

Denver Regional Council of Governments: Solar Map Project

Denver, CO

Population: 2.8 million

Size: 5,288 square miles

www.drcog.org

303.455.1000

Since 1955, the Denver Regional Council of Governments (DRCOG) has served as a voluntary association of local governments and a voice for regionalism in the nine-county Denver, Colorado region. DRCOG serves as the region's planning commission, metropolitan planning organization (MPO) and area agency on aging (AAA), and also fosters cooperation among local governments for other regional needs related to the environment, data, growth, development and many more issues that cross jurisdictional boundaries.

DRCOG and Solar

In December 2009, DRCOG received a New Energy Economic Development grant from the Colorado Governor's Energy Office to develop a solar map that provides information on a given rooftop's solar capacity and simultaneously connects residents and businesses with installers who could help them capitalize on that capacity. Where detailed building data was available, the interactive solar map analyzed the roof space (without significant obstructions) and solar orientation of commercial and residential buildings in the 56 cities, towns and counties represented by DRCOG. This data was then translated into an easy-to-understand calculation, providing residents and business owners with an accurate assessment of their building's potential for solar photovoltaic (PV) installation. The project started out with a focus on commercial buildings, but expanded to include residential buildings.

The solar map, which supports the sustainability aspects of DRCOG's Metro Vision 2035 plan

and the achievement of Colorado's Renewable Portfolio Standard, was created with support from a public/private partnership with Woolpert Inc. (Dayton, Ohio) and the Colorado Solar Energy Industries Association (COSEIA) (Boulder, Colorado) in an effort to more easily link building owners with solar installers that would have the potential to create jobs, stimulate the economy and encourage broader solar energy adoption. Both partners were key in the project development and implementation process – Woolpert provided the technical knowledge that existing data could be used to create the map, and COSEIA provided rooftop solar potential information more specific and tailored to the Denver region than material publicly available from sources like the U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL).

The result is a user-friendly map with a simple interface that requires no training. When a user types in an address or zooms in to a building on the map, the first information displayed is a month-by-month estimate of the power generation capacity in kilowatts if a solar PV system were installed on all available roof area for that address. If a user clicks "Next," he or she will see estimated electric bill savings, as well as related information about the

estimated system sizes and available incentives. Clicking "Next" again leads the user to a contact form where the user can input his or her name, contact information and a few preferences so that an area solar installer may contact the user directly to provide a personalized estimate with detailed incentive opportunities. The information submitted is

DRCOG is proud of the solar map project, and it really helps supplement our very successful ongoing regional data efforts. Residents, businesses, and other organizations now have access to this very useful tool, and we've received a lot of positive feedback. The project itself aligns perfectly with the goals set forth in our long-range Metro Vision plan, which emphasizes sustainability and more broadly making life better in the Denver region.

– Jennifer Schaufele, Executive Director,
Denver Regional Council of Governments

then passed on to regional solar installers who have access to the solar map and more detailed data provided by DRCOG and its partners.

For a map like DRCOG's, several key datasets are essential, including high-resolution digital orthophotography for feature and building identification, Light Detection and Ranging data (LiDAR) to quickly identify obstructions on rooftops that could inhibit PV panel placement, and building footprints and parcels (property ownership) for areas where LiDAR does not exist. DRCOG and its partners created the map using data from its ongoing *Denver Regional Aerial Photography Project* (DRAPP) and Denver Regional Data Consortium which fosters regional data development and is used for transportation, parcel, land use and zoning, among others. Using LiDAR, Woolpert built a web-based computer program that analyzes the roof space and solar orientation of commercial and residential buildings throughout the DRCOG region. In addition, some federally and locally funded LiDAR data created when Denver hosted the Democratic National Convention in 2008 was leveraged for this project. Finally, local governments coordinated with DRCOG and Woolpert to provide building footprints for areas without LiDAR data. This fit in well with DRCOG's on-going efforts to collect similar data from its members, as this information is used to support other long-range planning, transportation and land use modeling efforts.

After collecting the data and beginning to build the map, DRCOG worked closely with COSEIA to develop solar power generation estimates specifically for the Denver region. Beyond these estimates, the team also identified estimates of PV system size for given buildings and projected electric bill savings estimates.

The datasets from DRCOG's member governments and region-specific information from COSEIA were then loaded into DRCOG's enterprise Geographic

Information System (GIS) database. Each time a user accessed the Google Maps Application Programming Interface (API) or Solar Map interface to look up their address or click on a building, a query is sent to DRCOG's database and a custom calculation is performed on-the-fly and the information is sent back to the user via the Google Maps interface. After identifying a building of interest, users can access the information described above. In the map's first month of activity, there were nearly 8,000 unique visitors. Within the first two months of the map's release, 14 leads were generated for solar installers from the online form. Both measurements are important indicators of how the map is educating the public about solar information. DRCOG is currently working on measuring the data created by the site, specifically job creation numbers. DRCOG is developing partnerships to continue efforts to educate the public about how the site helps residents and business owners connect with local solar providers.

Lessons Learned

DRCOG and its partners identified several areas where their experiences could help inform other regional planning organizations developing similar mapping projects:

- Partnerships are critical for success - both technical partnerships (LiDAR data processing, database, map design and maintenance) and with solar installers (provide accurate solar PV potential estimates);
- Effectively maximizing available data and tools, results in cost savings, a familiar user interface and an easy to update back-end system; and
- Recognize the need for continuing funding or partnerships that can market and maximize the number of end users, resulting in larger impacts on the growth of the solar PV industry within their region.

