

Questa Concentrating Photovoltaic (CPV) Solar Project: An Example of Successful Beneficial Re-use



Innovative Approaches to Mining Site Remediation and Re-use Workshop
International Committee on Contaminated Land (ICCL)

Kent DeBoer
Chevron Technology Ventures
October 6, 2011
Arlington, Virginia



Questa Solar Project



- Project Background
- Location
- Timeline
- Technology
- Why this beneficial re-use project was successful

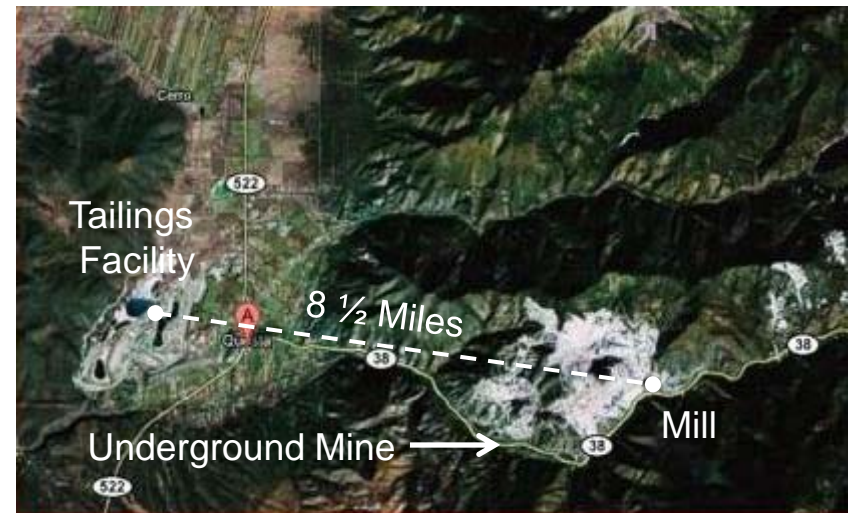


Background Location



Operating molybdenum mine in northern New Mexico

Solar field built on inactive area of operational tailings facility

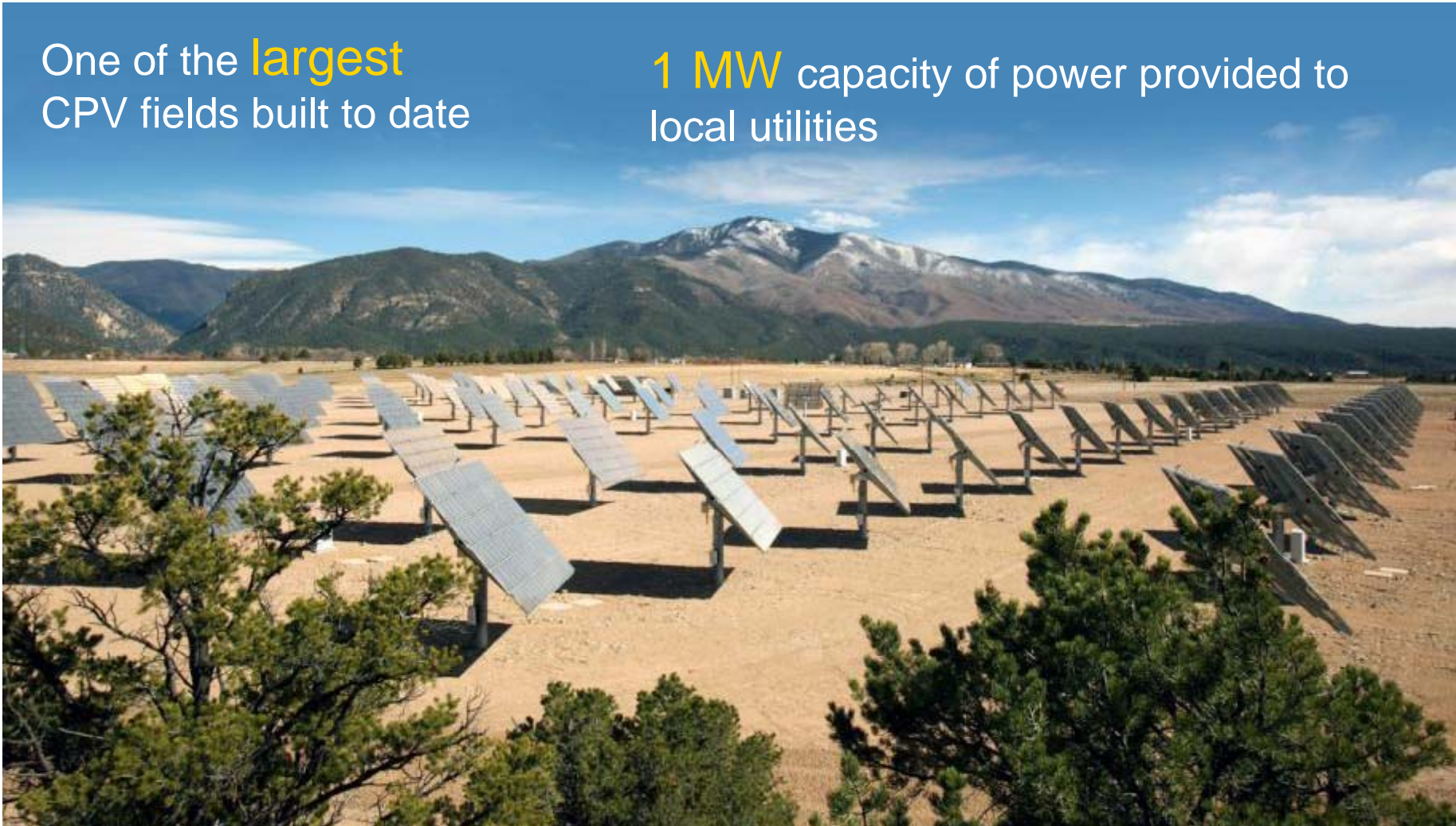


Background Demonstration of CPV Technology



One of the **largest**
CPV fields built to date

1 MW capacity of power provided to
local utilities



Background Project Timeline



2008 → May 2010 → February 2011 → April 2011
Project Began → Construction Began → First Power to Grid → Commissioned

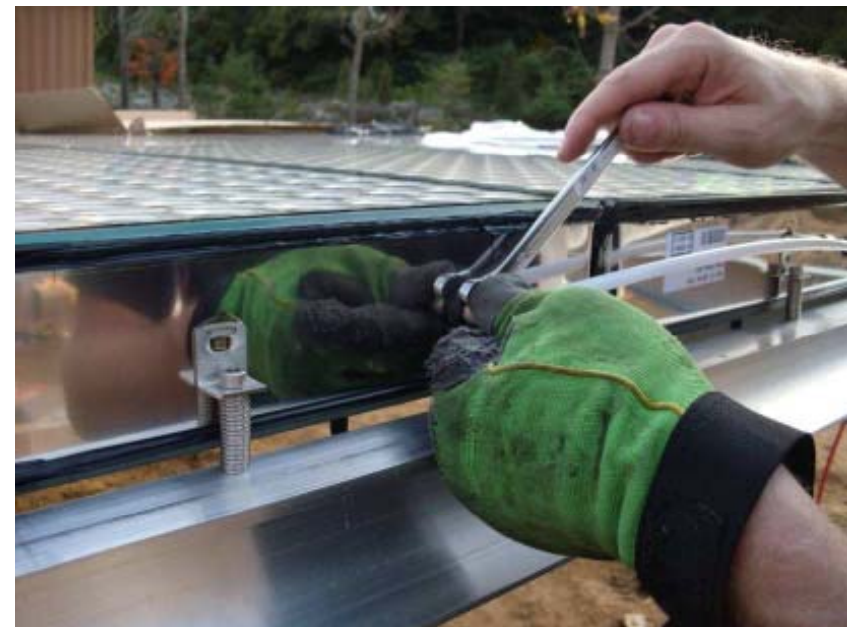
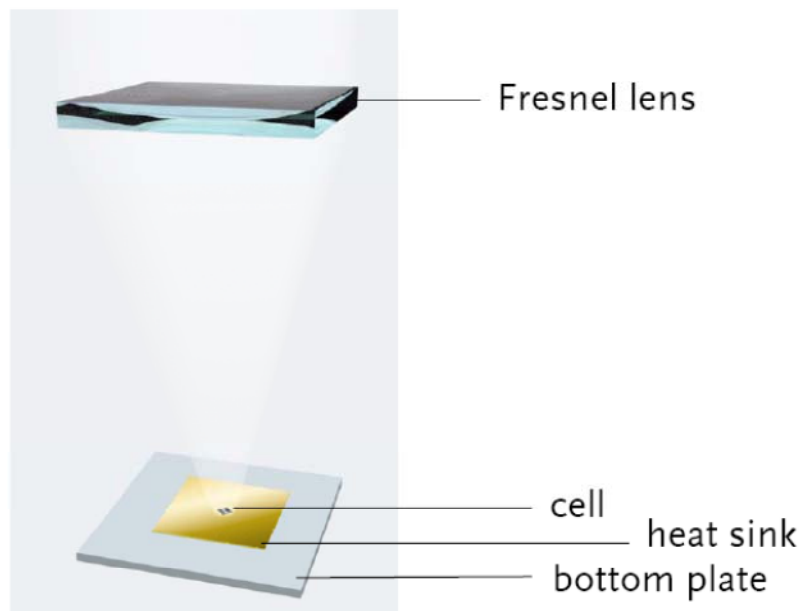


What is CPV?



Concentrating Photovoltaic

- Technology provided by Soitec in Freiburg, Germany
- Light is concentrated by Fresnel lenses to very small photo cells
- Works well with direct radiation
- Panels must be continuously focused to the sun within 1 degree

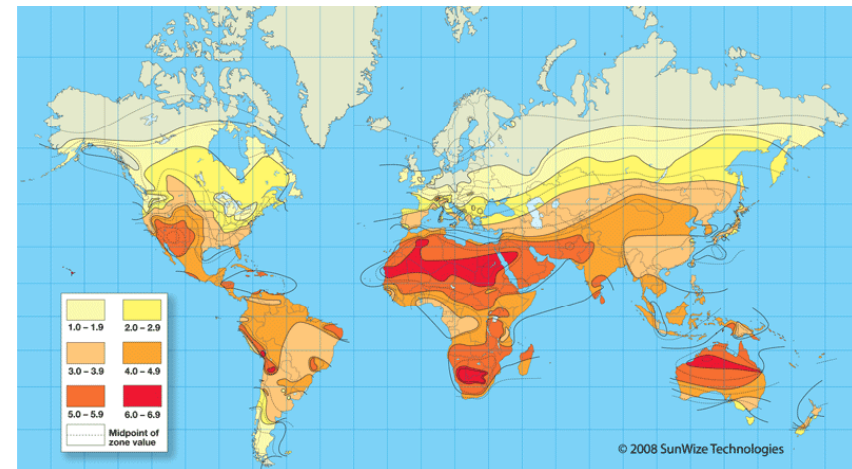
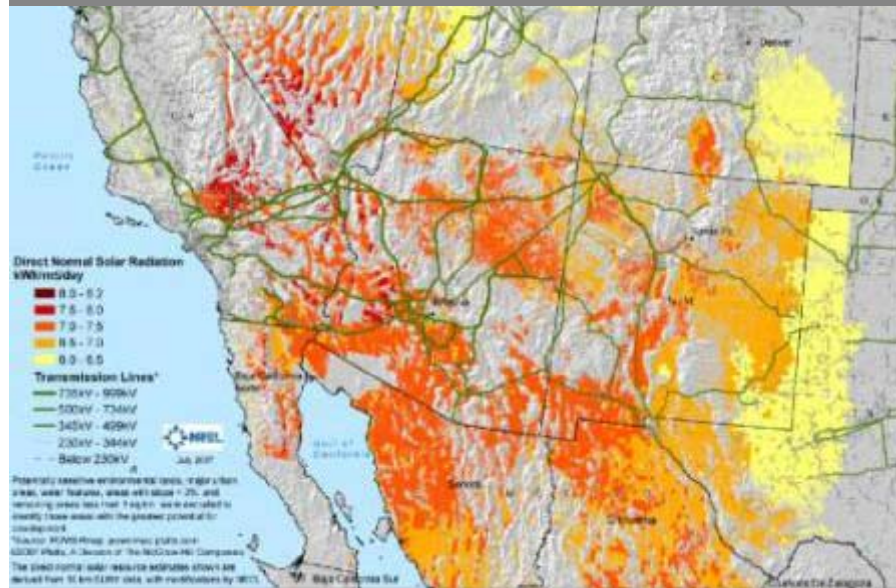


Why CPV in Questa, New Mexico?



Northern New Mexico has high direct normal irradiation (DNI) –
CPV is practical in locations with DNI >5
This location represents a good opportunity for beneficial re-use

Concentrating Solar Power Prospects of the Southwest United States



DNI worldwide* - source International Energy Outlook 2008 –
Report DOE/EIA – 0484 2008

Objectives



- Continue to build portfolio of renewable energy projects
- Opportunity to demonstrate beneficial re-use
- Evaluate a new technology for possible applications in other Chevron Business Units
- Evaluation of alternative cover depths for future closure
- Ongoing collaboration with agencies
- Utilize local resources for project construction



Stakeholder Engagement



Developed Stakeholder Engagement Plan

- Identify internal and external stakeholders
- Revisit frequently
- Manage expectations



Addressed Individual Concerns

- EPA: Beneficial re-use of brownfield
- NMED: Surface water infiltration/runoff from panels
- Village of Questa: Long-term renewable opportunities; jobs
- New Mexico CID: New technology not addressed in current codes



Advantages of Beneficial Re-use



- Chevron has access to plenty of plot space to support their worldwide operations
- As business needs changed, some assets that are located near industrial infrastructures remain idle
- Site prep is usually less than a greenfield renewable energy project



Encouragement from Agencies

Agencies such as The National Wildlife Federation continue to favor the use of previously impacted land for land intensive renewable energy projects vs. green field projects.

As was the case with Questa, renewable projects can provide win-win opportunities for both Chevron and the various agencies.

More Examples of Beneficial Re-Use Within Chevron



This Chevron wind farm in Casper, Wyoming is located on a former refinery site and can produce 16.5 MW of power from 11 wind turbines.



This 750 kW solar field was built on a former refinery site in Bakersfield, California and demonstrates seven emerging thin-film photovoltaic technologies.



Questions?

