



# The Future of Solar

background

Diagram of a CdTe solar cell removed due to copyright restrictions.

**Solar Energy is becoming an attractive option for electricity generation**

- National Security
- Environmental Concerns



issues

Graph of solar UVB irradiance, Georgetown, TX removed due to copyright restrictions.

- Solar panels only generate electricity during the day.
- Requires significant government subsidies to maintain competitiveness
- Need for inverters and smart grids



## ANALYSES:

Use solar panels to address peak load electricity generation

- Solar energy can cost less than electricity from natural gas peaker turbines
- We will implement a combination of grid-connected solar farms and local roof-top installations

## HOW IT WORKS (MODELS):

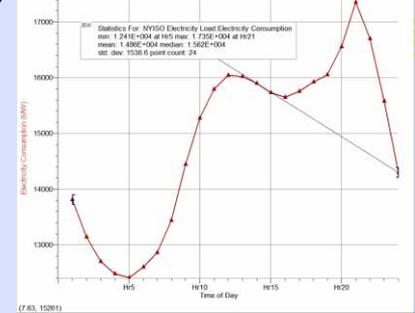
A natural gas peaker turbine costs \$577/kW. Running 1 kW for 8 hours a day over 30 years and including a \$0.013/kWh cost for fuel, natural gas costs \$0.0196/kWh of wholesale electricity.

In comparison, solar panels cost ~\$300/kW and cost \$0.0137/kWh of wholesale electricity

## ASSUMPTIONS AND LIMITATIONS:

- \$3 per installed watt cost for thin-film solar panels
- Assuming normalized average of 4 hours of intense sunlight per day.
- Panel lifetime of 15 years
- Taking into account that 20,000 square km of brownfields are utilizable for solar farms, as well as large rooftop availability, land area will not be a limiting factor.

consequences



- Implementing solar will increase electricity costs in the near term
- Need for back-up generation or storage



recommendations

**15% of Peak Capacity**

**Current target is 112,000 MW**  
Would account for about half the difference between the peak load capacity and base load capacity.

**As solar panel costs decrease and fossil fuel costs increase, solar will become an important part of U.S. electricity generation.**

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