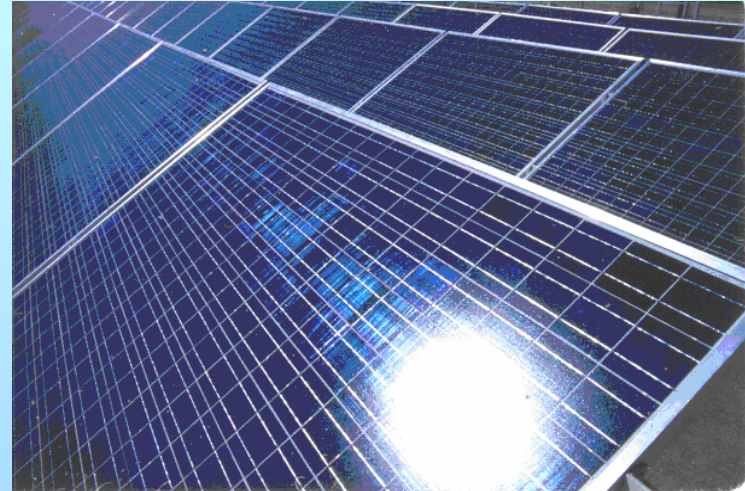


# Utilities + Solar Energy + U = Our Green Energy Future



# Critical Solar Success Factors:

- **Resource & Technology Factors**
- **Locational Attribute Factors**
- **Reliability and Production Factors**
- **Financing Concept Factors**
- **The U Factors**



# Resource & Technology:

## Solar Resources:

- **Arizona – Full electrical needs are met by 0.4% of land area.**
- **Pennsylvania – Only full electrical needs renewable energy resource.**

## Solar Technologies:

- **Modularity Factor**
- **Customer Sited Photovoltaic – PV**
- **Utility Scale PV**
- **Tracking Style PV**
- **Tracking Style Thermal Concentrator**
- **Tracking Style Engine Concentrator**
- **Central Tower**
- ***Different Capital and Operating Cost Factors***



# Locational Attributes:

- **Strong solar insolation resource.**
- **Cool average annual temperature.**
- **Windy when sun is shining.**
- **Terrain.**
- **Native vegetation.**
- **Climate Extremes.**
  
- *Differing climates & terrains favor specific solar technologies.*
- *No single silver bullet.*



# Reliability & Production (1):

- **2003 Annual Effective Availability: 99.78%**
- **2004 Annual Effective Availability: 99.72%**
  
- **2003 Actual Net AC Energy Production: 4,958 MWh**
- **2004 Actual Net AC Energy Production: 7,000 MWh**
- **2005 Forecast Net AC Energy Production: 7,750 MWh**

*We can predict the sun with  
100% accuracy.*

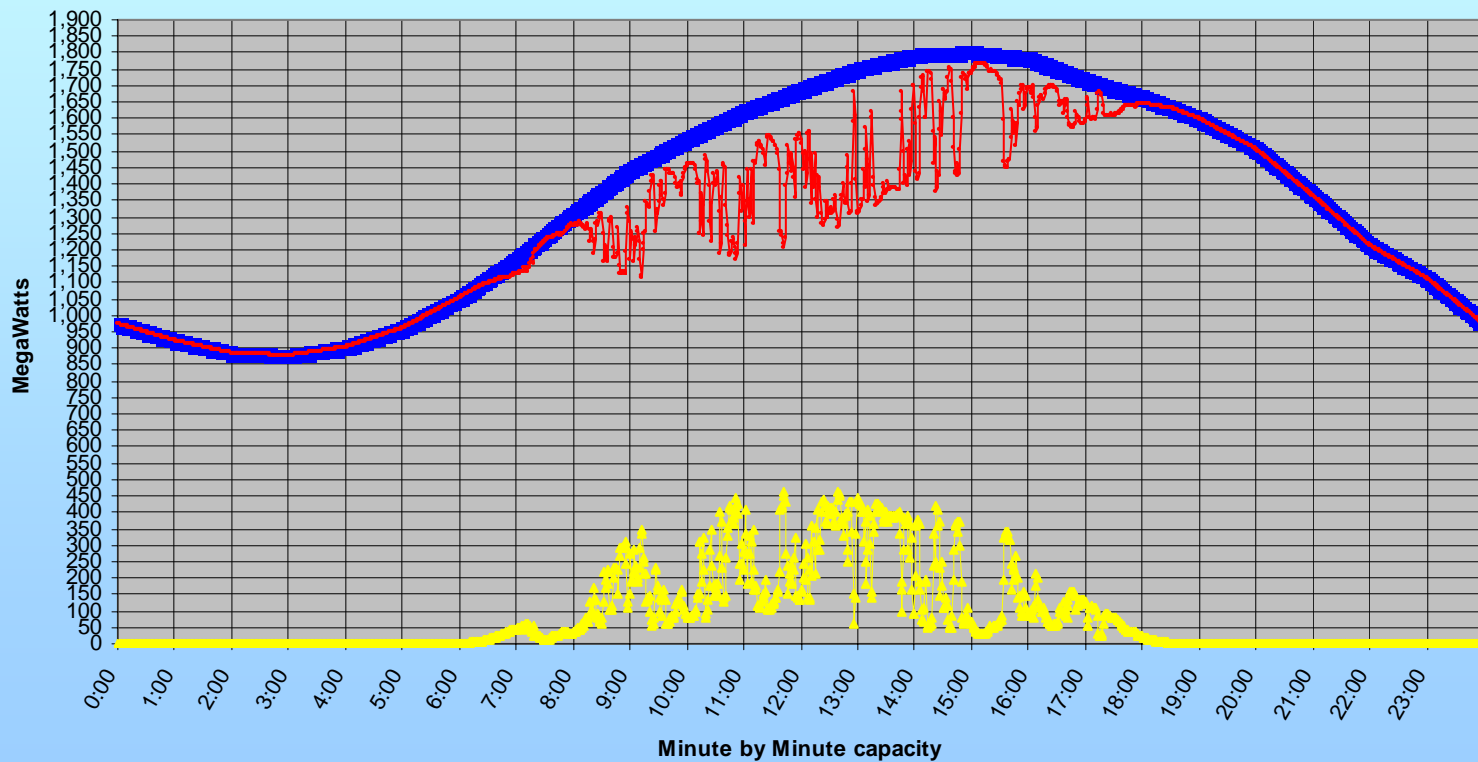
*We just need to predict clouds.*



# Reliability & Production (2):

## Intermittency Can be a Concern – Storage will be Needed

Sept 3, 2004 Solar Projection - 500 MW DC Installed Capacity



—▲— Solar Power in MW —■— Native Load in MW —●— Fueled Generation in MW



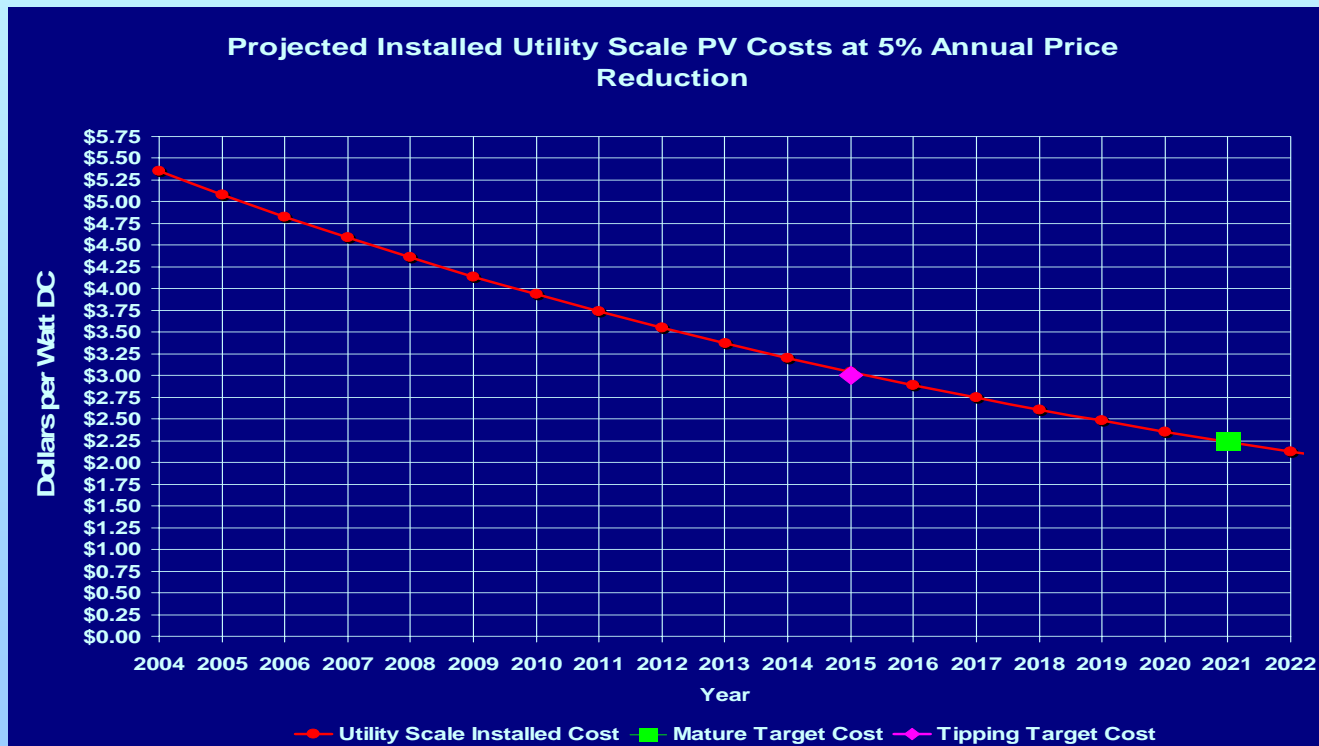
# Financial Concepts (1):

- **Up Front Financing - No finance charges - Provided by Arizona's current Environmental Portfolio Standard**
- **Federal 10% Investment Tax Credit**
- **Double Declining Balance Accelerated Depreciation**
- **NPV of Wholesale Energy Production Value for 30 Years**
  - No Fuel Expense
  - Very Low O&M Expenses
- **Arizona's Property Tax Structure**
- **NPV of Future Environmental Credit Value**
- *Solar - High Capital Cost / Low Operating Cost Generation*
- *Generation Financing Paradigm must be revised.*
  - *Use of financing appropriate for gas, nuclear or coal generation will develop more gas, nuclear and coal generation.*
  - *We must finance differently if we are to generate sustainably*

# Financial Concepts (2):

**Springerville 30 Year Average Levelized Cost of Production:  
\$0.096 / kWh**

**2004 Customer Rate Impact: < 1%**



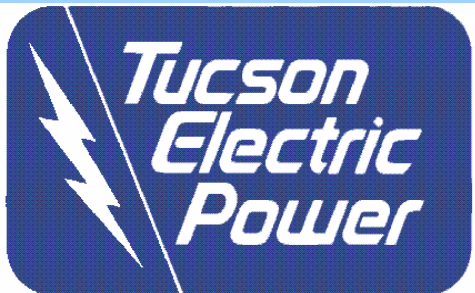
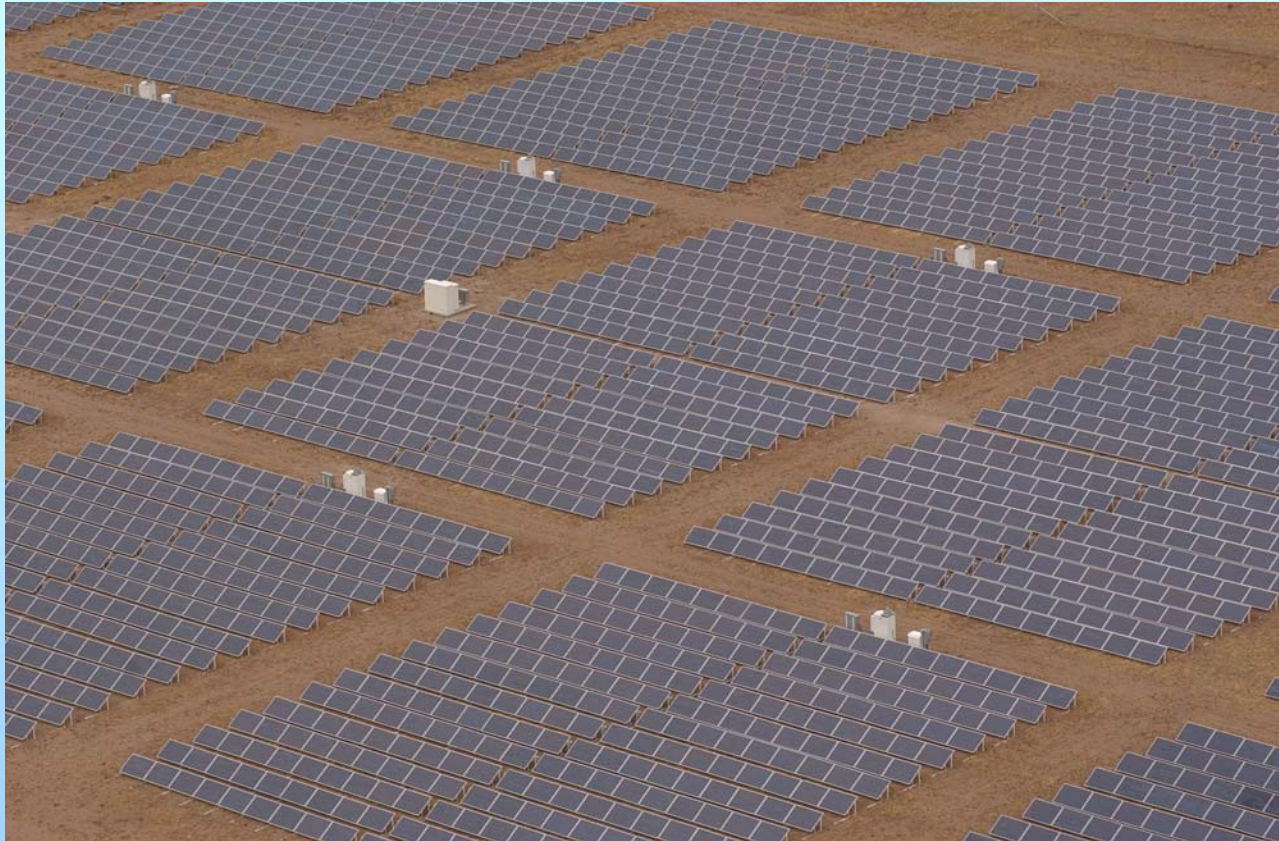
# The U Factors:

- **Support the sustainable Federal PV Roadmap Concepts.**
- **Provide sustainable incentives for Customer Sited Solar.**
- **Provide sustainable incentives for Utility Scale Solar.**
- **Develop sustainable & creative funding paradigms.**
- **Celebrate the Successes.**

*Be patient:  
Sustainability is all about time.*



# Questions:



Visit: [GreenWatts.com](http://GreenWatts.com)