations on these days. These efforts save on parking stresses, as well as limiting the number of cars on the road, gallons of gas burned, and any associated emissions.

Another step Arapahoe Basin is taking to further our sustainability message and goals is partnership with a number of local nonprofits and conservation groups. Arapahoe Basin's Employee Environmental Fund benefits two conservation groups, Friends of the Eagle's Nest Wilderness and the Continental Divide Land Trust, with more than \$2,000 donated each year. Employees have the option to donate \$1 or more from each paycheck, which The Basin matches and splits between the two groups. We also work very closely with our local conservation center, High Country Conservation, which provides the community with sustainability solutions from composting tips and energy audits to sustainability curriculums in local schools. Every year in the spring we host the Save Our Snow event as a fundraiser benefitting the conservation center. The event brings many of our partners and local companies together to highlight sustainability, and between the sale of raffle tickets and a portion of each lift ticket, raises quite a bit of money to help with their programming.

In addition to our fundraising efforts, carpool incentives and projects, Arapahoe Basin has also integrated sustainability into all of our training and orientation materials and built environmental awareness into every department's daily activities. There is a no-idling policy in place for all company vehicles, as well as for guests. There are even sustainability purchasing guidelines that empower purchasers to make responsible decisions, even at the cost of the company. All of these efforts and more combine to make Arapahoe Basin as sustainable as it can be despite the often resource and energy intensive nature of our business. We know we aren't perfect yet, but we feel that every effort, no matter how small, is a step in the right direction. Arapahoe Basin is committed to walking lighter on the planet, even in our ski (and snowboard) boots!



## Aspen Skiing Company – Colorado

INVENTORY CY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	21,221	Aspen, Aspen Highlands, Buttermilk, Snowmass plus all ancillary operations will reduce emissions by 18 percent under 2014 levels by 2020.
Scope 3 (Solid Waste)	20	
Total	21,241*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Aspen Skiing Company continues to implement lighting retrofit projects in the: BM shops, Divide Shop, 407, Timbermill, Aspen Highlands Building 7, SM Ops and F&B Locker Room, Riverside planning office and at Sopris View. Additionally, Aspen has converted the Riverside Boilers from non-condensing to condensing units, which has saved over 4,300 therms of natural gas and have installed car chargers at 117, Riverside and with TOSV.

### Other Progress

Check out the links below to learn more about Aspen’s sustainability initiatives.

- Aspen Way campaign: <https://www.aspensnowmass.com/inside-aspen-snowmass/the-aspen-way>
  - <https://www.aspensnowmass.com/-/media/aspensnowmass/pdfs/environmental/ascpowintrawestschendleranswertestimonyfinal.ashx?la=en&hash=C38AE14665BF08892FD72A5228DACFOFF725335A>
  - <https://www.aspensnowmass.com/we-are-different/take-action>
  - <https://www.aspensnowmass.com/we-are-different/protect-our-winters>
  - <https://www.aspensnowmass.com/we-are-different/supporting-the-local-community>
  - <https://www.aspensnowmass.com/we-are-different/programs-and-practices>
- In our 21st year, The Environment Foundation has donated over \$3.4 million to more than 550 projects across the Roaring Fork Valley to protect the environment: <https://www.aspensnowmass.com/we-are-different/the-environment-foundation>.
- Also check out our green operations section for an ever growing list of our work: <https://www.aspensnowmass.com/we-are-different/programs-and-practices/green-operations>.
- We constantly update our followers via our Sustainability Facebook page: <https://www.facebook.com/groups/AspenSustainability/>.



Beaver Valley Ski Club – Ontario, Canada

INVENTORY FY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	428	Beaver Valley Ski Club will reduce emissions by 15 percent under 2011-12 levels by 2020-21.
Scope 3 (Solid Waste)	24	
Total	452*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

**Reduce**

Beaver Valley replaced four low efficiency air compressors with two high efficiency compressors.

**Other Progress**

Beaver Valley Ski Club has been a part of the NSAA's environmental programs since 2010. We have implemented many projects to reduce our greenhouse gas emissions and our impact on our piece of Ontario, Canada. Here is a summary of what we have done lately. We began adding insulation to the walls and ceilings of our main clubhouse, a project that is ongoing into this summer 2018. We have installed a wood-burning stove to replace baseboard electric heaters in our secondary clubhouse. We retired a diesel V8 pickup truck and added a V6 diesel shuttle to our fleet. The club replaced 4 inefficient air compressors with 2 high efficiency air compressors. This compressor upgrade gives us a 16% reduction in kWh consumption in our snowmaking operations. In 2011 BVSC set a reduction target to reduce 2011 baseline emissions by 6% by 2020 that we have since surpassed due to a change in the electricity mix of Ontario's power grid - the province closed 2 coal plants and increased nuclear capacity. So we have set a new reduction target to reduce our baseline emissions by 15% by 2020. Being one of the few Canadian resorts to be a part of the Climate Challenge (and the smallest), Beaver Valley is working to start a conversation with the rest of the snow resorts and the population around climate change and its impact on Canadian snow resorts. #beavervalleyvsclimatechange



## Boreal Mountain Resort & Soda Springs – California

INVENTORY FY 2016	MTCO <sub>2</sub> e	TARGET
Scope 1 & 2 (Req)	1,570	Boreal Ridge Corp. will reduce emissions by 25 percent under 2011 levels by 2020.
Scope 3 (Solid Waste)	78	
<b>Total</b>	1,650*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Boreal Ridge Corp. purchased two tier 4 snowcats and retired less efficient vehicles. Additionally, they performed a retrofit of their night lighting infrastructure.

### Other Progress

The California sun is a beautiful thing and at Boreal Mountain California, we can now do more than enjoy it while we partake in our adventure lifestyle activities; we are converting it to clean energy. In December of 2017, Boreal Mountain California went live with the Tahoe Solar at Boreal Mountain California project. We installed 715 solar panels on the roof of the Woodward Tahoe action sports facility, this 235kw photovoltaic system will produce 325,000kwh annually. The installation will offset more than 250 tons of carbon annually, the equivalent to removing 52 cars from the road. This rooftop array is the largest in the California ski industry and has set the bar for other industry leaders to follow. As this system is a rooftop array, there was zero ground disturbance in the construction. Visible from the highly travelled California Interstate 80, the Tahoe Solar Project is not only the largest installation in the California Ski Industry, but is the largest high altitude system in the country. We chose the identity of "Tahoe Solar at Boreal Mountain California," with the goal of social impact among the greater Tahoe region in hopes that awareness will inspire action from the action sports industry and community.

It's our responsibility to protect our natural resources and ensuring that we can enjoy winter sports for years to come. Boreal is committed to reducing carbon emissions produced through our operations. In addition to offsetting 100% of energy used through purchasing renewable energy credits, Boreal and Soda Springs resorts are actively finding solutions to reduce energy and water usage, influence behaviors that positively impact the environment, and to advocate for effective sustainable policy and regulation.

The Tahoe Solar Project sits proudly next to the Soda Springs Recycled Water Initiative in which the resort became the first resort in California to use 100% recycled water for snowmaking. These hallmark initiatives enable a renewable way to power a rapidly growing resort business. Both resorts have joined NSAA's Climate Challenge and continually set goals, measure the success each season and are proud to be honoring our commitments. These initiatives demonstrate that recreation and industry can grow alongside advancing our sustainability efforts; since 2008, we have reduced 790 tons of carbon annually.



Video showcasing this initiative can be seen through this link:  
[https://www.youtube.com/watch?v=sGZVV\\_u3C38](https://www.youtube.com/watch?v=sGZVV_u3C38)

This commitment to onsite creation of clean energy will offset annually 15% of our total company energy usage, 65% of our base area usage and Woodward Tahoe will be generating more power than it consumes on an annual basis. It is anticipated that during the months of April through September this system will generate more power than consumed at the resort base area. Our Climate Challenge target is to reduce emissions by 25% below 2011-2012 levels by 2020, this project achieves 66.4% of our goal. The upfront cost for this project was \$615,000 and we will benefit from a \$184,000 Federal Tax Credit, a State of California MACRS Depreciation Credit of \$50,000, and a Federal Depreciation Credit of \$157,000. The \$224,000 net payment has a 6.3 year return on investment, and over 30 years will have a 12.19% internal rate of return and a \$1,432,000 avoided utility cost. Youth = Power. Boreal and Woodward Tahoe are youth-centric brands with the opportunity to influence an impressionable audience. As part of the launch of the system, Boreal initiated a guest education initiative in which we share the benefits of our system as well as actions that can be taken by the guest to reduce energy usage. This is being rolled out through engagement on-site, on-line and through specific outreach channels such as the Burton Chill Foundation, Sierra Nevada College Sustainability program, employee communications and Woodward Tahoe youth programs. Beginning in February, we will be launching a content series showcasing, "What we are doing, and what you can do." Planned for this summer is a sustainability education component for our Woodward Tahoe Summer Camp in which we engage with 1,600 youth in week-long action sports camps.



## Bridger Bowl – Montana

### Reduce

Through the cooperative relationship with our local City of Bozeman Sustainability Director, the Western Transportation Institute and Bozeman's chapter of HRDC, the Bridger Bowl board of directors approved of a \$132,000 towards the purchase of one of three electric buses and two charging stations that were made available through a substantial low or no emissions grant made possible through the Montana Department of Transportation and the Federal Transit Administration. With the successful award of this grant, Bridger Bowl will have one, and possibly, two electric buses to provide free service on the weekends, and one electric bus to provide regularly scheduled service on weekdays during the ski season. These buses will be put back into the City of Bozeman's transportation fleet during the other 7 months of the year that Bridger Bowl is not operating.

### Other Progress

Bridger Bowl is a nonprofit community ski area located 16 miles north of Bozeman, Montana. In that Bridger is a day use area, we don't have the lodging accommodations that are typical of most ski resorts. As well, our mountain is very conservative with energy consumption and has a very modest grooming schedule. After completing the Uncommon Sense sustainability program through the Yellowstone Business Institute over 10 years ago, we made significant efforts to improve all our recycling of oils, cardboard and glass products as well as domestic waste products in our food services.

Wanting to be a supportive partner with NSAA's climate challenge, we signed up for the 2017-18 program.

Using our energy consumption data from 2016-17 season, we created a baseline for energy consumption data for the entire mountain using last season's numbers obtained from Northwestern Energy. However, for this 2017-18 season our primary focus was on our transportation program at Bridger Bowl. We have been offering free bus service from our Park & Ride location at our local County Fairgrounds in Bozeman for several years. In that Bridger Bowl is an easy 20 minute drive away from a ski town that lives to ski, it has been very difficult to change the independent transportation culture of our local Montanan residents. Especially with low gas prices these past few years, it has been very hard to discourage single travelers from driving up to the mountain, and filling up our parking lots and disproportionately negatively impacting the environment with their carbon footprint. Though Bridger Bowl has been working for years on encouraging carpooling and use of our bus service, we were still unsuccessful in changing this "one passenger/car" behavior.

Bridger Bowl has been the sole funding source for all of our bus programs, including our daily employee bus and weekend "kids" buses that involve the use of school buses on the weekends. Despite the significant investment our mountain has made in the past, we have committed to doing even more to make a significant impact. For the 2016-17 season we increased the bus service from 3 round trips per day, to bus service on the hour. We saw a significant increase in ridership and fewer cars in our ski area's parking

lots which often maxed out on big weekends. However, with rapid growth at our ski area, our parking lots were still crowded and we still had too many single rider vehicles coming to the mountain.

For the past few years, we have conducted an extensive awareness campaign about carpooling and free bus service on our website and most of our printed materials. We have promoted NSAA's Keep Winter Cool and more recently enlisted with the Protect Our Winters program. We also hold two major discounted skiing events during the winter where we required "3 on a wheel to get the deal". So, with car and busloads of 3 or more people, each passenger got a voucher for \$30 lift ticket or discounted food and ski lessons, if pass holders. Despite these efforts, our mountain's parking lots were not keeping up with our rapidly growing skier visits nor changing the driving habits of our locals. So, for the 2017-18 ski season, we committed additional funds to increase our free Bus Service to departures every 30 minutes from the Fairgrounds and then returning skiers from the mountain to town. This made our weekend bus service much more attractive to the locals and destination visitors, alike.

As part of our advocacy program, Bridger Bowl has been very proactive in working with our local Citizen's Climate Lobby, Protect our Winters and NSAA's national efforts to promote Climate Change awareness and Ski Industry Sustainability. During Doug Wales' tenure as marketing director for Bridger Bowl, he often participated on climate change panels offered by POW as well as the local Citizens Climate Lobby, and helped by providing in-kind support for raffles and fundraisers. As well, Doug worked closely with the Citizen Climate Lobby of Bozeman in making presentations to the Montana Ski Area Association and persuading their organization to officially adopt the climate change position and clean air resolutions put forth by NSAA. As Climate Change committee chair for NSAA, Doug sent letters to all of Montana's state and federal legislators and representatives advocating for clean energy legislation and incentives to Montana businesses. Most recently Doug participated on a 6 person panel discussion that followed the public showing of Saving Snow this past spring.



## Copper Mountain Ski Resort – Colorado

INVENTORY FY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	23,800	Copper continues its absolute reduction goal of 12,000 MTCO <sub>2e</sub> using 2011-2012 as a baseline.
Scope 3 (Solid Waste)	623	
<b>Total</b>	24,400*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Copper Mountain Ski Resort continued the lighting upgrades to their Base Area to reduce consumption, installed electric vehicle charging stations, and installed solar thermal heating at Solitude station.

### Other Progress

Copper Mountain continues our participation in the NSAA's Climate Challenge and our effort to reduce our carbon footprint. During this reporting period, Copper continued our base area building lighting retrofit project. An additional 333,579 kWh of annual power savings was realized. In many cases, older indoor lighting fixtures were completely replaced, rather than just upgrading the bulbs. New lighting fixtures allow for better light distribution, and allow for even greater electrical efficiency. In total our base area lighting retrofit project achieved 703,579 kWh of annual power savings. This is equivalent to taking 112 passenger vehicles off the road for one year. Copper's dedication to saving energy will continue on with a focus toward other areas of building efficiency. In addition to our base area lighting upgrades, Copper continues our conservation efforts through our dedication to waste reduction through commingled recycling, composting, and scrap steel recycling. These waste reduction efforts resulted in a 290 MtCO<sub>2</sub> reduction. In combination with Copper's other efficiency projects, a total carbon reduction of 468 MtCO<sub>2</sub> was realized for this reporting period. This is equivalent to taking 100 passenger cars off the road for a year. As a company and community of people who care about a reducing our carbon footprint, Copper Mountain is excited to continue our dedication to make the future a better place.

## Eldora Mountain Resort

INVENTORY FY 2017	MTCO <sub>2</sub> e	TARGET
Scope 1 & 2 (Req)	7,100	Eldora Mountain Resort will reduce Scope 1 & 2 emissions by 10% under 17-18 levels by 22-23.
Scope 3 (Solid Waste)	62	
Total	7,150*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Eldora Mountain Resort implemented lighting retrofits in Indian Peaks Lodge and the Vehicle shop, reducing electricity consumption by an estimated 100,000 kWh. Eldora also increased compost and recycling collection to divert an estimated 9 tons of garbage from the landfill.

### Other Progress

Since Eldora Mountain Resort was purchased by POWDR Corp. in June of 2016, staff has been encouraged to implement energy saving strategies through recycling, composting, waste reduction, lighting/equipment upgrades with the goal to reduce our carbon footprint. With POWDR's support, Eldora's first plan of action was to join the NSAA Climate Challenge to commit Eldora to take action against climate change. Additional sustainability programs and practices implemented are as follows.

1. Each year, Eldora replaces old snowmaking guns and lines with more energy efficient models. So far, 66% of the existing snow gun fleet has been replaced with energy efficient technology which use less water and energy.
2. Eldora joined the "We Are Still In" campaign to show our support of the Paris Climate Agreement.
3. Eldora joined the Partners in Energy for the Energy Conservation Summit. Partner resorts are: A-Basin, Breckenridge, Vail, Keystone and Copper where staff learned what energy conservation programs are in place at each partner resort, what renewable energy choices are available through Xcel Energy, continuing education and conservation opportunities.
4. Invited Boulder County's Partners for a Clean Environment (PACE) to audit opportunities Eldora has to determine achievable sustainability goals throughout our facilities. As a result, the resort installed high efficiency aerators in the bathrooms and kitchen areas; installed low-flow toilets in bathroom remodels; retro-fit low flow toilets and aerators in existing bathrooms.
5. PACE came to our Management University and trained all returning managers on how to recycle the resort's new line of compostable and recyclable Food & Beverage paper products.
6. PACE provided Eldora with easy to read signage for guest recycle, compost and trash bins.
7. Eldora is continuing to implement company-wide retro-fit upgrade incandescent bulbs and T8 fixtures to LEDs.
8. Eldora replaced all plastic and fiberglass signage at the resort with locally made handcrafted wood signs that can be easily repaired rather than replaced.
9. Eldora provided all returning managers, supervisors in 20 departments recycle bins for back of the house offices.
10. Food & beverage locations received large compost and recycle bins to use behind the lines to make it easier for employees to recycle.

11. Eldora increased recycle quantity over 28 months by 6.65 tons and compost by 2.68 tons
12. Began a company-wide initiative mandatory for employees to carpool or ride the RTD. Including complimentary bus vouchers and paying employees an extra hour a day for commute time.
13. Food and beverage department began a new menu rollout that will continue through the 2018-2019 season featuring locally sourced ingredients.
14. Used recycled timber removed for trail expansion to build tables and benches in Indian Peaks and Timbers Lodges.
15. Replaced 2 water fountains with refrigerated filtered water bottle refill stations.
16. Provided reusable shopping bags for retail and food & beverage use.
17. Eldora joined the "Suck the Straws Out" campaign to remove the use of plastic straws and plastic stirrers to offer paper straws upon request.
18. Donated 10% of proceeds from Earth Day/Closing Day event to Protect Our Winters (POW).
19. Worked with the Sierra Club and Middle Boulder Creek Coalition to enter into a Memorandum of Understanding regarding preservation of the Middle Boulder Creek Water shed from future development.
20. Donated 500 employee uniforms to Sharing Warmth Around the Globe (SWAG) through NSAA.
21. Donated \$2200 of end-of-season food surplus to the Nederland Food Pantry.



## Grand Targhee Resort – Wyoming

INVENTORY FY 2017	MTCO <sub>2e</sub>	TARGET
<b>Scope 1 &amp; 2 (Req)</b>	3,010	Grand Targhee Resort will reduce emissions by 2 percent under 2013-14 levels by 2020-21.
<b>Scope 3 (Solid Waste)</b>	113	
<b>Total</b>	3,120*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Grand Targhee installed a new central water heater in the Teewinot Lodge to replace older inefficient water heaters previously in each room. Furthermore, thanks to lighting retrofits, nearly 100% of base resort buildings are using newly installed energy efficient LED lightbulbs reducing electricity consumption by an estimated 125,000 kWh.

### Other Progress

Grand Targhee Resort had its busiest year on record with nearly 200k skier visits. With the increased business the resort is committed to increasing shuttle service, improving recycling, and reducing emissions per visitor. The resort continued with LED lighting upgrades to all base area buildings, including occupancy sensors in restroom facilities.

Out on the mountain, timers were installed in the chairlift houses to minimize electrical use on lights and heaters. To reduce single use water bottles, two new water bottle filling stations were installed in guest and employee areas. Employees are empowered to follow sustainability purchasing guidelines and make responsible buying decisions when available. For example, 100% of our marketing materials are produced by a local company. Our retail store, Teton Mountain Outfitters, sold over 1,000 reusable shopping bags to guests, eliminating their use of plastic shopping bags.

The Grand Targhee Shuttle is free for employees and lodging guests and resulted in over 31,000 riders this winter; up from 25,000 riders last winter. The resort continues to promote carpooling, especially on busy weekends. This year there was a POW Carpool Challenge throughout February. Guests who carpooled on the weekends were then entered into weekly drawings where they could win some great prizes. The resort purchased two new efficient diesel shuttles for the airport shuttle program. Program ridership increased by 50% over the past winter. The resort also implemented a new shuttle service with hotel pick-ups from Jackson, WY. These programs encouraged guests to keep their individual rental cars off the road. The resort also purchased two new large shuttles to maximize guest and employee ridership throughout the valley. The resort continues to enforce the No Idling policy for all vehicles, and the policy has been included into a group contract with bus transportation. The resort will continue to improve signage in efforts to educate guests about the No Idling policy.

Grand Targhee is dedicated to recycling across the resort, and now offers recycling bins in every lodging unit and vacation rental. All the chairlifts now have bear-proof sorted recycling bins, accessible year-round. The resort diverted over 27 tons of recycling from landfills this past season including over 300 lbs. of lift tickets.

Grand Targhee Resort's Protect Our Winters partnership program has donated over \$90,000 to local education programs and projects in the community that are in line with POW's mission. Guests can donate onsite, through their lodging reservation, or food and beverage bill. Employees can participate directly from their pay checks. The Resort in turn will match 100% of donations collected throughout the year.

In addition to fundraising efforts, carpool incentives, and projects, Grand Targhee Resort has integrated sustainability efforts into all employee training and orientation materials, as well as in our lodging information. Guest and employee education participation is strong with Resort Naturalist-led snowshoe tours, summer hikes, and staffing a year-round Nature Center. Resort Naturalists host field trips with local schools and offer natural history training for all mountain employees.

As Grand Targhee Resort welcomes increased business levels, the resort continues to look for ways to balance the impacts of increased visitors with transportation, waste stream management, emission goals and resort efficiencies.





## Jackson Hole Mountain Resort – Wyoming

INVENTORY CY 2017	MTCO <sub>2</sub> e	TARGET
Scope 1 & 2 (Req)	7,100	Jackson Hole Mountain Resort will reduce emissions by 5% under 2009 levels by 2020.
Scope 3 (Solid Waste)	not reported	
<b>Total</b>	7,100*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Jackson Hole performed a company-wide lighting retrofit.

### Other Progress

Jackson Hole Mountain Resort (JHMR) has set a high environmental standard for ski resorts of any size in North America by developing an Environmental Management System (EMS) and maintaining this program under external review for 11 years.

The EMS sets a standard via (a) integration of all departments to reach overall resort goals (b) continual annual improvement (c) thoroughness in monitoring, reporting and external verification to international standards.

In terms of audited resort-level objectives, each year every department must submit meaningful, attainable and measurable environmental goals to the JHMR Environmental Manager and report progress on previous goals. The goals must fulfill National Ski Areas Association Sustainable Slopes commitments regarding: (1) Planning design and construction, (2) water quality and conservation, (3) energy conservation and reduced carbon emissions, (4) waste reduction and recycling, (5) wildlife habitat conservation, (6) air quality/transportation, (7) visual quality, and (8) education and outreach.

The overall quantitative goals for JHMR’s EMS involve a reduction 5% reduction of JHMR GHG (greenhouse gas) emissions on an intensity basis (per skier visit) by 2020 relative to a 2015 baseline. Increase total MSW diversion to recycling and composting to 35% by 2020 compared to 2015 baseline. Reduce total hazardous waste volume production by one-third by 2020 compared to 2015 baseline and Reduce total on-mountain petrochemical spills to 0 by 2020.

Please check out Jackson Hole Mountain Resort’s “Environmental Responsibility” page if you are interested in learning more about their environmental efforts:

<https://www.jacksonhole.com/environment.html>



## Jiminy Peak Mountain Resort– Massachusetts

INVENTORY FY 2016	MTCO <sub>2e</sub>	TARGET
<b>Scope 1 &amp; 2 (Req)</b>	4,420	Jiminy Peak Mountain Resort, LLC will reduce emissions by 7% under 2011-12 levels by 2019-20.
<b>Scope 3 (Solid Waste)</b>	not reported	
<b>Total</b>	4,420*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Jiminy Peak performed an LED lighting retrofit on balance of slope lights with ROAMview software.

### Other Progress

- Jiminy Peak now has 4 EV car charging stations for our day and overnight guests, compliments of Tesla. We have two Tesla specific charging stations and 2 universal car charging stations available on site at no charge.
- Night skiing at Jiminy is now 100% under the glow of LED lights.
- Jiminy is currently constructing a second snowmaking reservoir to feed our gravity snowmaking system.
- Jiminy's snowmaking system exclusively uses Snowgun Technology Sledgehammer Towers and ground Guns. This technology allows us to operate at a 2:1 ratio producing significantly more snow at higher temperatures, using dramatically less energy.
- In addition to the renewable power purchased off the NEXAMP Peak Community Solar project, Jiminy now purchases renewable power from the Dudley Road Solar and Theodore Drive Solar Projects in Massachusetts.



**Killington Resort & Pico Mountain – Vermont**

INVENTORY FY 2016	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	4,850*	Killington and Pico Resorts will reduce emissions by 5% under 11-12 levels by 16-17.
Scope 3 (Solid Waste)	514	
<b>Total</b>	5,370**	

\*Killington & Pico Mountain were not included in overall program summary results because reporting does not include electricity emissions due to difficulties in data collection.

\*\*Scope 1, 2, and 3 may not add up to total due to rounding

**Reduce**

Killington Resort continued their recycling program and diverted more than 150 tons of materials from landfills.

**Other Progress**

Please check out Killington Resort's "Environment" page if you are interested in learning more about their environmental efforts: <http://www.killington.com/site/culture/environment>.



## Lutsen Mountains – Minnesota

INVENTORY FY 2017	MTCO <sub>2e</sub>	TARGET
<b>Scope 1 &amp; 2 (Req)</b>	4,090	Lutsen Mountains will reduce emissions by 2% for the facilities and terrain that existed in our baseline year by 2027-2028. We will concentrate our efforts on our lodging facility.
<b>Scope 3 (Solid Waste)</b>	not reported	
<b>Total</b>	4,090*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Lutsen Mountains reduced their emissions by adding insulation to the attic of Lodging Building D to increase the envelope’s R-value by 20.

### Other Progress

An emphasis on stewardship ensures the natural assets that make Lutsen such a special place remain the cornerstone of a North Shore vacation for generations to come. In recent years, we have:

- Installed innovative wastewater treatment systems.
- Formed the Poplar River Management Board which has invested \$2.5 million in water quality improvements.
- Installed a pipeline from Lake Superior as a sustainable source of water for our snowmaking and potable water for resort facilities and homeowners.
- Worked to minimize the impact of summer maintenance by implementing best practices for trail clearing and work vehicle access.
- Partnered with Conservation Minnesota to create a 'favorite places' website to foster a connection to the natural environment throughout the state.

Through the Climate Challenge we have been working toward making our buildings more energy efficient through projects like increasing insulation, converting to more efficient heating/cooling systems, and converting over to LED lighting. This year we will continue those projects and expand to other buildings.



## Mammoth & June Mountain – California

INVENTORY FY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	15,100	Mammoth and June Mountain will reduce emissions by 6% under 2013-14 levels by 2019-20.
Scope 3 (Solid Waste)	not reported	
<b>Total</b>	15,100*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Mammoth and June Mountain continued lighting retrofits throughout its ski area resulting in an estimated 167,756 kWh electricity reduction. In addition, upgrades were also made to snowmaking pumping systems.

### Other Progress

Mammoth and June Mountain (MMSA/JMSA) are constantly working to create a sustainable culture with our employees, guest and community. Below are the programs that have been implemented to try and reduce our environmental footprint.

- MMSA collaborated with students from Mammoth Middle School on a project to help reduce the environmental impact of plastic water bottles. To help reduce the amount of single use water bottles, a plan was developed and initiated to install water bottle filling stations throughout the resort. One filling station has been installed and is available to both guests and employees. Each year additional filling stations will be added to select locations throughout the resort.
- MMSA and JMSA encourage its guests to recycle and participate in utility conservation within our Hospitality venues. One of our lodging facilities provides a kid's eco kit which focuses on educating the next generation.
- MMSA has replaced 6 old, high polluting snowcats with new, more efficient Tier 4 engine snowcats. The Tier 4 standards set by the EPA require that emissions of PM and NO<sub>x</sub> be reduced by 90%.
- JMSA collaborated with the USFS to remove dead trees and brush around the mountain in order to maintain a healthy forest, reduce the fire danger, and maintain the water shed.
- MMSA works in conjuncture with the Town of Mammoth Lakes to offer a free bus system to both employees and guests. Employees from the surrounding towns are offered carpooling options and a bus that provides them with transportation to the Mountain. Mammoth also does a Bike to Work Week where employees are encouraged to bike to work.



Mt. Bachelor – Oregon

INVENTORY FY 2017	MTCO <sub>2</sub> e	TARGET
Scope 1 & 2 (Req)	6,840	Mt. Bachelor will reduce emissions by 3000 MTCO <sub>2</sub> e by 19-20 from 11-12 levels, RECs included.
Scope 3 (Solid Waste)	not reported	
<b>Total</b>	6,840*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

Other Progress

Unfortunately, 2017 spent most of the year without a sustainability coordinator and therefore, no one to continue to push carbon-saving initiatives through. The crew picked up steam again at the end of the year, and is hoping to make a lot of changes in 2018 -- most of those changes focused heavily on our waste/recycling. We will be eliminating most of our single-use items including to-go cups, straws, water cups, plastic utensils, and more. We are also starting a campaign this upcoming Fall to encourage the purchase of reusable water bottles and to utilize the new water bottle fill stations rather than purchasing plastic water bottles. We've also been working on some potential projects that would heavily offset our carbon usage in the future. More to come on that!



Mt. Hood Meadows – Oregon

INVENTORY FY 2016	MTCO <sub>2</sub> e	TARGET
Scope 1 & 2 (Req)	4,120	Mt. Hood Meadows will reduce emissions by 6% under 2010-11 levels by 2019-20.
Scope 3 (Solid Waste & Reimbursed Mileage)	23	
<b>Total</b>	4,140*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

**Reduce**

Mt. Hood Meadows undertook actions to reduce emissions at the legislative level.

**Other Progress**

For more information about Mt. Hood Meadows’ environmental commitment please see <https://www.skihood.com/about-us/environment>.



## Snowbird Ski and Summer Resort – Utah

INVENTORY FY 2016	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	25,800	Snowbird Ski and Summer Resort will maintain emissions at 2013-14 levels through 2024-25.
Scope 3 (Solid Waste)	1,500	
<b>Total</b>	27,300*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

This past winter Snowbird installed five electrical vehicle charging stations for guests and employees to use free of charge. These charges were donated by Utah Leaders for Clean Air and Tesla. To further reduce vehicle emissions, Snowbird has been working on creating the R.I.D.E app for a number of months. This encourages skiers and workers to take public transportation or carpool to the resort to earn points and earn prizes along the way. Additionally, Snowbird, CLIF, and GreenNotes all introduced Frontside Sessions this year which brought climate issues to attention with riders. In order to attend an exclusive concert on the tram, the public had to take a pledge to be more sustainable.

### Other Progress

While Snowbird has had a strong environmental ethic since its start in 1971, the sustainability program was formally founded in 2016. Under the sustainability program, Snowbird now focuses environmental efforts on how it will affect one of the following categories: reduce, improve or engage. Our goals are to reduce carbon emissions and waste, improve water and air quality, and engage with the community through education and advocacy around climate change. Please see Attachment 1 for more information.

Since 2016, Snowbird has made some significant changes to the resort. These include the creation of the R.I.D.E. program to encourage and incentivize carpooling and taking the bus, Electric Vehicle charging stations free for guests and employees, glass recycling at Snowbird, the initiation of a water conservation program and partnership with Slow the Flow, the creation of a sustainability program internship with University of Utah and Westminster College, continuance of tree planting with Tree Utah, and increasing our participation and support of Protect Our Winters and Rock the Vote through our new music endeavor with CLIF GreenNotes, Frontside Sessions.

While there has been a lot of improvements throughout the resort, there is still more work to be done. Snowbird continues to be proud to support and participate in the NSAA Climate Challenge and would like to find a way to encourage other ski areas to join as well.





Steamboat Ski & Resort Corp. – Colorado

INVENTORY CY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	12,100	Steamboat will reduce emissions by 5% under 2014 levels by 2020
Scope 3 (Solid Waste)	570	
<b>Total</b>	12,600*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

**Reduce**

Steamboat Ski & Resort Corp. developed an LED lighting replacement program which reduced electricity consumption by 1,275 kWh.

**Other Progress**

Steamboat continues to work with our local utility company on installing smart meters at the resort. These smart meters will improve our ability to see real-time electrical use. Furthermore, an error in reported natural gas numbers has led to a recalculation of its usage from 2014-2017. This recalculation will help provide a strong baseline with which to evaluate future efficiency projects.



Stratton – Vermont

INVENTORY FY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	7,860	Stratton Mountain Resort will reduce emissions by 10% under 2014-15 levels by 2019-20.
Scope 3 (Solid Waste)	407	
<b>Total</b>	8,270*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

Reduce

Stratton changed the T8 lights to LEDs at the indoor tennis courts and pool area, worked with Efficiency Vermont to make sure the kitchen air handlers were properly calibrated and implemented a plan to review snowcat productivity and idling.

Other Progress

Stratton continues to be a steward of the environment in all facets. We continue to make improvements to the efficiencies of our snowmaking system and lighting upgrades throughout the resort and our buildings.

Late last Fall we made a substantial upgrade to the HVAC system at our Training & Fitness Center. We were able to remove a 300,000 BTU steam generator that ran all year long, a 300,000 BTU boiler, 4 large pumps and a blower motor. We have estimated that the efficiency improvements will reduce energy consumption considerably and improve our environment by saving an estimated 64,000 kWh of electricity, 12,800 gallons of propane per year, and 230,000 pounds of carbon emissions per year.

The U.S. Environmental Protection Agency has recently issued two certificates of achievement to Stratton Mountain, one for the resort’s composting initiative and another for comprehensive recycling programs. We utilize easily identifiable compost bins in convenient locations. In 2016 we diverted 18.40 tons of compost, 49.06 tons since we began this initiative in 2014 and a 7 ton increase from 2015.

At Wanderlust Yoga and Music Festival, one of our largest events, we were able to divert 29% of total waste to our compost facility and 51% of the total waste for recycling.

We are happy to announce that we have partnered with Protect Our Winters (POW) to further climate change education and advocacy.



## Sugarbush – Vermont

INVENTORY FY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	3,540	Sugarbush will reduce emissions by 5% under 2011-12 levels by 2019-20.
Scope 3 (Solid Waste)	219	
<b>Total</b>	3,760*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Sugarbush continued LED lighting upgrades in various locations throughout the resort and made additional upgrades to refrigeration and air conditioning resulting in lower electrical usage.

### Other Progress

- Through upgrades to snowmaking technology Sugarbush has seen a reduction in energy consumption supporting ski area operations of approximately 28% since 2013.
- In 2016 we entered into a partnership with Green Lantern Capital of Waterbury, Vermont to support the development of solar energy in Vermont. Sugarbush purchases net meter credits from Green Lantern which provides an economic incentive for solar power generation in the state and allows Green Mountain Power to provide clean energy to its customers.
- In 2017 we partnered with Tesla to install 13 Electric Vehicle (EV) Charging stations in the Lincoln Peak base area. We aim to add more EV charging stations to the Mount Ellen base area and other key resort locations in the future.
- In the past few years Sugarbush has seen a reduction in solid waste. Since 2013 our diversion rate has increased from 30% to 35%. We compost in our food and beverage outlets as well many of our administrative offices and educational programs. We continue to recycle waste oil, rubber, electronic waste and scrap metal.
- Sugarbush continues its partnership with Green Mountain Transit (GMT) by providing free winter public transportation between our two mountains and throughout the Mad River Valley.
- Resort housekeeping is committed to using non-toxic cleaning supplies. Resort supplied toiletries are biodegradable and packaged in biodegradable and/or recyclable material. The resort linen program offers an optional reuse program to guests and housekeeping staff is trained to turn off lights and televisions in unoccupied rooms
- The Safety, Environment and Wellness (SEW) Committee has made great strides in supporting employee recommended improvements in its three areas of focus. Improvements and initiatives include:

- Commuter Challenge initiative which encourages employees to commute using alternative methods of transportation
- Resort Green Up Day where employees get out together and “green up” the resort property and surrounding area
- Formalization of a resort wide No Idling Policy
- Installation of 2 water bottle filling stations and in the Gate House Lodge with reusable cups to accompany the filling station in the Gate House Cafeteria
- “Trash Talkers,” volunteers and staff who coach guests on how to recycle/compost and sort their trash properly
- Reduced the use of plastic straws in Food and Beverage outlets in collaboration with the F & B department

Sugarbush Resort is committed to preserving and improving the natural environment in which it is located. The resort has undertaken many projects to combat climate change and reduce our environmental impacts, from making significant financial investments in low-energy snow guns and LED lighting to utilizing toxin-free cleaning supplies across the resort as well as implementing storm-water remediation projects. We partner with many local, state and federal organizations including the U.S. Forest Service, VT Agency of Natural Resources, Friends of the Mad River, Mad River Path Association, Green Mountain Club and the Catamount Trail Association. Timbers Restaurant is a member of 1% for the Planet, a collection of business pledging one percent of revenues to environmental causes.

# TAOS

## Taos Ski Valley – New Mexico

INVENTORY CY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	3,020	Taos Ski Valley will reduce emissions by 20 percent under 2014 levels by 2020.
Scope 3 (Solid Waste)	NR	
<b>Total</b>	3,020*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Taos Ski Valley purchased 20 high efficiency HKD snowguns, 10 impulse and 10 vipors, which allowed it to take five high energy requiring snowguns out of the current fleet. Overall this reduction effort has decreased emissions by 102 MTCO<sub>2e</sub>.

### Other Progress

Taos Ski Valley is undergoing a major revitalization since coming on under new ownership in 2014, our baseline year for the NSAA Climate Challenge. An overview of our journey, detailed below, helps to explain our GHG emission increase over the past 4 years and steps we are taking to reduce our footprint.

#### 2014

- Purchased the Bavarian Lodge

#### 2015

- Added a new triple chair lift to our highest in-bounds peak with a patrol station built at the top of it
- Erected a sprung structure
- Unveiled an employee shuttle program resulting in taking approximately 130 cars off the road each day during ski season

#### 2016

- Construction begins on resort's first hotel property

#### 2017

- The Silver LEED certified Blake Hotel opened to guests
- Two electric car charging stations were installed
- Property expansion occurred to accommodate employee housing needs
- The beginner hill was recontoured to make it more beginner friendly
- Natural gas was brought into the valley, replacing propane as a major fuel source and decreasing overall emissions
- Replaced two snowcats with final TIER 4 models resulting in most of the fleet being TIER 4 models which is 10-15% more fuel efficient
- Major renovation of Children's Center
- Replaced two antiquated lifts on beginner hill with a pedestrian gondola and a triple chair

- Introduced automation to snowmaking system by adding phase 1 of Snowmatic
- Purchased 20 high efficient HKD snowguns (10 impulse and 10 vipers) replacing 5 high energy snowguns

## 2018

- Removal of two antiquated lifts. Replacing our base area quad lift with the area's first high speed quad.
- Major renovation to the Phoenix facility
- Upgrade to The Bavarian facility
- Renovation of administrative offices
- Renovation of sprung structure
- Adding to our snowmaking capabilities by extending the system to the top of Chair 4
- Purchasing 30 more additional high efficient HKD impulse snow guns
- Adding additional locker space for guests
- Renovations to public bathrooms in main resort center
- Purchase of food digester which converts food waste into soil amendment
- We have updated our fleet of utility and mountain trucks purchasing newer and more fuel efficient models and reducing the number of vehicles from 65 in 2015 to our current number of 48.
- Additional buildings will begin to be built out with LED fixtures and occupancy sensors standard in all buildings

Throughout this revitalization and expansion, we have kept a focus on sustainability and are continually looking to implement green practices. As detailed above, we continue to invest in energy efficiency measures ranging from:

- New energy-efficient snowmaking guns (which have increased in usage due to erratic and low snowfall)
- Replacement of two snowcats to final TIER 4 models
- Increase natural gas and decline propane usage
- Outfitting facilities with LED fixtures and occupancy sensors as they undergo renovations/are built



## Telluride Ski Resort – Colorado

INVENTORY CY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	6,300	Telluride Ski Resort will reduce emissions by 8% under 2017 levels by 2025.
Scope 3 (Solid Waste)	not reported	
Total	6,300*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Telluride Ski Resort installed more efficient, low-energy snowguns and new weather stations designed to allow snowmaking to be operated remotely. Furthermore, Telluride purchased the Mountain View apartment building for employee housing along the public transportation corridor to increase employee commuting opportunities.

### Other Progress

TSG’s environmental initiatives and stewardship are an ongoing process that includes the pursuit of knowledge and collaboration with the USFS. TSG continually pursues the latest in technology to make decisions based on the most efficient and sustainable options available. Advances in technology have enabled TSG to change every day processes resulting in a reduction of the consumption of paper. The Mountain Operations department has been able to automate the snowmaking processes and reduce the amount of fuel required to travel on the mountain. TSG also recognized an important opportunity that enabled them to provide employee housing located at the base of the ski area. The ski area works closely with the USFS to monitor and manage the forest health within the permitted area. These efforts include noxious weed control, spruce beetle mitigation, and overall forest health. TSG assesses all available opportunities and bases its decisions on making sure the efforts are sustainable environmentally friendly.

### Indirect Emissions Reduction

#### *Administration*

Over three years ago, our accounting department started the process of becoming paperless. Since that time, the company has reduced the paper consumption by approximately twenty-four tons. The paperless process continues to be refined and is expanding into other departments with new advances in technology.

#### *Employee Housing*

Telluride Ski and Golf focused its energy and funding in 2017 on the rehabilitation of an existing building, Mountain View Apartments, located at the base of the ski mountain to create 30 employee housing units. The building was vacant for years and an eyesore in the Town of Mountain Village. TSG acquired the building to create new employee housing that is conveniently located next to free public transportation. Not only can employees utilize the public transportation to commute to work, it also gives access to the entire

community. The proximity of the units to the local trail system encourages alternative forms of transportation including walking, hiking, biking, and even skiing! The Mountain View Apartments were carefully planned and executed to be both comfortable and energy efficient. TSG used LED lighting for the interior and exterior of the building. The faucets and showerheads are low flow and the toilets are low flush. TSG installed new energy star appliances and combination boilers in each unit. Combo-boilers provide both hot water and heat to each unit using natural gas powered fan coils. The apartment building siding is all recycled wood and rolled metal, giving the building a modern look and maintaining strict environmental and sustainable standards.

## USFS Stewardship and Management on the Ski Area

### *Noxious Weed Control*

TSG collaborates with the USFS for all treatment of noxious weeds present within the permit area. This ensures that TSG remains compliant with all applications and aids in the continued monitoring of noxious weed growth and treatment programs year after year. Through the growing season TSG Operations communicates any new or advancing areas of noxious weeds as well as continued training of personnel to not only be able to identify noxious weeds, but procedures to prevent the spread and/or introduction of noxious weeds on the mountain.

### *Spruce Beetle Mitigation*

TSG has engaged in spruce beetle mitigation for over 15 years with the guidance and aid of the USFS. Monitoring continues around the Ski Area to identify areas where the spruce beetle is present and the effectiveness of mitigation tactics. Currently TSG is working with the ski area to continue to debark wind thrown spruce trees and identify areas to set “trap trees” on the Mountain.

### *Forest Health*

Telluride Ski and Golf, recently worked with the USFS to fund a Vegetation Management Plan for the forest within the permit area. This Plan along with SBEADMR (Spruce Beetle Epidemic, Aspen Decline Management Resolution) are used as a guide for all current and future work within the forest on the Ski Area including all future improvements to skiable terrain and trail corridors. A portion of forest within the permit boundary has also been used as a test site to show different management techniques for creating defensible space around homes and wildland fire mitigation techniques in the forest. Plans are to continue this work and implement more wildland fire mitigation techniques around the ski area infrastructure and terrain.



## Timberline Lodge

INVENTORY CY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	5,030	Timberline will reduce emissions by 5% under 2017-18 baseline levels by 2023-24.
Scope 3 (Solid Waste)	NR	
Total	5,030*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Timberline Lodge performed a lighting retrofit in the Mountain Maintenance Shop, replacing T12 light fixtures with T8 fixtures. This retrofit reduced electricity consumption by 5,934 kWh.

### Other Progress

In addition to our Climate Challenge Inventory-Target-Reduce activities this year, we have been working to change the overall perception of sustainability across all aspects of our operations. Department heads in Food and Beverage, Overall Operations, and Mountain Operations have been implementing new educational programs and guidelines to help their departments reduce their environmental impacts.

Our Food and Beverage Managers have been striving to source products as locally as possible to reduce emissions generated by deliveries to supply our 7 food venues. Examples of this include: raising and processing our own grass fed beef for everything from hamburgers in the cafeteria to premium-cut steaks in the finer dining venues; sourcing beverage products such as coffee, tea, and juice from local processors; working with local farmers to secure seasonal, organically grown produce; and seeking out locally, sustainably-produced wine.

In the past year, we have implemented a number of new programs to reduce our paper consumption by converting to electronic systems. These include electronic Purchase Orders, Invoices, Liability and Release Forms, and Accident Reports. Employees are strongly encouraged to use our direct deposit program in lieu of paper checks.

The Mountain Operations Directors have placed new recycling bins in strategic places on the ski hill and have educated on-hill employees to encourage guests to use them properly in order to reduce waste and litter. Additional education for all employees regarding our recycling and waste handling policies has been included in the Employee Handbook as well as New Employee Orientation and Annual Employee Refresher Training. Also, all pass holders were educated on the importance of keeping our mountain clean by recycling and respecting our waste handling facilities.

Finally, we are creating a new, dedicated full-time position for Sustainability Manager to work across all departments in order to develop and implement additional programs and bring unity to our sustainability efforts.

## Tremblant Ski Resort

INVENTORY CY 2017	MTCO <sub>2e</sub>	TARGET
Scope 1 & 2 (Req)	3,330	Tremblant Ski Resort will reduce emissions by 5% under 2017 levels by 2022.
Scope 3 (Solid Waste)	1,540	
<b>Total</b>	4,870*	

\*Scope 1, 2, and 3 may not add up to total due to rounding

### Reduce

Tremblant Ski Resort extended the collection of compost in resort restaurants, reducing waste emissions by 50 MTCO<sub>2e</sub>. Tremblant also replaced a TIER 2 snowcat with a more eco-friendly TIER 4 and formed an eco-driving program.

### Other Progress

Tremblant is very proud to have crossed an important milestone in its continuous efforts and objectives in sustainable development and eco-responsibility.

To assist us in developing actions plans to ensure that this culture continues for many years, we've teamed up with the Conseil Des Industries Durables CID (French only website) a non-profit organization that ensures the integrity, transparency and coherence of sustainable development in communities and industries.

Tremblant selected the CID for its methodology in implanting roadmaps for continuous improvements to integrate and progressively enforce eco-responsible management practices and for its support in providing an expert in sustainable development who will accompany us throughout this process.

The Eco-responsible certification is an integrated global approach using best practices and principles in sustainable development. The CID proposes a 4-level certification program: Engagement, Performance, Optimum and Elite.

For us, this process began several months ago with the creation of an eco-committee dedicated to developing a solid and measurable plan which would be the basis for a permanent and long term eco culture shared amongst its team members, guests and suppliers.

The CID awarded a level 1 ENGAGEMENT certification based on the charter and 5-year plan created by our eco-team. The plan includes 4 major directing axes based on issues that are closest to our hearts and environment.

- Reduction in greenhouse gas effects
- Raw materials and residual management
- Product and service quality
- The impact on regional economic development

Each of these axes has its own set of objectives and action plans which will be deployed over the next years.

Our entire team is extremely proud of this important certification and we encourage our entire industry to follow the movement.

Follow our blog or consult the web site to learn more about our Eco-projects and actions we can all participate in.

### 3.3 Next Steps for the Climate Challenge

The Climate Challenge continues to grow with new Challengers participating each year. As the Challenge enters its eighth year, the program continues to evolve and grow. The 2018-2019 season presents new opportunities to evaluate the current status of the program, share sustainability best practices with resorts, and continue to explore opportunities for resort benchmarking. It also presents opportunities to welcome new non-resort participants to the challenge and test out tracking and reporting tools on their operations.

Moreover, the time horizon for many targets is coming near, with many of the original targets set for 2020. This year it will be important for those resorts to evaluate progress to-date and look for opportunities to establish new targets and enhance their climate and sustainability commitments.

## 4. Economics of Sustainability

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### 4.1 Economic Analysis of Ski Area Sustainability

NSAA includes sustainability-related questions in the NSAA Economic Analysis of United States Ski Areas survey with an eye toward exploring the link between investing in sustainability and a resort's bottom line. This year's (2017/18) Economic Analysis survey results will not be released until mid-October. For that reason, we include last year's results in this report. Here is background on the first three years of data gathered on the economics of sustainability.

#### Background

More than 75 percent of NSAA member resorts have some kind of sustainability effort underway. While there is plenty of data available on individual capital projects and how they result in financial benefits for ski areas, from lighting retrofits to efficiencies in lift operations and snowmaking upgrades, what did not exist until recently was data on the aggregated benefits of comprehensive sustainability programs to the financial balance sheet of ski areas.

NSAA looked for help on this data collection and analysis effort from two long-time consultants to the ski industry – sustainability consulting firm Brendle Group and market research firm RRC Associates. In reviewing the first year's data, they found a positive correlation between sustainability and profit, and a message of lost opportunity for the shrinking pool of ski areas without sustainability programs. NSAA has permanently incorporated sustainability questions into its longstanding survey for the Economic Analysis of United States Ski Areas, so we can all look forward to years of forthcoming data on this important subject.

#### Survey Questions

Below are the questions included in the Economic Analysis survey.

**Sustainability Measures.** In the last 2 years, has your resort invested in any of the following sustainability efforts? (PLEASE CHECK ALL THAT APPLY; LIST CONTINUES ON NEXT PAGE)

Renewable Energy Generation: Installed renewable energy on-site (if yes, please list system(s) type (e.g., solar, wind, hydro) and size in kW):

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Existing Buildings: Implemented energy retrofits in existing buildings (if yes, please estimate kWh/year energy savings):

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New Construction: Implemented sustainability into new construction or major renovations

Snowmaking Efficiency: Invested in energy or water efficiency improvements in your snowmaking operations (if yes, please estimate kWh/year in energy and kGal/year in water savings):

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- Lift modernization: Added new lifts or replacement lifts with higher efficiency
- Lift operations: Implemented energy retrofits in existing operations – heating timers and controls, waste heat recovery, etc.
- Utility Energy Management: Implemented measures to improve electric power quality or reliability, manage peak load/demand costs, or change rate structures for cost-savings
- Fleets and Grooming: Invested in equipment fuel efficiency or alternative fuels
- Food and Beverage: Made improvements to green purchasing, waste reduction, recycling or composting programs
- Marketing and Sustainable Brand: Incorporated sustainability into branding or customer communications
- Accounting: Completed a greenhouse gas inventory
- Other: (please specify):

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HR: What is the estimated level of staffing allocated to your sustainability efforts, in full-time equivalent (FTE) across all departments? (0, <1, 1, 2 or more):

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In the initial year, the Brendle Group/RRC team collected this information and applied information on hand from the 2011-12 Economic Analysis of U.S. Ski Areas, which allowed the team to segment and evaluate data by region and by ski area size. The team examined the sustainability programs and activities of all 115 ski areas participating in that year's Economic Analysis and created a sustainability "performance index score" to rate the sustainability performance of each area. The team scoured available information from NSAA and web research—from energy programs and projects to fleets, food and beverage, marketing, and human resources—to document the performance of more than 215 ski areas that together represent more than 70 percent of annual skier visits in the U.S. The sustainability performance index score was then matched to the 115 ski areas that participated in NSAA's annual Economic Analysis survey.

Ski areas were grouped into three performance levels based on their sustainability index score. Those with little to no active sustainability program were assigned "green circles," those with some activity "blue squares," and the highest performers "black diamonds." From there, RRC was able to analyze financial performance at the company income statement level.

## 4.2 Initial Year Results

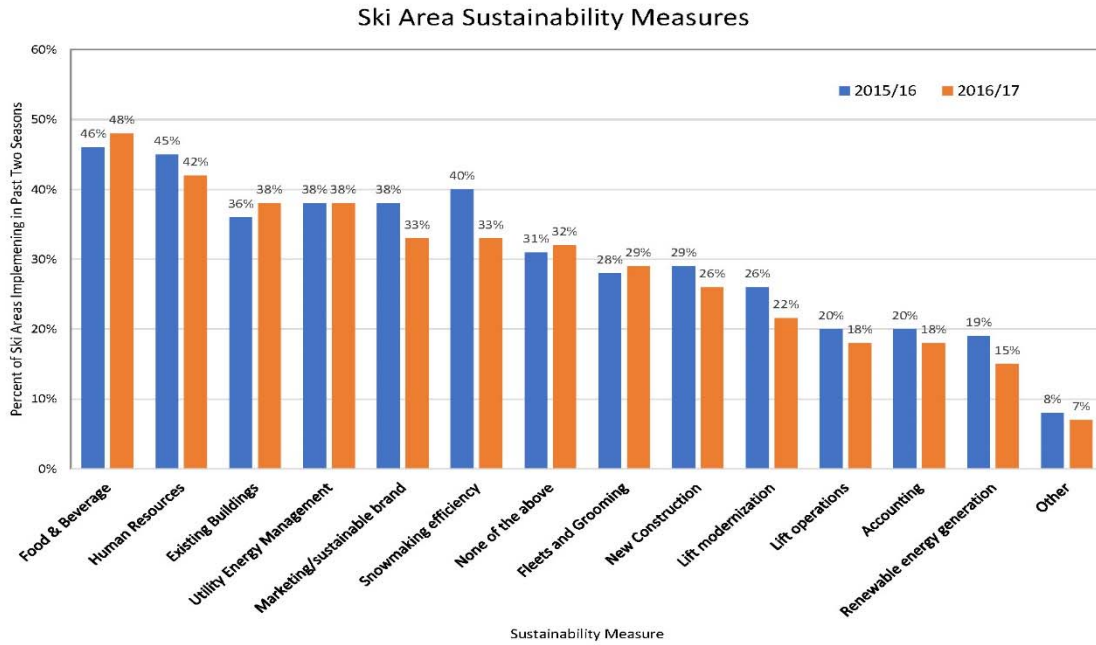
Initial year results showed that ski areas could realize at least a 2 percent increase in profit in the first year after initiating a comprehensive sustainability program, with increasing profits in years two through five as the result of the accumulation of sustainability benefits. Based on ski area financial data broken out by region, some regions could see greater profit increases than that.

When comparing the 2011-12 financial performance data to the sustainability performance index of ski areas (green circles, blue squares, black diamonds), the findings were somewhat mixed likely due to a range of other financial factors, as well as ski area size and geography. One trend, however, did emerge: Overall, those ski areas rated as “blue squares” in the sustainability performance index—or those with active sustainability but not leading-edge sustainability programs—had the highest operating profit at 25.6 percent, followed by “black diamond” at 21.8 percent. The areas rated as “green circles” realized the lowest operating profit at 19 percent, compared to an overall average across all three levels of 23.1 percent.

Why did the “black diamond” sustainability performers not exceed the “blue squares” in financial performance? There may be several factors at play. First, because the study only included one year of financial data, it’s possible that the highest performers are taking on more ambitious projects that won’t result in near-term outcomes but could have long-term benefits. Second, leading-edge sustainability performers are likely more inclined to look past short-term financial returns when picking high-profile, legacy sustainability projects. Third, the black diamond group comprises much larger ski areas with an average of \$38.6 million in revenue and \$8.4 million in operating profit, affording them a greater financial base from which to invest in sustainability projects. See <http://www.nsaa.org/environment/sustainable-slopes/> for detailed information on year one results from this study.

### 4.3 2016/2017 Results

During the 2016/17 season, NSAA again collected data on investment in sustainability through the Economic Analysis. Over a hundred resorts responded to the survey in this fourth year of data collection. The numbers for 2016/17 showed a leveling out of investments in sustainability efforts (see chart below). Briefly, as the chart below reflects, the most common sustainability-related actions were in these departments/areas: Human Resources (48 percent); Food & Beverage (42 percent), utility energy management (38 percent), improvement to existing buildings (38 percent), marketing/sustainable brand (33 percent), snowmaking efficiency (33 percent), and fleets and grooming (29%). While the number of sustainability initiatives at reporting resorts is encouraging, there is still a percentage of resorts (32%) that did not made any improvements in the past two seasons.



#### 4.4 Looking to the Future

Beyond the financial results, what’s telling about the overall results is that more than 75 percent of all ski areas have some form of sustainability program in place—a statistic that doesn’t bode well for the fewer than 25 percent of ski areas that are sustainability laggards. Simple and effective changes could lead these ski areas to significant financial, risk reduction, brand image, and other benefits.

The results of this study also show significant promise on correlating sustainability and improved financial performance across the ski industry, and helping ski areas benefit from both. NSAA plans to conduct an in-depth analysis of the data, such as that done in year one, every five years to gauge progress. With more data available down the road, NSAA can examine sustainability benefits to a greater extent, as well as to dig deeper into the expense side of the equation, including energy and snowmaking cost differences. NSAA will continue to report on the economics of sustainability data collected in future years through the Economic Analysis and this Sustainable Slopes Annual Report.



## 5. Contributions of Partnering Organizations

NSAA would like to thank and recognize our partners in Sustainable Slopes – old and new – for their contributions to this important program.



### Audubon International

Audubon International is a not-for-profit 501(c)(3) environmental education organization dedicated to providing people with the education and assistance they need to practice responsible management of land, water, wildlife, and other natural resources, thus leading to more sustainable communities. To meet this mission, the organization provides training, services, and a set of award-winning environmental education and certification programs for individuals, organizations, properties, new developments, and entire communities. The organization has been in existence for over 25 years and has helped over 3,000 facilities and communities across the world work toward certification. AI presently administers four distinct programs, the Audubon Cooperative Sanctuary Program (ACSP), the Signature Program, the Green Lodging Program, and the Sustainable Communities Program. The most widely known program (and largest by membership) is the ACSP. The ACSP is an education and certification program that helps organizations and businesses protect our environment while enhancing their bottom line. The "plan-do-check-act" approach of the program offers information and guidance to implement an environmental management plan that improves efficiency, conserves resources, and promotes conservation efforts. AI awards certification to publicly recognize and reward the environmental achievements and leadership of ACSP members. The ACSP for Golf Courses is a widely recognized and highly-regarded education and certification program that helps protect our environment and preserve the natural heritage of the game of golf. The ACSP and other AI programs serve as valuable resources by facilitating the conservation and restoration of wildlife habitat, enhancing environmental health, improving economic efficiency by reducing operating costs, minimizing potentially harmful impacts of management operations, and providing facilities and communities with valuable communications and marketing tools.

NSAA is thrilled to have AI as a Partnering Organization in Sustainable Slopes. NSAA looks forward to working with AI to achieve our common goal of advancing sustainable natural resource management on ski area and resort properties.



### Brendle Group

Brendle Group is an environmentally focused engineering consulting firm that leads by example, inspiring and empowering people to make thoughtful choices about the resources they use and helping them create realistic road maps for sustainability. Founded in Fort Collins, Colorado in 1996, Brendle Group serves clients nationwide, leveraging the strength of what its clients do well with their sincere desire to do

more for people, profit, and planet. Brendle Group has consulted on NSAA's Sustainable Slopes program for over fifteen years.

In its 20+ years of business, Brendle Group has completed hundreds of projects and assessments for a wide range of clients. Brendle Group has developed sustainability management systems and plans for governments and businesses, measured systematic and site-specific greenhouse gas emissions and developed climate action plans, helped clients reduce their energy and water use, and contributed to leading-edge sustainable design projects. Brendle's clients range from federal and state government agencies to cities, counties, multi-stakeholder groups, non-profit organizations, industry associations and businesses. We're known for our ability to form strategic partnerships and collaborations to tackle projects of any size, working with clients nationwide.

NSAA and the endorsing resorts are fortunate to have outside organizations playing a key role in Sustainable Slopes.



### CLIF Bar & Co.

Clif Bar & Company crafts nutritious and organic food to feed and inspire adventure. Family and employee-owned, the company is committed to sustaining its people, brands, business, community and the planet. CLIF Bar has partnered with NSAA on climate change since 2004 and sponsors the Grant Program. For more information, please visit [www.clifbar.com](http://www.clifbar.com), or check them out on Facebook [www.facebook.com/clifbar](http://www.facebook.com/clifbar) Twitter [www.twitter.com/clifbar](http://www.twitter.com/clifbar) and Instagram [www.instagram.com/clifbarcompany](http://www.instagram.com/clifbarcompany).

### Forest Stewardship Council



The Forest Stewardship Council is a third-party certifier of forest products. FSC certifies responsibly managed forests so that consumers can have confidence that wood and paper products carrying the FSC logo come from well-managed forests. In addition to building materials, FSC certifies the types of paper products that the ski areas depend on, from trail maps and brochures to paper plates. In furtherance of achieving the goals identified for ski areas in the Sustainable Slopes Charter, NSAA is partnering with the Forest Stewardship Council to

advance sustainable practices at ski areas.

FSC works with the Sustainable Slopes program incorporate information on the benefits of using FSC-certified products as means of fulfilling the Principles of the Sustainable Slopes Charter. FSC also works with NSAA to educate ski areas about FSC-certified products.

Both NSAA and FSC are committed to working together to improve the environmental sustainability of resort operations. We both recognize that the long-term sustainability of natural resources is essential to maintaining the quality of the recreation experience for resort visitors.



## HKD Snowmakers

HKD Snowmakers is a long-standing family run business founded in 1991. HKD was born of the fundamental need for ski resort operators to ensure quality, cost effective snow coverage for their customers. Herman Dupré, of Seven Springs in Pennsylvania, recognized that the success of his resort was directly connected to a dependable snow surface. He was determined to find a more efficient and economical method to produce snow.

In 1973, Mr. Dupré applied for the first of his many snowmaking patents. Over the next seventeen years, he continued to experiment and improve upon this nascent technology. In 1990, all the science, research, and testing resulted in a snowgun that was ready for wider release. Mr. Dupré partnered with his son-in-law Charles Santry and daughter Anni to form Snow Economics / HKD Snowmakers in 1991. Their first product, the "HKD Standard" became the most transformative snow gun used by resorts industrywide. Ian Jarrett, a college friend of Charles', joined the company in 1992 as Vice President. "HKD" has now become synonymous with low energy tower guns. In 2011 HKD merged with Turbocristal, a fan snowgun manufacturer with a strong team of engineers and manufacturing personal headquartered in Quebec City, Canada. This combination added management expertise, supplemented the product line with the HKD Turbo Fan, and increased engineering and R&D capabilities. In 2018 HKD acquired HKI. In 2018, HKD acquired the Controls, Monitoring and Automation business of Sno.matic based in Lyme, NH. Operating under the name iSno Controls and Automation, this new division of HKD Snowmakers will leverage the inherent strengths of both companies. HKD has sponsored the Sustainable Slopes Grant program since 2010 through the donation of SV-10 high efficiency snowmaking guns to deserving resorts.

## Ultra-Tech Lighting



Ultra-Tech Lighting, LLC, based in Closter, New Jersey, manufactures, distributes, and installs magnetic induction lighting products, light emitting diodes, and alternative fixtures around the globe. The company also provides technical consulting services. New to the Sustainable Slopes Grant Program this year, Ultra-Tech Lighting will offer a grant of ten (10) Snow-Bright™ fixtures to a deserving ski area. Snow-Bright™ is a unique magnetic induction lighting line specifically designed to illuminate ski slopes, tubing parks, cross country skiing areas, and other snow recreation facilities. Snow-Bright provides a better night skiing and riding experience for resort customers while answering the call for sustainability and economy. Snow-Bright™ fixtures are uncompromising on performance and quality with 5-year/50,000 hour warranties and expected life cycles exceeding 100,000 hours; 11 years operating 24 hours x 365 days per year. Resort operators can save up to 60% on electricity consumption over high intensity discharge (HID) and high pressure sodium (HPS) lights. Snow-Bright is more than energy efficient lighting. While saving up to 85% over conventional lighting in operating electricity, Snow-Bright also substantially reduces "in-rush" current associated with electricity demand charges. This can save shave enormous amounts off total energy bills. Its silent ballasts are safe for bats and canines and its light spectrum will not disturb nocturnal wildlife. Ultra-Tech Lighting looks forward to playing a significant role in ski industry sustainability.