

# Overview: Solar Energy as an Arizona Economic Priority

**The new solar context: Belief that over the next 20 years Arizona's extraordinary solar resource offers a natural competitive advantage and an opportunity for global leadership in a clean energy economy. SFAz's solar goals:**

- Improve solar's cost competitiveness/bankability
- Create new products that are easily scalable and best fit with the resource
- Catalyze new investment that connect sites with highest solar resource to high value regional and national markets
- Build an analysis capability that breaks down regional barriers, creates a small cadre of committed people, and facilitates decision making.

# **Solar Technology Initiative Operating Plan**

**Solar is integral to SFAz's effort to create a statewide collaborative economic engine creating new industries and expanding the state's revenue base.**

**It created the Solar Technology Initiative (STI) designed to:**

- Support solar technology innovation that links with industry interests
- Create decision tools that build on a common interest and advance deployment of solar energy
- Break down structural barriers between Arizona universities and industry
- Advance concentrating PV as a competitive grid option for Arizona and the desert southwest
- Increase the reliability and bankability of solar energy systems
- Create knowledge networks
- Insure supply of trained solar workers for Arizona industry

# STI's Plan Deployed in Three Interlocking Projects: 1. AzSmart

**A single comprehensive analysis tool developed to optimize renewable energy deployment on the Arizona grid. The project:**

- Using a seven screen decision theatre provides an interactive, integrated, visual decision tool.
- Creates a multidisciplinary team: ASU/UA economists, power engineers, GIS experts, and IT modelers.
- Presents immediate results that used to take months.
- Utilizes only industry or operational project inputs
- Pick a potential site or an objective: example replace coal plant at four corners with renewable energy projects.
  - Tells you where
  - Best technology and power output
  - Prices
  - Transmission and water implications
  - Environmental and Economic costs

# **#2 Photovoltaic Environmental Performance and Reliability**

**Using industry products and with utilities, NREL, Sandia as partners increase our understanding of the factors which limit industry's development of high performance reliable modules and systems. The project:**

- Improves the manufacturability of modules and inverters
- Narrows warranty issues
- Provides a platform for organizing and quantifying field performance data
- Develops accelerated lifetime testing methods
- Reduces module testing turnaround time
- Trains solar workforce of future
- Offers preferred access to Arizona based firms

# #3 Concentrating Photovoltaic Systems (CPV)

**Arizona with its best in the nation solar radiation is the ideal market for tens of gigawatts of high performance concentrating solar energy systems. The project supports:**

- Development of innovative concentrator systems concepts
- Creation of a Cluster of 5 industry leaders and 8 universities to improve the cost competitiveness of CPV systems
- Research plan includes cells, cell packaging and optics, trackers and finally assembly of complete systems.
- Milestone deliverables start with fixing specifications, moving to validating component manufacturing and finally characterizing field performance.
- An accelerator network with easy access to key policy and private sector players provides outreach and market analysis.

# Technology in the Context of Infrastructure Investment Driven by Public Benefits

- Rickover giant believer in nuclear power and its role our national defense, and engineering oversight was the top priority.
- Gulf Oil Spill failed to look at the technological challenges in ever deeper waters— environmental assessment took priority
- Hoover Dam Bypass Bridge lesson in regional/federal cooperation—280 ft cranes collapsed in high winds replacements now carry 20 ton boulders
- Gotthard Base Tunnel: 400 meter long boring machines 60 bit on 10metre bore head, 25 tonne pressure . One centimetre vertical and horizontal leeway
- San Jose Mine rescue: Piston-driven hammers drove a curving 28-inch diameter shaft 2041 feet through hard quartzite rock to reach the miners. Specially-designed spring-loaded wheels enabled the Freedom Rescue Capsule to ride smoothly on its trips though the rock-lined tunnel. NASA provided a high-calorie liquid diet to the trapped miners designed to prevent nausea during the nearly half-mile curving ascent and medical instruments closely monitored their vital signs during the entire ride.