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Concentrating Solar Thermal Power: Clean Energy for the United States

In the Southwest United States, an enormous solar energy resource remains largely untapped. There is already more than 500 MW of concentrating solar thermal power in the United States and Spain primarily, but there is significant scope to scale up development. As Congress oversees the nation's transition to a clean energy economy, a homegrown renewable energy technology — concentrating solar thermal power — can help cut emissions and enhance energy security with American resources.

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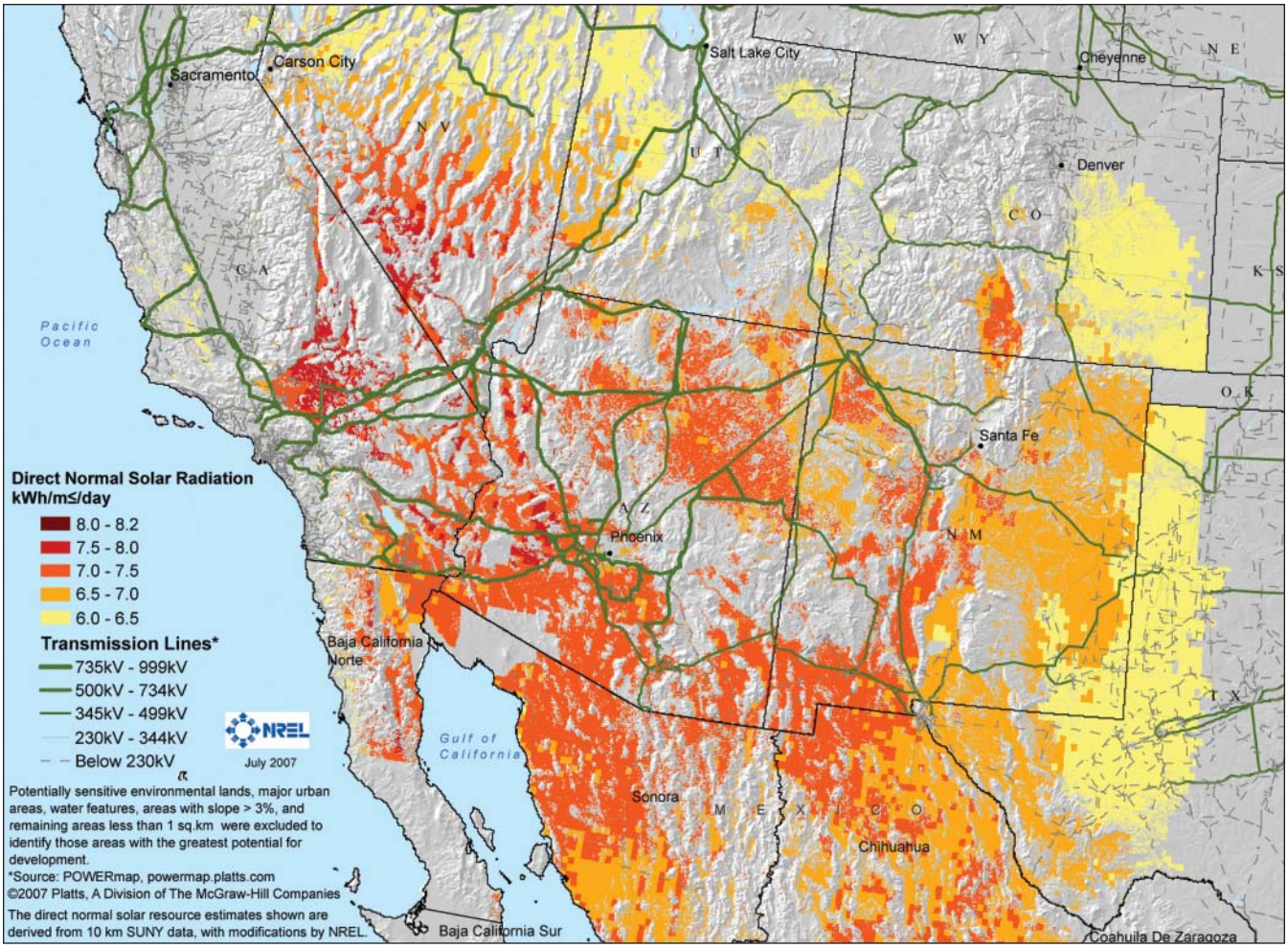
Concentrating solar thermal (CST) technology uses reflective material to concentrate the sun's rays to power steam turbines or engines. When combined with thermal energy storage—which enables a plant to produce power under cloud cover and after the sun has set—CST can generate electricity on demand, not just when the sun is shining. This makes CST different from many other renewable power sources. While many renewables provide power intermittently, CST with thermal energy storage can provide around-the-clock power, potentially offering a low-carbon solution to baseload power demand.

CST, which can provide power without increasing carbon dioxide emissions, will be an important part of the energy solution in the United States. Congress can enact legislation that will facilitate bringing it to scale. Below are specific recommendations for how Congress can help the country take advantage of CST:

- **Enact a price on carbon**. CST currently is more expensive than coal and other fossil fuel sources. Because CST is a low-carbon technology, enacting a carbon price would help the technology compete with conventional sources. Cap-and-trade is one mechanism for developing a carbon price.
- **Fund RD&D**. Research, development, and demonstration support will facilitate cost reductions of materials and systems, including thermal energy storage, which can bring down costs to make CST competitive with conventional sources of baseload power.
- **Create a national Renewable Energy Standard (RES).** Currently, some states with RES have a solar "carve out," or a percentage set aside that must come specifically from solar. These policies have accelerated deployment of CST in those states and increased utility confidence in the technology. A national RES, including a mandate for solar, would send a market signal to invest in renewables such as CST.
- **Push for CST in international technology partnerships.** China, India, and countries in the Middle East and North Africa have great potential for CST. As a promising option to reduce GHG emissions and improve energy security, CST should be a priority in international collaboration on RD&D issues. For instance, the World

FIGURE 1. CONCENTRATING SOLAR POWER PROSPECTS OF THE SOUTHWEST UNITED STATES



Source: NREL

Bank's Clean Technology Fund includes a program dedicated to deploying concentrating solar thermal power.

- **Improve the grid and transmission system.** Greater federal oversight of the electricity grid and/or improved coordination between grid operators will help bring CST power from the country's prime CST areas, the Southwest (see Figure 1) to a broader area.
- **Consider alternative investment incentives.** While tax credits such as the 2008 Investment Tax Credit extension are important, they are subject to periodic and uncertain renewal, which presents a challenge to investors. Moreover, in the current economy, tax-based incentives may not be as accessible to project developers as they have been in the past. Incentives such as feed-in tariffs, widely used in Europe, require utilities to pay renewable energy generators a fixed, above-wholesale price for the power they produce. Thus, feed-in tariffs directly raise the price paid for renewable generation and guarantees it a buyer over a period of time – a more stable signal to investors.

For more on this topic, please read WRI's new report, *Juice from Concentrate: Reducing Emissions with Concentrating Solar Thermal Power.* Available online at http://www.wri.org/publication/juice-from-concentrate or contact Rob Bradley (rbradley@wri.org).