

Roth: Pioneers take solar-powered airplane around the globe

By [Jim Roth](#), Director and Chair of the Firm's Clean Energy Practice Group. This column was [originally published in The Journal Record](#) on June 6, 2016.



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The Solar Impulse project was co-founded by Bertrand Piccard and André Borschberg. These two pioneers are currently piloting the Solar Impulse 2, a solar-powered airplane, on a trip around the world.

The Si2's trip around the world began in Abu Dhabi in 2015.

There are 16 scheduled legs on its journey, and the team completed the 13th leg on Wednesday when it landed at Leigh Valley International Airport in Pennsylvania.

The Si2 is powered exclusively by the sun's energy, which is converted by the aircraft's 17,248 solar cells. These cells fuel the plane during the day. Excess energy that is not used to propel the aircraft is sent to the lithium polymer batteries that are housed with the four engines. The Si2 relies on energy stored in the batteries for power during low-light hours and overnight.

The Si2 is lightweight, has a lower power consumption, and has a wide wingspan. In fact, it weighs about as much as a family car, has the power of a small motorcycle, and has a wider wingspan than a Boeing 747. The lightweight design, coupled with the wingspan, allows the Si2 to travel long distances and consume minimal amounts of energy. One problem with the low weight is that the aircraft is vulnerable to turbulence. The Si2 was recently parked [in Tulsa](#) for a week while the team waited for a break from high wind speeds.

The Si2's entire design and flight plan were built around energy efficiency. For example, one strategy to conserve energy is to ascend to 8,500 meters during the day and descend to 1,500 meters at night. A typical day of the Si2's trip around the world begins with the plane taking off at sunrise. The four propellers run at full power using the sun's energy, and the aircraft climbs to its maximum altitude. As the sun begins to set, the engines are throttled down and the aircraft descends to 1,500 meters over the course of several hours. At approximately 10 p.m., the engines are powered up again using the energy stored in the batteries. The Si2 will fly through the night on battery power. A new cycle begins at sunrise, when the solar cells resume fueling the aircraft and charging the batteries.

Piccard and Borschberg believe that renewable energy

technologies and energy efficiency are the keys to reducing emissions and improving our quality of life. The Solar Impulse project aims to promote clean energy and its potential to fuel technological innovation. Many of the clean technologies developed for the Solar Impulse project have already been patented and are used in our everyday lives, including electric motors, batteries, and LED lighting. Piccard and Borschberg hope that their project will continue to encourage innovation and sustainable development, in the air and on the ground.

And that's worth exploring, especially as we Americans stand in long lines through airport security screenings for endless hours this summer travel season.

Jim Roth, a former Oklahoma corporation commissioner, is an attorney with [Phillips Murrah PC](#) in Oklahoma City, where his practice focuses on clean, green energy for Oklahoma.