





# Deploying Solar Energy to Combat Global Warming

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Solar Energy Industries Association



# Introduction to SEIA

- National trade association for solar energy
  - » Over 500 member companies
  - » Members include all solar technologies, manufacturers, installers, end users, financial and legal entities
  - » Represent over 20,000 people employed by solar
  - » 14 state and regional chapters
- Mission
  - To make solar energy a mainstream and significant energy source by expanding markets, strengthening the industry and educating the public on the benefits of solar energy



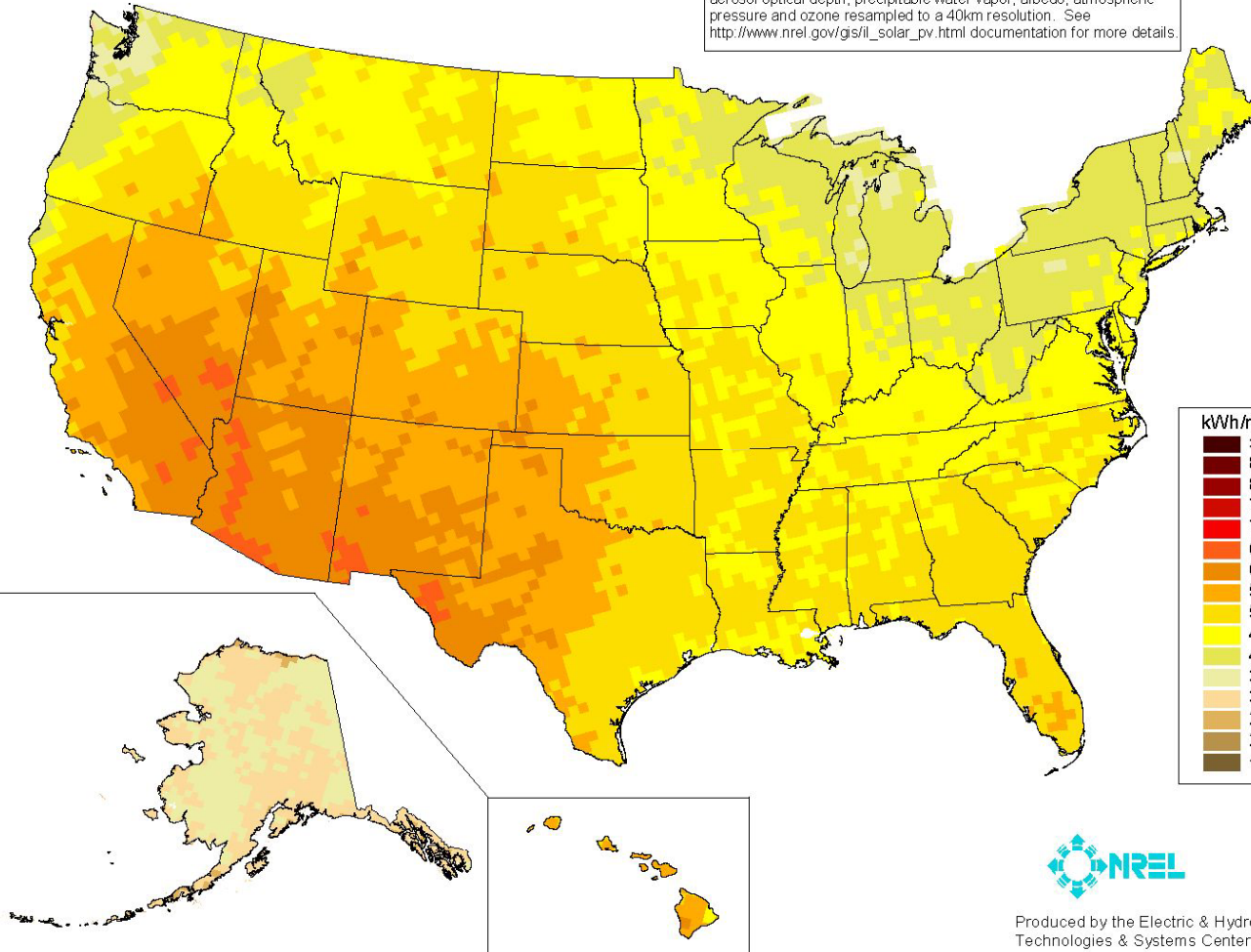


# U.S. Insolation

## PV Solar Radiation (Flat Plate, Facing South, Latitude Tilt)

Annual

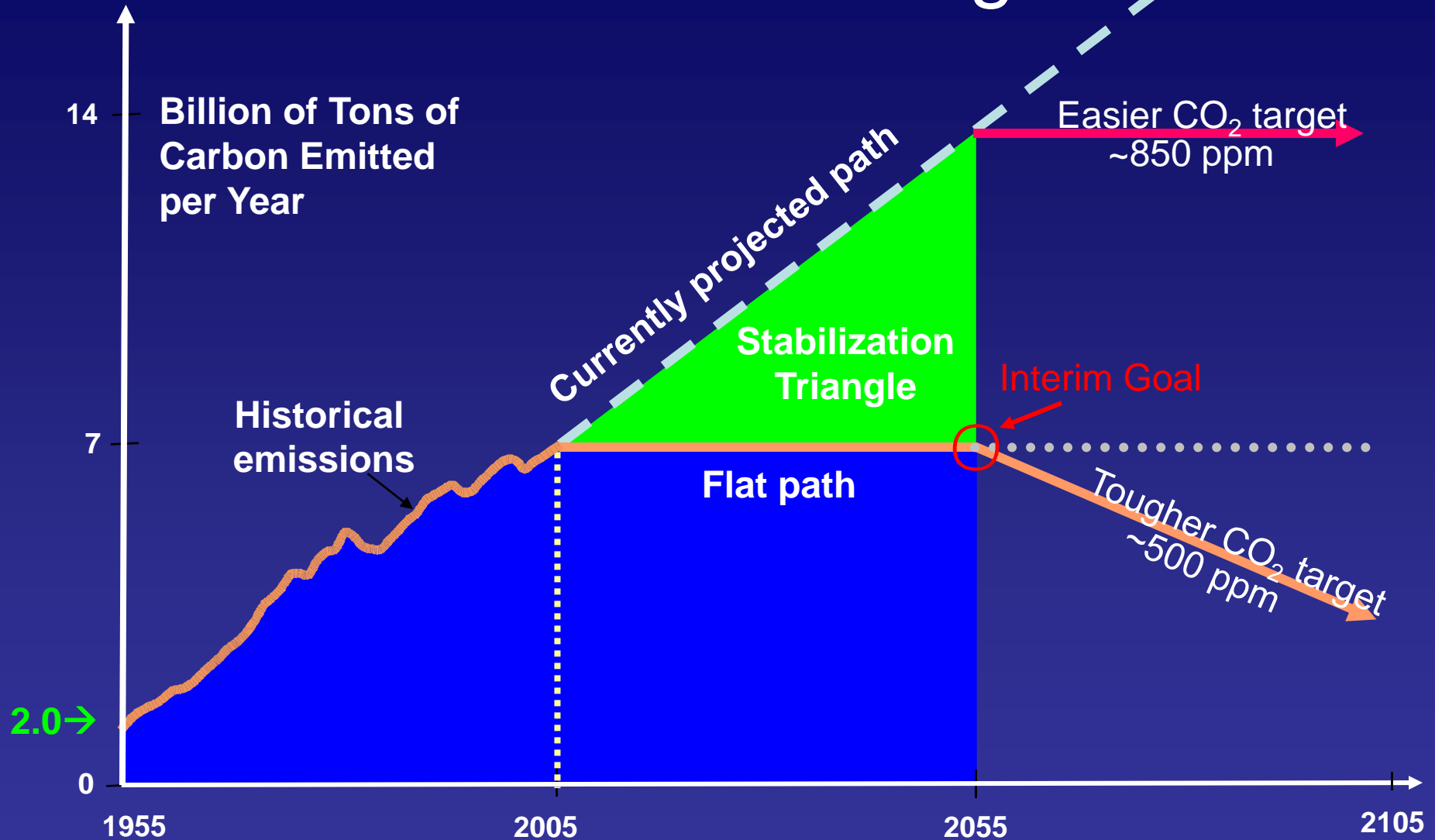
Model estimates of monthly average daily total radiation using inputs derived from satellite and/or surface observations of cloud cover, aerosol optical depth, precipitable water vapor, albedo, atmospheric pressure and ozone resampled to a 40km resolution. See [http://www.nrel.gov/gis/il\\_solar\\_pv.html](http://www.nrel.gov/gis/il_solar_pv.html) documentation for more details.



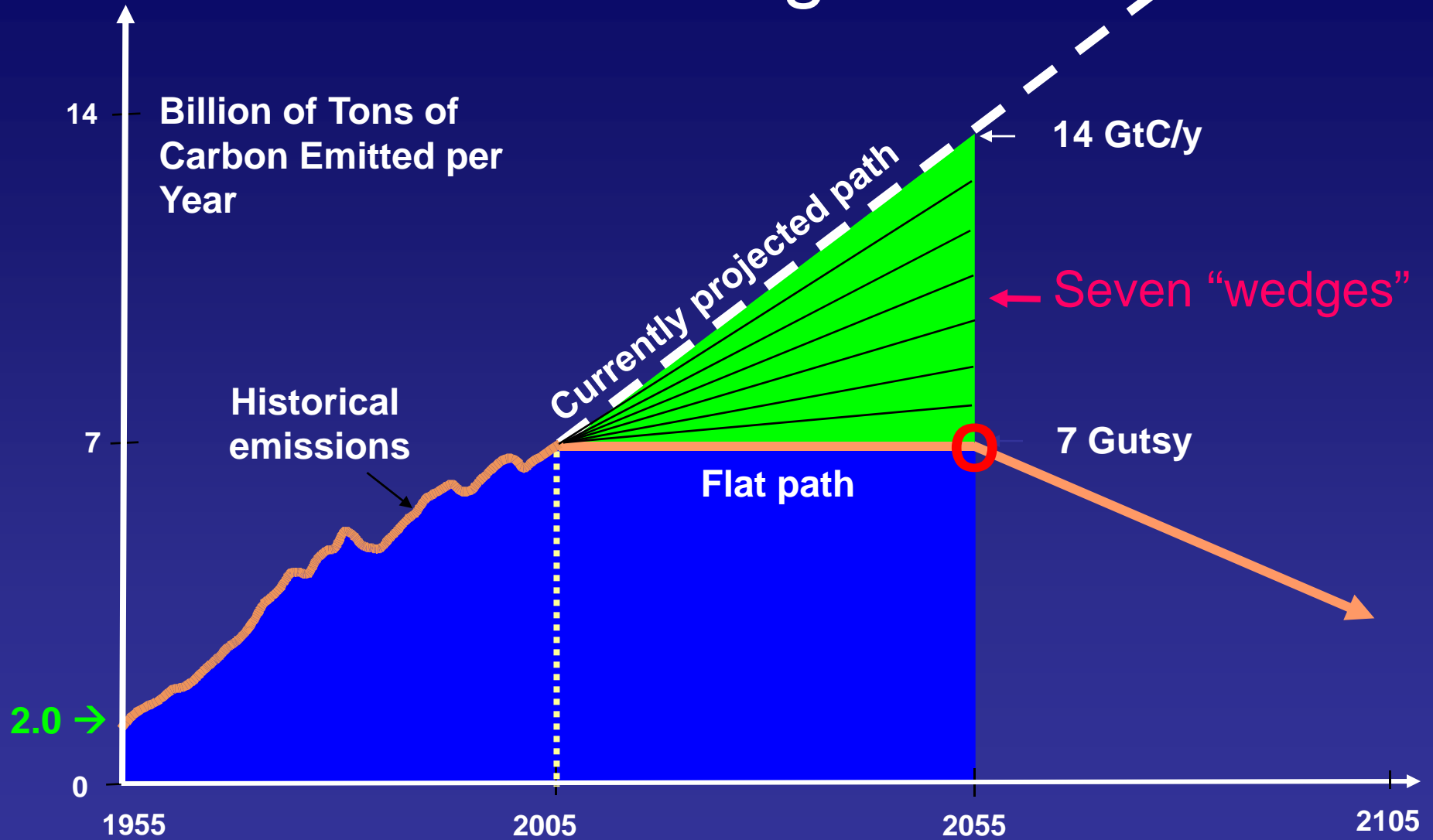
Produced by the Electric & Hydrogen  
Technologies & Systems Center - May 2004



# The Stabilization Triangle



# Wedges





# The Solar Wedge(s)



- Photovoltaics (PV)



- Concentrating Solar Power (CSP)



- Solar Heating & Cooling





# The PV Wedge



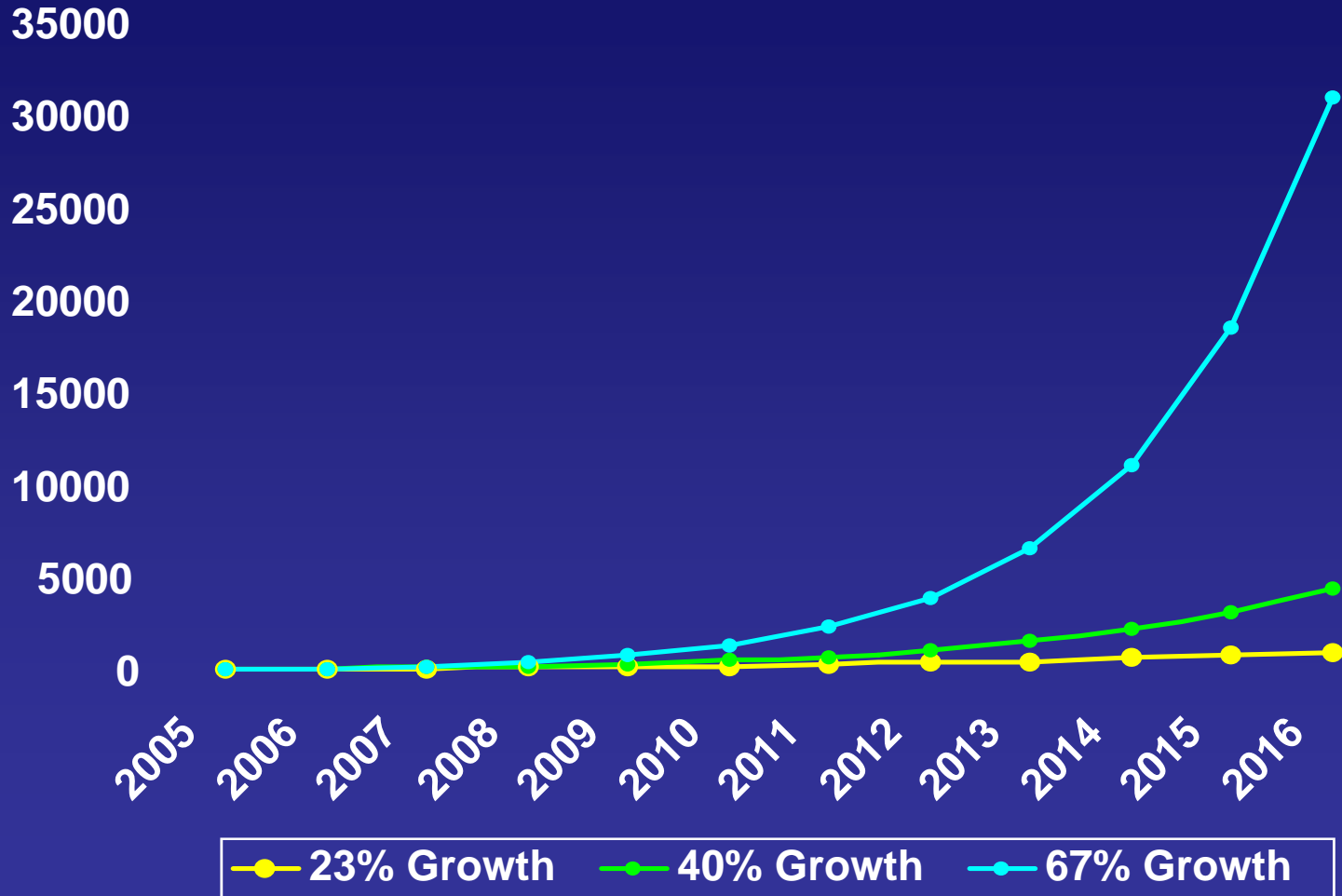
- 2005: Passage of 30% ITC
- 2006 & 2007: 45% annual growth in MW installed
- 2007 CA alone: deployment surpassed previous 20 years combined
- 8-year ITC = 67% + potential growth annually



# Forecasted Growth of PV in US



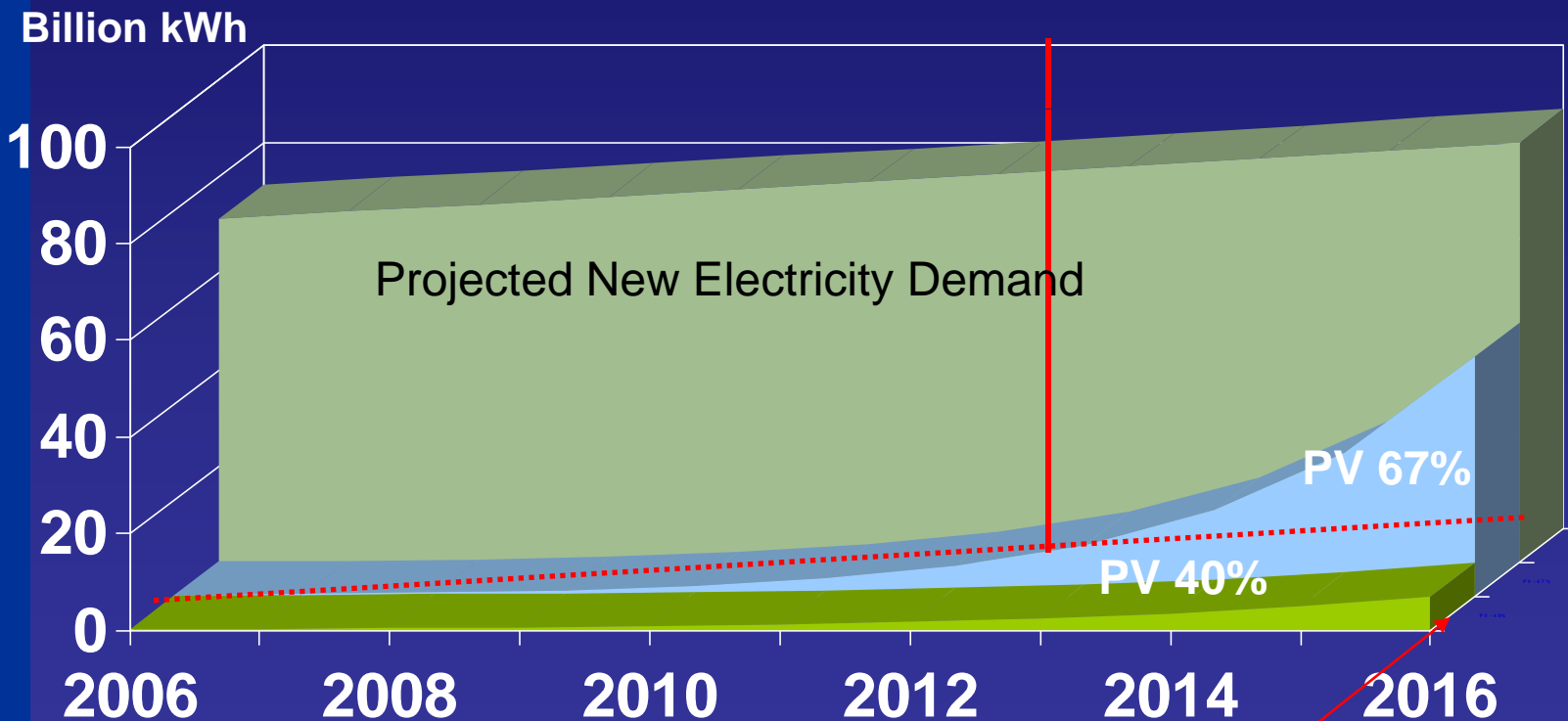
MW Installed Annually





# PV's Contribution to New Electricity

Solar reaches 15%  
8,000 MW/Yr



PV reaches 8%  
5,000 MW/Yr



# PV: Residential Retrofit - 6 kW





# PV: Moscone Center - SF CA - 675 kW



Source: SunPower

[www.seia.org](http://www.seia.org)



# The CSP Wedge



- 7,000 gigawatts of solar capacity exist in Southwest U.S.
- 64 MW deployed in NV in 2007
- Projects totaling 4 GW in pipeline by 2015
- 4 GW of CSP will meet approximately 7% of new electricity demand by 2015
- Projected cost of deployment equivalent to new natural gas by 2015
- Price equivalency to new gas generation forecasted to dramatically increase deployment



# CSP Dish System





# CSP – Trough System





# The Solar Thermal Wedge



- Heating and cooling accounts for about 20% final energy demand in U.S.



- Solar heating & cooling directly displaces natural gas & electricity

- Residential water heating accounts for 23% of residential natural gas use



- Residential water heating accounts for 8% of residential electricity use



- U.S. had 1.55 GW (thermal equivalent) of installed water heating capacity in 2005

- China has 55GW (thermal equivalent) of installed water heating today





# Solar Thermal Heating & Cooling





# How to Build a Solar Wedge



- Long-Term Solar Investment Tax Credit
- RES with Solar “Carve-Out” or set-aside
- Carbon Constraint Optimized for Solar Deployment
- Solar Roofs Program - \$3/watt – PV & 30% rebate for solar heating & cooling
- Guaranteed low-interest loans for solar property
- Zero-Carbon Preferred use for Federal Lands
- Renewable Energy Transmission Corridors
- Increased Solar Research & Development
- Solar Access Rights (e.g. national net metering)



# Carbon Legislation Needs



- Pending adoption of carbon constraint we can position our economy NOW for a carbon-smart future (ITC, RES with solar “set-aside”, etc.)
- Any carbon constraint must:
  - Provide auction proceeds
  - Provide new entrant set-aside allowances
  - Condition allowances and auction proceeds on adoption of solar best practices
  - Secure broad and consistent definition of solar
  - Promote participation of small energy systems
  - Credit investments in solar technology
  - Credit avoided emissions and water use



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