

**CALIFORNIA ENERGY COMMISSION**  
**REPORT OF CONVERSATION Page 1 of 1**



*Energy Facilities Siting Division*

**FILE: Efficiency**

**PROJECT TITLE: Carrizo Energy Solar Farm**

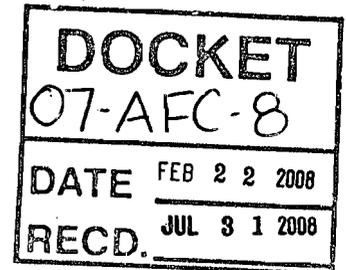
<input checked="" type="checkbox"/> Telephone		<input type="checkbox"/> Meeting Location: CEC	
<b>NAME:</b>	Golam Kibrya	<b>DATE:</b>	Feb. 22, 2008
		<b>TIME:</b>	3:00 p.m.
<b>WITH:</b>	Energy Generation Research Office, Energy Research and Development Div.		
<b>SUBJECT:</b>	Efficiency Measurement of Solar Power Plants		

**COMMENTS:**

Shahab, Erin and I met with Golam to inquire whether the solar industry has made any progress in adopting methods to evaluate the efficiency of solar power plants.

Golam described four types of CSP (concentrated solar power) plants:

1. Parabolic trough
2. Sterling dish
3. Power tower (ex. Ivanpah)
4. AUSRA (ex. Carrizo)



A fifth CSP technology, currently in development, is Concentrating PV.

Golam listed three steps in producing power from the sun, each carrying its own efficiency:

1. Optical (from sun to energy collection device; measures mirror effectiveness)
2. Sunlight-to-thermal energy conversion (typically, heating a fluid such as water or oil)
3. Thermal-to-electrical conversion (typically, a steam turbine generator)

Golam has seen sunlight-to-thermal conversion efficiencies up to 30-40%. Typical Rankine cycle (thermal-to-electric conversion) efficiencies can range 30-40%. Overall efficiencies claimed for some plants reach 15%; Bright Source (owner of the Ivanpah project) has claimed overall solar-to-electric efficiencies up to 20%.

Golam mentioned that the federal DoE will hold a conference in April 2008 that will discuss solar plant efficiency (among other topics).

<b>cc:</b> Shahab Khoshmashrab Erin Bright	<b>Signed:</b>
	<b>Name:</b> Steve Baker