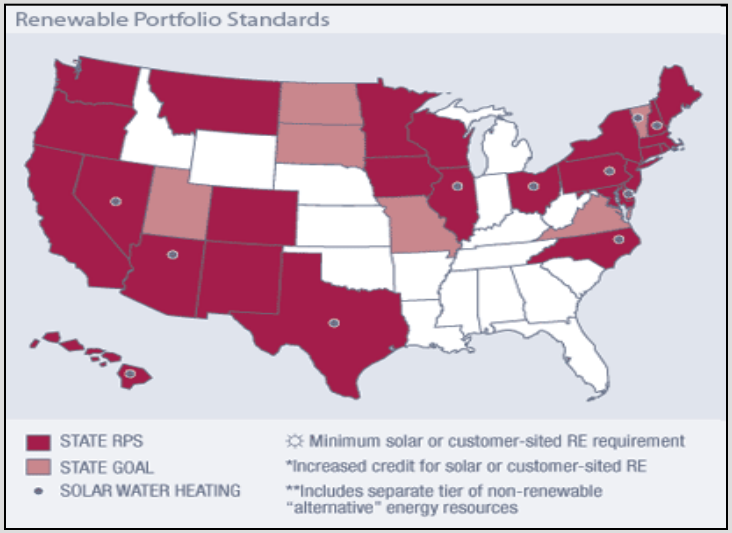
FUPWG Meeting October 21, 2010

Project Finance Case Studies



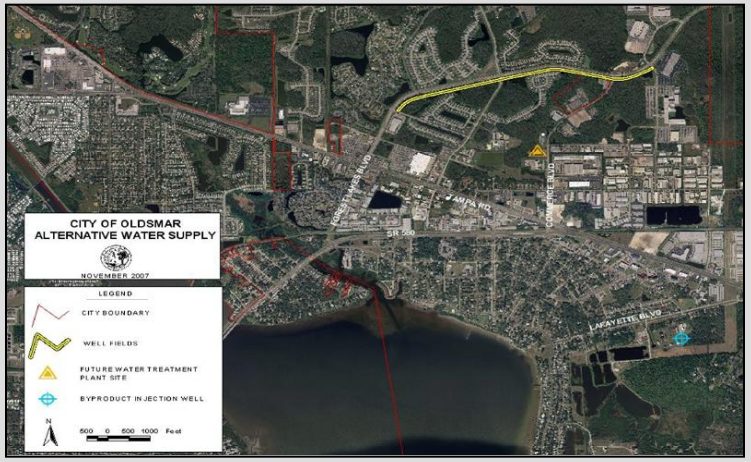

HANNON ARMSTRONG

RENEWABLE ENERGY



- Solar, wind, biomass and geothermal power resources show great promise to positively impact both the environment and energy security.
- While these technologies are coming down in cost, there is often no price associated with carbon content, causing renewable energy to remain more expensive than fossil fuels in most markets.
- Utilizing Treasury Cash Grant, Investment and Production Tax Credits, Renewable Energy Credits and state rebates is essential to a project's viability.

WATER and WASTEWATER



- With operating budgets stretched, many public-sector utilities are struggling to upgrade critical water treatment facilities to comply with changing environmental regulations or to maintain system efficiencies.
- Hannon Armstrong can provide the capital necessary to expand or rebuild these facilities, either through a tax-exempt financing structure or through the privatization of existing assets.
- Municipalities and Water/Sewer Authorities can finance the improvements they need quickly, easily and economically through one of Hannon Armstrong's competitive tax-exempt products which are designed to help avoid the legal fees and lengthy documentation associated with issuing traditional bonds.

Renewables in UESC/ESPC Task Orders

- In most UESCs/ESPCs title to the asset conveys at acceptance. In order to capture the tax benefits, title must convey to a tax-paying entity.
- The Federal customer will have the option to purchase the asset for fair market value at anytime after five years. Alternatively, at the end of the contract they can purchase the asset, extend the service agreement, or return the asset.
  - The Federal customer will amortize an amount less than the full cost of the renewable asset.
- The Utility/ESCO shall be responsible for the operations and maintenance of the renewable asset.

States: Renewable Power Generation

Environmental concerns are driving public policy at the state level

Many states (28 plus DC) have adopted mandatory renewable portfolio standards (RPS) and these tax incentives vary drastically from state to state.

- RPS is a state policy that requires utilities to obtain a minimum percentage of their power from renewable energy resources by a certain date. Penalties are imposed for non-compliance
- A utility can satisfy RPS standard by Renewable Energy Credits (REC). These credits can, in special cases, also qualify for VER (Verified Emission Reduction) related to GHG, for example landfill gas production
- Currently discussion regarding association of GHG with REC ongoing in California

Discussions recently ongoing with respect to a national RPS which will require all states to generate 20% of their electricity from renewable power by 2020, further stressing the need for renewable power

The economics of U.S. renewable energy projects rely heavily on tax benefits

Federal: Renewable Power Generation

Environmental concerns are driving public policy at the federal level

Federal Tax Benefits: There are two major categories of federal tax incentives currently in place

- Projects can claim "*one*" of the following tax based incentives:
  - Production Tax Credits (PTC) are based on megawatt hour of electricity generated and currently equal to $21/MWh. PTCs are claimed over 10 yrs
  - Investment Tax Credit (ITC) is based on capital cost of project and not on generation of electricity. ITC value is claimed as one time tax credit of 30% of eligible capital cost on the day when project placed in service
  - Grant is exactly the same value as ITC but, unlike ITC, is available to developers in the form of cash instead of tax credits and expires earlier than ITC
- 5 yr Accelerated depreciation for most capital items

The economics of U.S. renewable energy projects rely heavily on tax benefits

The American Recovery and Reinvestment Act of 2009
Renewable Energy Sector Updates

Resource Type	In Service Deadline	Credit Amount (PTC)	Credit Amount (ITC)
Wind	December 31, 2012	2.1¢/kWh	30% of capital cost
Closed-loop Biomass	December 31, 2013	2.1¢/kWh	30% of capital cost
Open-loop Biomass	December 31, 2013	1.0¢/kWh	30% of capital cost
Geothermal	December 31, 2013	2.1¢/kWh	30% of capital cost, 10% after December 2013
Solar	December 31, 2016	30% ITC	30% of capital cost, 10% after December 2016

- **Note that a project can elect to receive ITC credit in lieu of PTC. Further, a project can elect to receive Grant in lieu of ITC.**
- **Grant is available to projects that start construction by Jan 1, 2011 and is placed in service by deadlines mentioned above for each project.**

Customer Economic Benefit

Tax incentives upon completion of project

- ITC or Treasury Cash Grant – 30% of project cost
- Depreciation – double in year one and spread out over a period of five years
- RECs – vary by state RPS
- No disposal of obsolete asset

The World of Risk

- **Project & Performance Risk**
  - Risk is reduced after acceptance
  - Ongoing performance, i.e., operations & maintenance and any savings/production guarantee
  - Financial Strength of Utility/ESCO and Subcontractors
  - Project economics and technologies

- **Credit & Collateral Risk**
  - Blended commercial & governmental differ
  - Repossession difficult
  - After acceptance, viability for LT performance requirements
  - Size and term of financing

- **Governmental Risk**
  - Agency budget, population served, mission criticality, facility essentiality, contract language/vehicle, tax credit reliance, local laws or codes

Mitigation for Project Finance

Assumes standard due diligence has been completed

- Bonding – Dual if Federal customer is also party
- Independent Engineer – review design, progress, certify milestones for draw payments
- Credit of Utility/ESCO and Subcontractors
- Technology/economics ongoing performance requirements
- Federal customer sign off on milestones – protection in the event of a T4D
- Step in rights
- ACA Alt 1
- Hold back of substantial amount of final milestone/draw payment. More for non IGC.
- Termination language

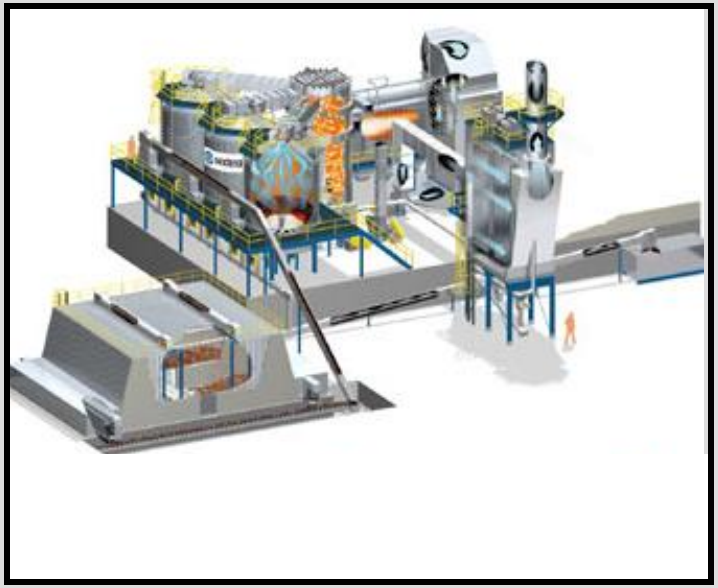
Hot Buttons – Lessons Learned

- Project should stand on its own – a business plan for the system or infrastructure with conservative assumptions yielding market ROIs
- Assumptions on long term tax credits and politics
- Long term payback horizons in an age of quarterly results – mission and strategy questions mixed with credit/collateral
- Documents and structure remain critical for all parties – Federal contract and contract (MPA) between Utility/ESCO / Subcontractors and Financier – and are governed by GAAP, tax and FARs/DFARs, etc.
- Environmental and liability issues can complicate
- Utility/ESCO and Federal customers' long term planning assumptions and ability to execute
- Information sites: http://www.dsireusa.org/ (Renewables)

Case Study: Commercial Scale

Biomass Gasification for a National Laboratory.

- **The Situation:** Oak Ridge National Laboratory is one of the premiere research labs in the world, exploring some of science's most complex questions, including how to advance the US energy infrastructure.
- **The Problem:** With a WWII vintage power system and funding constraints, ORNL was not leading by example in the area of technology development and commercialization, despite abundant renewable resources in the area.
- **The Solution:** Through an Energy Savings Performance Contract ("ESPC"), Hannon Armstrong provided the required $100 million to allow Johnson Controls to install a state-of-the-art biomass gasification project, along with other energy upgrades.
- **The Benefit:** ORNL has reduced its carbon footprint dramatically by replacing substantial fossil fuel use with local biomass, all while reducing costs.



Case Study: Design, Construction, and Financing of Chiller Plant at Howard University Hospital.

- **The Situation:** Howard University Hospital (”Howard”), a Level 1 Trauma Center has become one of the most comprehensive health care facilities in the Washington, D.C. metropolitan area.

- **The Problem:** Howard’s facilities suffered from an inadequate chiller plant. The undersized air conditioning system did not provide adequate cooling to keep the hospital facilities at a comfortable ambient temperature or to maintain indoor humidity at manageable levels. Howard could not shut down the current chiller plant during the construction of a new chiller plant, which was expected to take almost a full year. Moreover, budget constraints greatly limited Howard’s options for buying the new equipment.

- **The Solution:** In response to Howard’s needs, Honeywell Building Solutions (“Honeywell”) and Hannon Armstrong teamed with Howard to offer a comprehensive solution that covered the design, construction and financing of a new chiller plant. Under the resulting public-private partnership, Hannon Armstrong took title to the existing chiller plant, with Honeywell as operator. Howard entered a long term purchase contract with Hannon Armstrong for the purchase of chilled water. Honeywell has designed an expanded chiller plant, and begun construction on the new facility which will also be owned by Hannon Armstrong. Once the new chiller plant is completed, Honeywell will operate it on behalf of Hannon Armstrong. Substantial portions of the old chiller plant will then be refurbished and maintained as backup for Howard’s future cooling needs.

- **The Benefit:** In the short term, Howard benefited financially from the sale of its existing chiller equipment to Hannon Armstrong, and shifted operating risk for the aging facility to Honeywell. In the long term, Howard will have the benefit of an affordable, new, properly-sized chiller plant for its first rate hospital facilities.

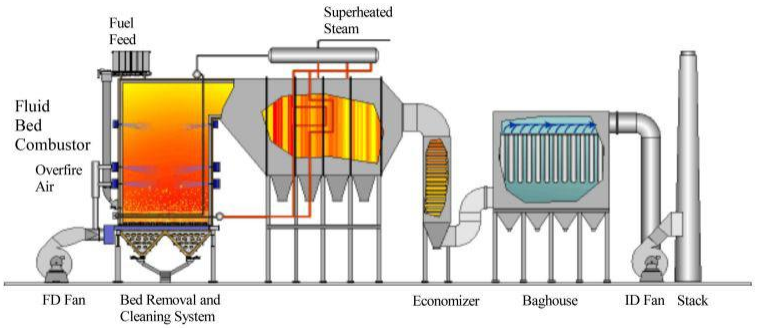
Case Study: Biomass Cogeneration Commercial Scale Biomass Cogeneration for a U.S. Department of Energy Facility.

- **The Situation** The U.S. Department of Energy's Savannah River Site is a former nuclear weapons manufacturing facility with ongoing nuclear cleanup operations requiring the use of high pressure steam for vitrification.

- **The Problem** With a 1950s era coal-fired steam plant and funding constraints, SRS was not leading by example in the area of clean technology development and commercialization, despite more energy efficient technology and abundant renewable resources in the area.

- **The Solution** Through an Energy Savings Performance Contract ("ESPC"), Hannon Armstrong provided $125 million to enable its client to install a biomass cogeneration facility capable of producing 240,000 pph of steam and 20 MWs of electricity, along with other energy upgrades.

- **The Benefit** SRS has reduced its greenhouse gas emissions by 100,000 tons per year by replacing substantial fossil fuel use with local biomass, all while reducing ongoing operating costs.



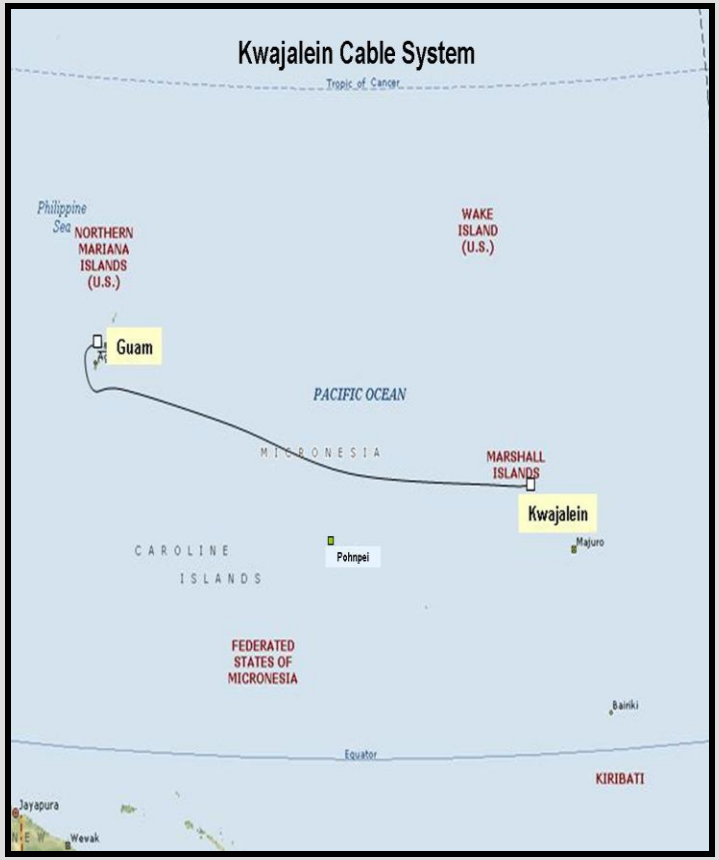
Case Study: Fiber Optic System for US Army Kwajalein Atoll (USAKA).

- **The Situation:** U.S. Army Kwajalein Atoll ("USAKA") is home to the Reagan Ballistic Missile Defense Test Site ("RTS") which plays a critical role in the research, development, test and evaluation of the United States' missile defense and space programs.

- **The Problem:** USAKA communications are satellite-based, which is costly and allows limited bandwidth. As a result, SMDC has to maintain a number of expensive DoD contractors at USAKA that could otherwise perform their functions remotely from SMDC's Huntsville headquarters.

- **The Solution:** Hannon Armstrong owns and financed the $63 million 2,900 km fiber optic system, connecting to Guam, for further connection to Huntsville.

- **The Benefit:** USAKA will be able to significantly lower costs in the Pacific by moving skilled jobs back to the US and accelerate information flows through the secure fiber optic system.



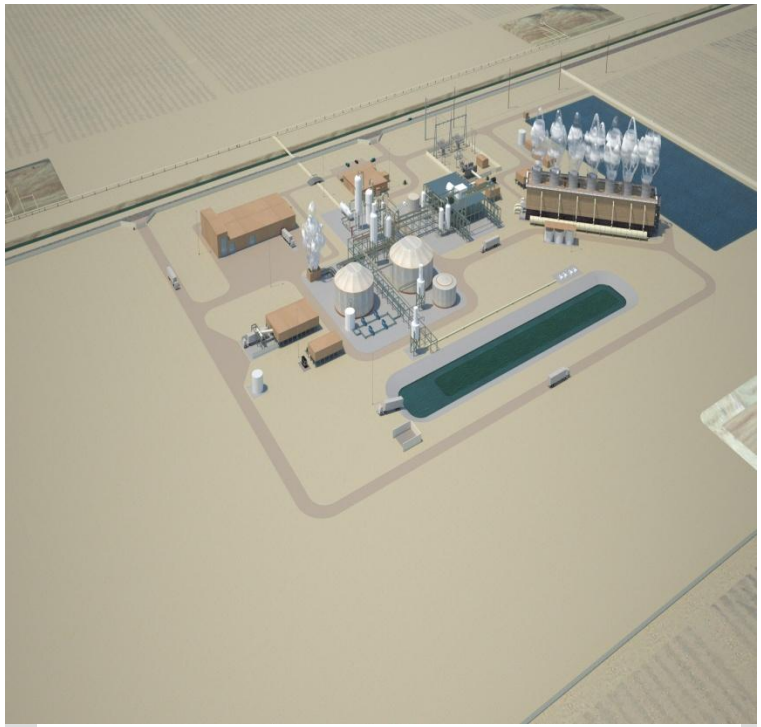
Case Study: Fiber Optic System for NASA/NOAA and USAF in the Arctic Circle.

- **The Situation:** Critical environmental data is only available 24 hours a day from an observatory in Norway, in the Arctic Circle
- **The Problem:** NASA/NOAA and the U.S. Air Force needed a fiber optic line to ensure fast and reliable transmission of the data, but had no funding.
- **The Solution:** Hannon Armstrong provided the $40 million required to build the fiber optic system, taking payment out of avoided satellite transmission fees.
- **The Benefit:** The US Government will save over $140 million in communications cost over the life of the system.

Case Study: Utility Scale

Geothermal Power Plant in Salton Sea Area

- **The Situation:** EnergySource LLC had a 30-year PPA with a utility off-taker for a utility-scale geothermal power plant, but lacked the capital required for construction.
- **The Problem:** The Project Finance market had not seen a triple-flash geothermal transaction in 20 years and to make matters worse, there was no EPC wrap on the project.
- **The Solution:** Hannon Armstrong advised EnergySource how to create a synthetic EPC structure and reacquainted the lenders on the merits of base-load geothermal power plants. As a result, Hannon Armstrong was successful in arranging approximately $400 million in construction loans and project equity for the company.
- **The Benefit:** EnergySource was able to begin construction of its geothermal power plant, bringing hundreds of jobs to Imperial County, CA, and was able to finance the development of its project portfolio.



Hudson Ranch I Geothermal Project Overview

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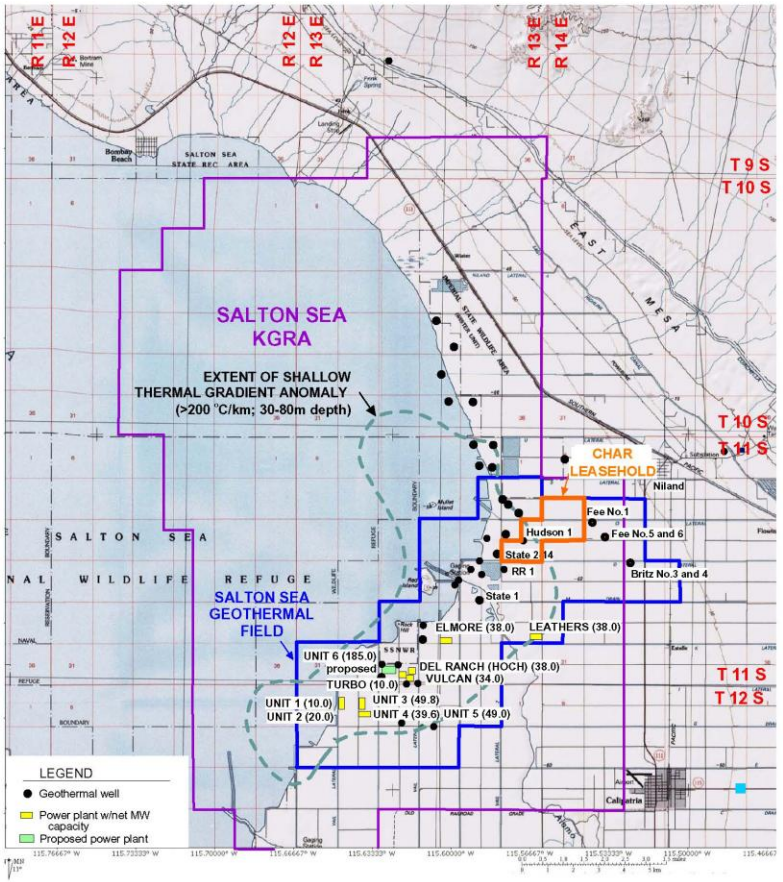
Hudson Ranch I Project

- Hudson Ranch I is the first flash-technology geothermal project in the prolific Salton Sea resource since 1990
- 49.9 MW net plant output
- Two production wells drilled and tested provide >95% of gross project steam requirements
- 2,500 acres minerals lease hold; resource expected to yield 2-3 similar projects as well as solar farms

Salton Sea Geothermal Resource

- Largest geothermal resource in North America
  - 1,500-2,500 MW est. capacity
- Resource Characteristics
  - Shallow heat anomaly
  - Producing electricity since early ’80s
    - 10 plants, ~350 MW
  - Highly fluidized
  - Highly mineralized
  - Historically low resource degradation
- Project Characteristics
  - High capital cost for brine treatment system
  - High plant capacity factor ~95%
  - Base load renewable energy



Project Resource & Verification

- Two production wells drilled January-June 2008
- Results of GeothermEx testing:
  - Well 1: 12-18 MW capacity
  - Well 2: 28-40 MW capacity
  - 97% of required plant steam capacity attained
- Remaining wells currently being drilled:
  - 1 production well
  - 4 injection wells

Plant Construction & Operations

- Hudson Ranch I functions as general contractor; supported by:
  - **Engineering Contractor (AMEC)**
    - Detailed design
    - Major equipment procurement administration
  - **Construction Contractor (PMC)**
    - Civil, electrical, mechanical works
    - Construction management
    - Plant start-up & testing (w/ AMEC)
  - **Construction Monitoring Contractor**
    - Owner's Rep for cost acctng & sched
- Turbine generator from Fuji
- O&M Contract with Hudson Ranch Energy Services

Interconnection, Transmission & Water

•Imperial Irrigation District provides electrical interconnection, transmission and water supply to the Hudson Ranch I and II projects

- **Generator Interconnection Agreement** executed with IID covers 100 MW – sufficient for two Hudson Ranch geothermal plants
- Transmission to energy off-taker covered under **Transmission Services Agreement**
- Project water requirements covered under IID **Water Supply Agreement**

Development & Financing Status

- Project energy, capacity & environmental attributes sold under 30-year PPA with AA/Aa-rated utility Power Purchaser
- All critical project permits in place
- Sufficient geothermal resource verified by drilling/testing of first two production wells
- Interconnection, Transmission and Water Supply Agreements in place with local utility
- $40 million development investment
- $400 million financial close May 2010 – construction commenced and completion expected Feb 2012

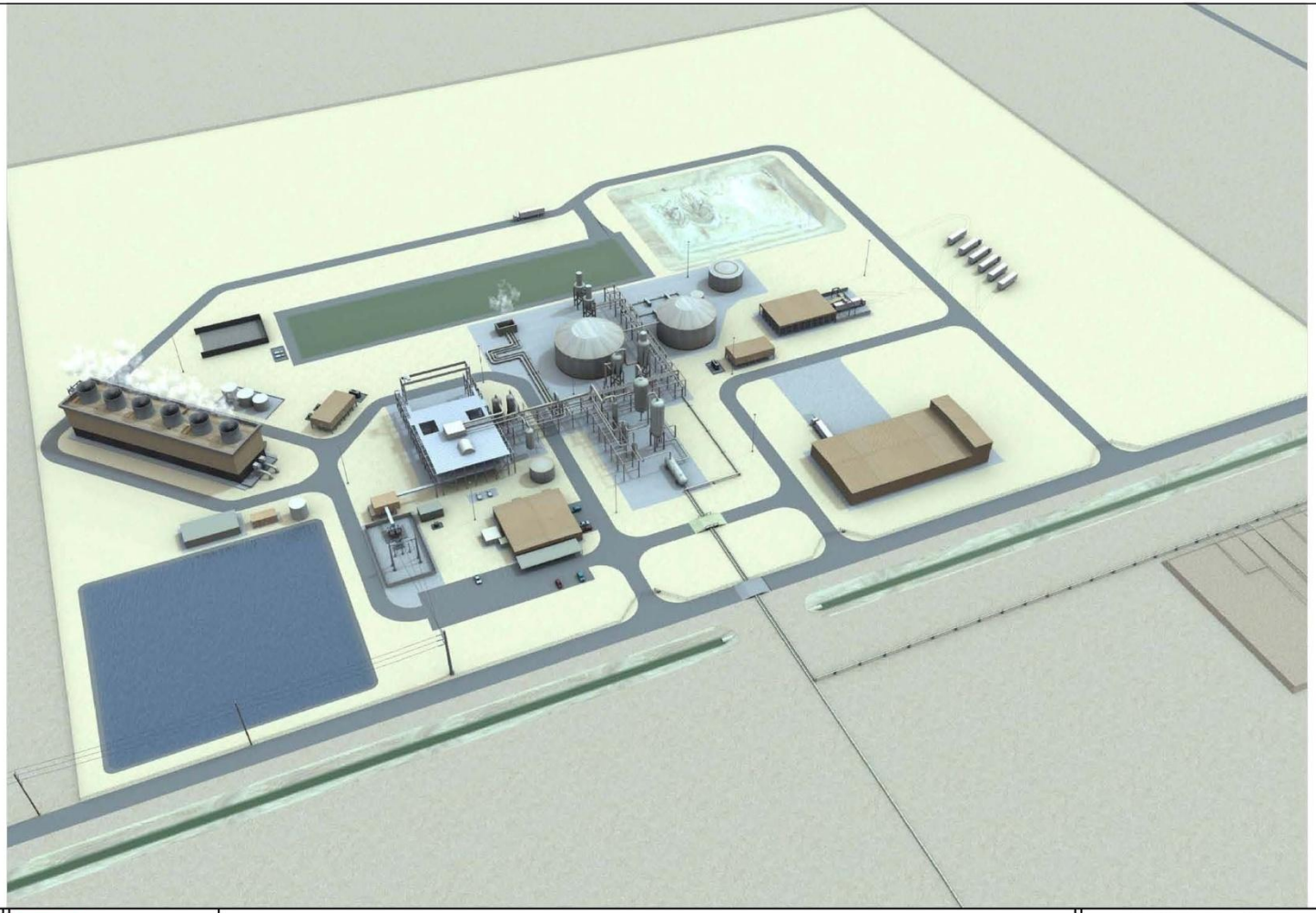
Additional Initiatives

- Solar power development on surface land, utilizing existing infrastructure
- Minerals recovery partnership – un-projected upside from third party production of lithium, zinc, manganese from project brine streams

Summary

- We are developing base load geothermal generating stations to sell competitive renewable energy on a wholesale basis to regional utilities subject to RPS requirements.
- Our team has the development skills, financial resources, geothermal resource and expertise to re-start high temperature (flash technology) geothermal power project construction in the Salton Sea resource.
- Hudson Ranch I development is completed and 21-month construction period commenced May 2010.
  - Commercial operations in early 2012
- Plant design and well field plan in place; remaining resource to be developed in similar 49.9 MW units.

Plant Rendering



drafting pmc

HUDSON RANCH POWER I
49.9MW CRC PLANT
PERSPECTIVE VIEW 2

PROJECT No. 8015-30-01_3
DRAWING 3D View 2
SHEET

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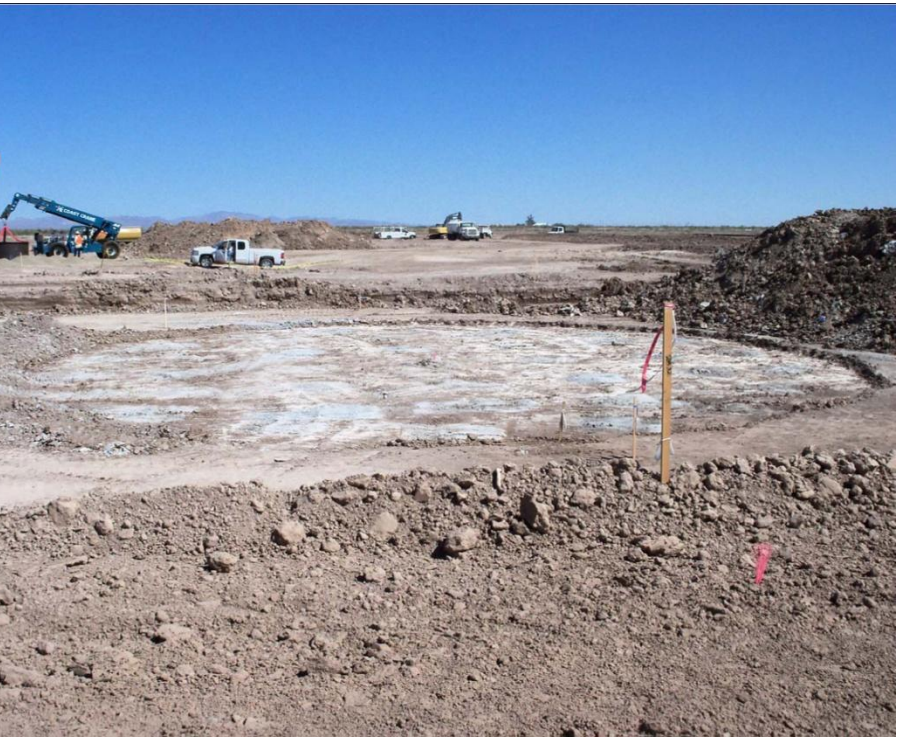
Hudson Ranch Photos

Hudson Ranch Photos



Hudson Ranch Photos

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