

Stowe invests in more efficient snow-making equipment

The snow spewing from an HKD tower gun near the chair lift at Stowe is fine and granular, like salt from a shaker, but it's bouncing nicely off the jacket sleeve of Scott Reeves, vice president of mountain operations.

"We do what we call the sleeve test," Reeves says over the loud hiss of the gun. "If the snow sticks right to the sleeve, it's too wet. If you get a little bounce and you can brush it off, that's good quality snow. See how the pellets are bouncing off my jacket? That's good quality snow."

Good enough for a decent number of skiers to be schussing the slopes of Mount Mansfield, where they wouldn't be skiing this weekday afternoon if not for the resort's massive snowmaking operation, given the previous weekend's meltdown with 40-degree temperatures.

"If we had to totally rely on Mother Nature we wouldn't have terrain open," Reeves said. "We're not quite going to have snow as dry as she can make it, but we're close, and we can make it when we want to and where we want to."

Looking toward Spruce Mountain, where the plumes of white powder coming from the snow guns float above the treeline, Reeves says Stowe skiers are voting with their feet — strapped to skis.

"Ask any one of our customers today, the majority are skiing under those guns," Reeves said. "Particularly with tower guns. When we fire up tower guns, a lot of people will ski under them."

Reeves is observing a test being run by Efficiency Vermont on the resort's newest tower guns to determine just how efficient they are. Efficiency Vermont is the ratepayer-funded organization that consults with state businesses on energy efficiency; the testing it's doing at Stowe is already having a profound impact on the resort's planning for the future.

The Efficiency Vermont test rig is essentially a sled with gauges and hoses to monitor the water and air lines that feed the tower gun. The gauge for the compressed air measures the flow in cubic feet per minute, or cfm, while the gauge for water measures the flow in gallons per minute, or gpm.

"To make snow, you need compressed air and water," said George Lawrence, Efficiency Vermont's technical consultant to the ski industry. "An internal-mix ground gun is the least efficient type of gun compared to the tower guns. Instead of using all the air to propel and give the hang time you need to keep water in the air long enough to freeze, the tower gun starts the water 20 to 30 feet in the air. The elevation provides the hang time and propulsion, not the compressed air. That's the biggest difference."

Snowmaking, with its infrastructure of buried water and compressed-air lines running up and down the slopes, storage ponds and pumping stations, and banks of diesel and electric air compressors, is a very expensive and energy-intensive proposition.

“Over 60 percent of a mountain’s annual energy consumption can happen in 800 hours just from snowmaking,” says Michael Leonard, a key account manager with Efficiency Vermont who works with Stowe. “There are 8,760 hours in the year.”

For the snowmaking operation at Stowe, Reeves figures he spends about \$1 million per year on electricity and fuel to run his diesel and electric air compressors; about \$750,000 per year for labor; and about \$300,000 per year for upkeep and maintenance on equipment; for a total annual cost of just over \$2 million.

Reeves checks the gauges on the Efficiency Vermont test rig and notes the new tower gun is using 115 to 130 cfm of air to make snow. A conventional ground gun, he says, draws 400 cfm to do the same job.

“It’s pretty significant for us to see that,” Reeves said. “I can run almost four of these new tower guns for every one of our old-technology guns, which means I’m covering bigger distances in a shorter amount of time. That’s where we get our efficiencies.”

Stowe already has 230 of the tower guns in place on its slopes, at about \$3,600 each, but to bring the resort fully into the 21st century in terms of energy efficiency, Reeves says he’s going to have to buy another 230 tower guns.

But once that’s done, the savings are going to be enormous. “Annually you’re looking at half a million bucks by the time you’re done,” Reeves said. “We’ve been doing those studies to look at what happens once we get the majority of our equipment to these energy-efficient guns. And that savings is every year.”