Beacon Solar Energy Project

CEC Informational Hearing
June 11, 2008
FPL Group is a Premier U.S. Energy Company

FPL Group

- $26.7 B market capitalization
- 37,678 MW in operation
- $15.3 B operating revenue
- $40.1 B in total assets

Florida Power & Light

- One of the largest U.S. electric utilities
- Vertically integrated, retail rate-regulated
- 4.5 MM customer accounts
- 22,135 MW in operation
- $11.6 B in operating revenues
- $24.0 B in assets

FPL Energy

- Successful wholesale generator
- U.S. leader in renewable generation
- Assets in 26 states
- 15,543 MW in operation
- $3.5 B in operating revenues
- $14.5 B in assets

A Growing, Diversified Company

Market Capitalization as of May 23, 2008; All other data as of December 31, 2007
FPL Energy, LLC

• A leading clean energy provider with natural gas, wind, solar, hydroelectric and nuclear power plants in operation in 25 states

• The largest generator of solar energy in the country through operations in California’s Mojave Desert (currently operates seven solar facilities)

• Solar Energy is a valuable part of FPL Energy’s clean and renewable energy mix and the company will continue to evaluate solar energy for additional opportunities as feasible
Beacon Project Objectives

- To construct, operate and maintain an efficient, economic, reliable, safe and environmentally-sound solar powered generating facility
- To meet the State of California objectives mandated by SB 1078 (California Renewable Portfolio Standard Program)
- To meet the State of California objectives of AB 32 (California Global Warming Solutions Act of 2006)
Location of Project:
Project Overview

• Electrical output of 250 megawatts
• Project will use proven parabolic trough mirror solar thermal technology
• Solar energy will provide 100 percent of the power generated by the plant
• Project will utilize two auxiliary boilers fueled by natural gas to reduce startup time and to provide freeze protection for the heat transfer fluid
Project Site and Surrounding

Legend
- Transmission Line Options
- Plant Site
- Proposed Gas Pipeline Route
- Natural Gas Pipeline

Map showing locations such as Plant Site, Proposed Gas Pipeline Route, LADWP Barren Ridge Switching Station, Transmission Line Route Option 1, Transmission Line Route Option 2, SR-14, Neuralia Road, and Existing SCG Pipeline.
Solar Parabolic Trough Mirrors
Parabolic Troughs
Solar Trough Collector Loop
Project Components

• A roughly 2,000 acre site containing:
  – Solar arrays
  – Power block with steam turbine and cooling tower
  – Evaporation ponds
  – Rerouted drainage channel
  – Administration building and other facilities

• A new 17.6-mile, eight-inch gas pipeline along Neuralia Road to connect the Project to an existing Southern California Gas Company pipeline west of California City

• A new approximately 3 mile transmission line to connect the Project to the Barren Ridge Substation (2 options being considered)
Why this site?

• Kern County- excellent solar resource
• Site previously disturbed by intensive farming
• Close proximity to transmission infrastructure, making it an ideal site in terms of minimizing environmental impacts
• Site has available water resources to allow wet cooling in order to optimize power generation efficiency and reduce Project cost
Mojave Desert

Source: NREL.gov
Environmental Review

- Air Quality
- Biological Resources
- Cultural Resources
- Geological Resources and Hazards
- Hazardous Materials Handling
- Land Use
- Noise
- Paleontological Resources

- Public Health
- Socioeconomics
- Soils
- Traffic and Transportation
- Transmission System Safety & Nuisance
- Visual Resources
- Waste Management
- Water Resources
- Worker Safety

Highlighted topics are discussed in this presentation
Biological Resources

- Site is largely disturbed due to previous intensive agricultural operations
- Extensive biological surveys have been performed
- Some habitat (<6 acres) for desert tortoise and Mohave ground squirrel will be impacted west of the site along the transmission line route
- Biological permitting with the California Dept. of Fish and Game and U.S Fish and Wildlife Service has been initiated
- Proposed mitigation would ensure that impacts are reduced to less than significant levels
Geologic Hazards

• Two California designated earthquake fault zones are present within the site
• All Project structures will be designed to meet Seismic Zone 4
• Critical structures such as the power block, evaporation ponds and administration buildings will be placed outside the designated fault zones
Land Use Consistency

• Project site is almost completely vacant and significantly disturbed from past agricultural activities

• Consistent with Zoning ordinance (Exclusive Agriculture or Limited Agriculture)

• General Plan (GP) Land Use designations:
  – Majority of plant site is designated for Resource uses (consistent with GP)
  – Northern portion of the plant site has a residential land use designation (will need a GP Amendment)
Visual Resources

• Project structure, stacks and transmission line structures will be a neutral color and surfaces will be non-reflective
• No significant glare would be expected
• From elevated locations at certain times of the day, the facility would contrast substantially with the surrounding environment (resemble a body of water)
• Transmission line will cross Highway 14
Plant site without simulated Project facilities
Plant site with simulated Project facilities
Transmission Line Route – Existing Conditions
Transmission Line Route with Simulated Facilities
Water Resources

• **Water is needed for:**
  – Wet cooling tower for power plant cooling
  – Industrial uses (process water makeup, mirror washing, etc.)
  – Employee use (drinking, showers, sinks, and toilets)

• **Supplied by existing onsite wells (without significant effects on other users or on the groundwater basin)**

• **Alternative water sources are continuing to be investigated**
Project Water Supply Wells and Desert Wash Diversion
Groundwater Usage

• Project located in the Koehn Sub-basin of the Fremont Valley Groundwater Basin

• Groundwater dropped 200-250 feet during agricultural pumping, but has since recovered 100-130 feet in local wells

• The Fremont Valley Groundwater Basin has a storage capacity of about 5M acre-feet

• Project will use 1,600 acre feet per year

• Project will not significantly affect groundwater recharge, instead it will slow the rate of recovery
Project Schedule

- Construction to begin in 2009 with a goal of completion in 2011
- Project is to be owned and operated by Beacon Solar LLC
- The new natural gas pipeline will be owned and operated by the Southern California Gas Company