

Green Design Strategies For the Intrawest/Aspen Skiing Company Snowmass Base Village Development

Prepared by Auden Schendler
Aspen Skiing Company Department of Environmental Affairs

Overall Goal

Intrawest and Aspen Skiing Company (“the partnership”) are committed to creating the ski industry’s first truly “green” (environmentally responsible) base village. In pursuing this goal, the partnership is focusing on energy use, because pollution associated with energy consumption comprises the primary “ecological footprint” of a resort development. Other critical environmental issues—such as transportation and solid waste management and recycling, are already incorporated into the village planning process.

Energy: Overreaching Measures

- In order to achieve comprehensive greening, the partnership decided that an overall energy goal would be necessary. Designers have been asked to exceed local energy code by a minimum of 30%. The partnership has committed to this target.
- A second broad goal is to achieve U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) certification for four commercial buildings in the development. (Buildings 3abcde and buildings 9a and b.) LEED certification is the first and most widely accepted method for green building certification. Currently there are only two LEED buildings in Colorado, (and only about 45 in the U.S.) one of which is owned by Aspen Skiing Company. A commitment to build four such structures is ambitious. (www.usgbc.org)
- To achieve these green building goals, the partnership hired Peter Rumsey, a consulting mechanical engineer considered to be one of the finest efficiency engineers in the world. (www.rumseyengineers.com) Rumsey is collaborating with project engineers from Beaudin-Ganz, another firm with extensive experience in green design and LEED architecture. (www.bgce.com)

Energy: Specific Measures

The partnership has committed to implementing the following measures:

- **Building Commissioning.** We will “commission” all buildings in the village. This means that a third party engineer will inspect the heating, ventilation and air

conditioning systems of all structures to ensure they are operating to specifications. Building commissioning is not standard practice in the construction industry (in fact it is very rare) in part because it adds significant expense. However, studies show that most mechanical systems do not operate properly without commissioning, and that energy (and operational cost) savings can range from 6 to 40 percent as a result of commissioning.¹ *This is the single most important environmental measures being undertaken at the base village.*

- **Central plant.** A “central plant” means that heating and cooling occurs from one location, not from a distributed system of boilers and chillers. Centralizing a plant allows for many engineering efficiencies.
- **Condensing boilers.** A condensing boiler is a high efficiency modern boiler that reclaims heat from hot exhaust gases to pre-heat the water in the boiler system. Condensing boilers, which are not used in conventional construction in the United States, are so efficient that almost no heat comes out the flue. Efficiency reaches 95%, as opposed to 85% for standard natural gas boilers.
- **Energy Management System (EMS).** Efficient mechanical systems are useless without accurate controls. A comprehensive EMS is a computerized system that lets building operators control temperatures, lighting, and other aspects of a building’s energy demands. Such systems can save enormous amounts of energy over more conventional control methods.
- **Efficient lighting and lighting controls.** Designers will use efficient lighting and lighting controls (such as occupancy sensors) to reduce energy use. The 800-space underground garage, where lights are on all the time, will be a cutting edge example of efficient lighting. Standard industry practice in parking garages is the use of high wattage (2-400w) metal halide or mercury vapor lamps, which use an enormous amount of energy. We have specified super-efficient 32 watt T8 fluorescent lighting for the garage, a major break from “business as usual.” Similar lighting at Aspen Skiing Company’s Little Nell hotel is saving upwards of 60% in energy use over standard bulbs.
- **Waste heat recapture.** Mechanical systems sometimes have to “dump” excess heat from the system. Unless recaptured, this heat is simply wasted. The central plant heating system is designed to use waste heat to preheat incoming air, further reducing energy needs.
- **High-efficiency fan coils.** Heat and “coolth” from the central plant will be distributed through the rooms in the village using a “fan coil” system. Fan coils are small fans that blow air over coils with hot or cool liquid in them. We have specified high-efficiency fan coil units which are several times more efficient than the industry standard.

Habitat and Wildlife

Wildlife and habitat issues are being addressed by an independent consulting firm that will oversee the rehabilitation of a half-mile section of Brush Creek, a watercourse that has consistently degraded over the past 30 years. The comprehensive rehabilitation and

¹ See Wilson, A., J. Uncapher, L. McManigal, L.H. Lovins, M. Cureton, and W.D. Browning. 1998. Green Development: Integrating Ecology and Real Estate. New York: John Wiley and Sons. Pp. 308-313.

stormwater management plan will improve fish habitat, reduce siltation and erosion, and improve access to the stream for humans and wildlife.

Water

It is not commonly understood that since 1992, high-efficiency fixtures (primarily toilets, urinals, and showerheads) have been required by law. The challenge for this development is to exceed building codes while still providing function and service to guests. The partnership is exploring the use of dual-flush toilets and waterless urinals. Dual flush toilets exceed code by providing two flushing options: 1 gallon and 1.6 gallons.

Waterless urinals don't require flushing mechanisms and therefore use no water at all, as opposed to standard urinals, which use 1 gallon per flush. While we have not committed to using these fixtures, we are currently testing a dual flush toilet at the Snowmass Golf Clubhouse, and are exploring waterless urinal options that don't have the smell and maintenance problems of first generation models.

Innovative Design Techniques Explored but Not Pursued

Cogeneration. Intrawest did extensive research into the possibility for “cogeneration” at Snowmass. Cogeneration systems use natural gas to run electricity generators while also creating heat for the village. Such dual use of fuel is highly efficient. A cogeneration system was attractive because it would have eliminated the need for the town of Snowmass to bring in new power lines for anticipated growth over the next ten years, above and beyond the base village. Unfortunately, analysis showed that cogeneration was exorbitantly expensive. The partnership felt it was more sensible to direct funds towards the types of measures described above, rather than direct it all towards cogeneration.

Building-integrated photovoltaics. In researching renewable energy options for the village, Aspen Skiing Company's Environmental Affairs Department explored the potential use of solar panels that would be integrated into building roofs. Again, this approach to renewable energy proved vastly more expensive than other methods. Other opportunities to provide renewable energy—such as microhydroelectric systems on the nearby ski hill—are currently being implemented at a much lower cost/benefit ratio. Numerous opportunities for such systems exist in Snowmass.