

## The Outsize Benefits of Solar on Roofs and Shade Canopies

Together We Build, March 8, 2023

By Thomas Beck, AIA, NCARB

Roofs that generate power? Shade canopies in parking lots moderate heat islands, so why not multiply their value by making them generate solar energy as well? According to a recent seminar we attended, Denver, Colorado, has the second largest heat island in the USA. As we pave over more of our natural environment for roads, homes and commercial complexes the effect is an increase in temperature and a loss of permeable soil. While here in Estes Park we have an abundance of natural surroundings, we also have large swaths of asphalt and rooftops generating heat islands while not generating electricity. This seems like a giant missed opportunity.

Think about roofs in Estes Park. The Rooftop rodeo, Event Center and Pavilion, school roofs and parking lots, Community Center parking lot and roof, Town Hall parking lot and roof, parking garage roof, and the Visitor's Center roof, parking and shuttle areas. Every shuttle stop in town should have a shelter with solar panels. Commercial parking lots like Upper and Lower Stanley Village could certainly sustain solar shade canopies and their large square footage of roofline enrolled in generating power.

Take for example the parking area for the Rooftop Rodeo and Events Center Complex. If the Town were to install photovoltaic panels combined as shade structures happy tourists could park on the much cooler asphalt surfaces and the solar panels would generate power. How much power? At Jack's Solar Garden in Longmont their 5 acres of 3,200 solar panels generates 1.2MW, enough to power 300 homes. Jack's is a great example of Agrivoltaics, a good topic for another day. It is also an example of how the installation of ground solar is being reconsidered when such copious quantities of parking lot and roof space areas are "on land that's already been stripped of much of its biological value" as concisely stated by Richard Conniff, Nov 22, 2021, in Yale Environment 360 (E360) "Why Putting Solar Canopies on Parking Lots is a Smart Green Move." The article is a cornucopia of examples of what existed in 2021, and possible futures. For example, if Walmart converted all 3,571 of its 5-acre parking lots to 3MW solar arrays, the total capacity would be 11.1 gigawatts of solar power "roughly equivalent to a dozen large coal-fired power plants."

The January 2022 Estes Park Environmental Sustainability Task Force report mentions the potential of the closed landfill site on Elm Road. (page 5). It predicts that a solar array in that area would generate enough power for 100 homes. That report also stated that "75% of residential structures in Estes Park may be suitable for solar energy generation. As of Nov. 10, 2021 only 1.47% of electric services in the Estes Park Power and Communications service area had solar or wind net-metered systems." As of that same date in 2021 "there were only eight commercial net-metered systems in the area serviced by Estes Park Power and Communications. This is a small fraction of the many businesses that could benefit from cleaner, less expensive energy, along with associated good will of customers."

If the town were to offer incentives for businesses to install solar it would help jumpstart the process. Just because we have no mega-parking lots like Walmart's does not mean we should ignore the potential for roof and shade canopy power generation to reduce our town's carbon footprint.

When the town installs rooftop solar and parking canopy solar in our very visible municipal lots it will send a clear message to our 5 million annual visitors that our tourist town cares about the environment and is serious about becoming part of the solution to the climate crisis. It will be good for us locals, good for our visitors, good for our local wildlife and habitat, and good for our planet.

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Beck, Thomas W. “The Outsize Benefits of Solar on Roofs and Shade Canopies” *Estes Park Trail Gazette*, Friday March 10, 2023, <https://www.eptail.com/2023/03/10/the-outsize-benefits-of-solar-on-roofs-and-shade-canopies/>