



**Introduction:** The newly built hotel at the Sunset Boulevard interchange of Interstate Highway 26 in Columbia is a LEED certified building. LEED - Leadership in Energy and Environmental Design - is a voluntary standard that acknowledges energy efficiency, environmental responsibility and occupants' health and comfort.

**Background:** Ms. Hema Patel and Mr. Steve Patel, the hotel's owners are strong believers that the future of the hospitality industry belongs to properties like this one, built sensibly and with long term sustainability in mind.

Mr. & Ms Patel own several properties, among which was an aging hotel at this location which was demolished. As a component of the LEED design, Columbia-based Real Value - an EnerWorks partner company - was contacted to provide a turn-key solar water heating system.

**Aims & Objectives:** The LEED system for new construction awards points for attaining various goals in the building design. A minimum number of points has to be obtained for the certification. The design team has the flexibility to choose what set of features/goals to apply for. Solar water heating technology has the potential to bring up to 4 LEED points for a project.

**Approach:** EnerWorks has proposed a system that incorporates 20 Premier flat plate type collectors along with one 40 kW Solar Energy Terminal and related accessories. A simulation with Polysun software shows that 87.8% of the yearly water heating needs of this hotel are covered by energy from the sun. A heat meter was included to allow later on a comparison between long term real-life output and the computer simulation. EnerWorks started working with the design team in February 2009. The hotel was built in the second part of 2009 and fully commissioned in April 2010. EnerWorks has assisted with the commissioning of the solar system and with the application for LEED points.

**Challenges:** In order to take energy efficiency even further, the mechanical designer has specified a battery of Rinnai on-demand water heaters as back-up for the solar system. The conventional approach is to use tank-boiler type systems but those have significant stand-by heat losses which the engineer wanted to eliminate. Late in the design stage a flag was raised that - as originally designed - the combined solar+on-demand system is not completely safe from bacterial growth, particularly Legionella. Through a joint effort, the local engineer, Rinnai and EnerWorks representatives have come up with a solution that eliminates any concerns. However, additional equipment required space in the mechanical room that was simply not available. A portion of a nearby storage room had to be re-allocated for the additional mechanical equipment and piping. In hindsight it is evident that an earlier involvement in the design from Rinnai and EnerWorks could have saved a lot of headaches.

**Successes:** The solar+on-demand heater combination used on this project is - to our best knowledge - unique and a first for commercial scale buildings. This created the opportunity to apply for an extra LEED point which is only available for innovative technical solutions. LEED points are hard to earn and this was a pleasant surprise.

**Conclusion:** The system has been operating very well since its commissioning:

*"Our on-demand gas heaters hardly ever have to fire, and I've never seen more than 3 of them being on at any given time"*

says Ms. Patel, meaning that the solar component indeed covers most of the water heating load, as designed.

