

CHANGING PERSPECTIVES: Crescent Dunes Solar • Photographs by Jamey Stillings
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Artist Statement

The aerial and ground-based photography I shot of SolarReserve's Crescent Dunes Solar concentrated solar power plant in 2014 and 2015 are part of a long-term documentation of global renewable energy development under the working title of *CHANGING PERSPECTIVES: Renewable Energy and the Shifting Human Landscape*. *CHANGING PERSPECTIVES* focuses on our attempts to find sustainable renewable energy solutions to our energy needs that will help humankind mitigate, and, hopefully, reverse the negative impacts of human-caused global climate change.

The first chapter of this ongoing project began in late 2010 with a brief flight over the future site of Ivanpah Solar in the Mojave Desert, straddling the California/Nevada border. This four-year documentation of the Ivanpah Solar 392MW tower-style concentrated solar power plant, from before construction began until it produced electricity for the California grid, became a photographic exhibition, a book *The Evolution of Ivanpah Solar* (Steidl, 2015), and has been editorially published internationally more than twenty times. (Note: An archive of this work is in the UNLV collection.)

My particular interest in the Crescent Dunes Solar 110MW tower-style concentrated solar project was in the molten salt storage technology integrated into the plant's function. Intermittency is one of the great challenges of solar and wind renewable energy projects. Wind turbines produce electricity only when there is wind, usually early and late in the day. Photovoltaic plants produce electricity only when there is sunshine. Ivanpah Solar and related parabolic-style concentrated solar plants without storage also produce electricity only when the sun shines.

What makes Crescent Dunes Solar distinct is molten salt storage. Two tanks of molten salt sit at the base of the plant's 640-foot (195-meter) tower. From one tank "cold" salt, approximately 550°F (288°C), is pumped up the tower to a receiver that absorbs the sun's thermal energy via 10,347 heliostats (mirror grids) and heats the salt to 1050°F (566°C). This "hot" salt is then pumped back down to the second tank. Using heat transfer technology, the thermal energy is used to super heat water to create steam, driving steam turbines to create electricity on demand. The large tank of "hot" salt is able to store the sun's thermal energy and then utilize it to produce electricity day or night. Thus, Crescent Dunes Solar has the capability to deliver electricity to the Nevada grid 24/7.

Crescent Dunes Solar has encountered fewer environmental challenges than its cousin, the Ivanpah Solar project. The most significant issue is minimizing and mitigating avian mortality at the plant. The sun's thermal energy reflected by thousands of heliostats

toward the black target at the top of the tower can be lethal to birds and insects flying too close to the tower. The plant continues to research and deploy a variety of techniques to keep avian mortality to a minimum. It is important to keep site-specific avian mortality in context with other sources of human-caused bird deaths. Studies indicate that avian mortality from fossil fuels per GW hour of electricity produced are much higher than for any type of solar or wind power generation. And the largest number of human-caused bird deaths each year comes from birds impacting windows on buildings and houses.

In looking at the body of photography within the Crescent Dunes Solar - Digital Archive, you will see my interest in blending aesthetic and documentary sensibilities. I am fascinated to understand and interpret how the power plant fits within the desert landscape northwest of Tonopah, Nevada. I am interested in how the plant functions and want to help viewers understand its processes. But, I am also interested in a purely aesthetic exploration of the plant itself and the plant within the landscape. You will see this most distinctly in the great number of abstract photographs created within confined fields of heliostats reflecting the infinite variety of blue tone samples from unique swatches of the sky above.

At the end of 2018, through *CHANGING PERSPECTIVES: Renewable Energy and the Shifting Human Landscape*, I have photographed throughout the American West, in Japan, Uruguay and Chile. My goal in the coming years is to build this multi-chaptered work into a fully global project that may serve both as an active contemporary look at renewable energy development and become an historical archive of our progress, or lack thereof, during this era on Earth.

Jamey Stillings, May 2019