Harvesting California’s Renewable Energy Resources:
A Green Jobs Business Plan

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Federal Stimulus Legislation and California Green Jobs

• Host of studies show California ranks No. 1 in generation of green jobs from investments in renewable resources

• As a whole, renewable energy projects create four to six times as many jobs as equivalent investments in fossil fuels

• California diversity of renewables can create jobs in all regions of the state: North, South, East and West
33% RPS is First Step: CA Support Growing...

- Governor’s Executive Order of November 17, 2008 (MOU on state and federal permitting for renewables/transmission)
- CARB’s Scoping Plan of December 11, 2008 (33% RPS key to AB 32 compliance)
- 2009 Legislative Session: AB 64 (25% by 2015; 35% by 2020; 50% by 2035)
Job Impacts of 33% RPS

- Over $60 billion pumped into CA’s sagging economy
- Between 100,000 and 235,000 total jobs under current business conditions
- Nearly 200,000 manufacturing jobs alone with state tax reforms and other policy changes
CEERT/CAISO 33% Scenario

33% Renewable - Generation Mix in MW

- Biomass, 1778
- Geothermal, 3970
- Wind, 7926
- Hydro, 8464
- Concentrated Solar, 8066
- PV Solar, 2860
- Nuclear, 4550
- Small Hydro Lt 30MW, 822
- Fossil, 33000
Which Renewables are Best?

- Diversity is always key in power supply
- Solar PV generates most jobs (but is the most expensive)
- Wind is cheapest (but generates least amount of jobs)
- Geothermal and biomass provide power 24/7 and bolster rural economies
- It’s all good…trade-offs inevitable
EPRI/CEC Job Estimates

Number of Jobs/MW

- **Wind**: 2.86 jobs/MW
- **CSP**: 5.93 jobs/MW
- **Solar PV**: 7.26 jobs/MW
- **Geothermal**: 5.67 jobs/MW
- **Landfill/Digester Gas**: 5.00 jobs/MW
- **Natural Gas**: >1.0 job/MW
Solar PV

• Barclay’s claims solar PV generates >43/jobs/MW.
• How can this be?
• Distributed vs. Central Station
• Best Urban Opportunity
• Ecological Footprint issues with utility-scale solar PV projects in rural regions
Methodologies Differ & Forecasts Highly Uncertain

Worldwide Employment in PV-Related Jobs 2030 (3.7M Jobs)

- Installation: 75%
- Production: 14%
- Wholesaler: 4%
- Research: 2%
- Supply: 5%
Best State Renewable Basins?
Southeastern California: Imperial and Kern counties

- Imperial: “Crown Jewel” of geothermal; 25% unemployment rate
- Kern: CA’s premier wind resource & world class CSP; lack of transmission lines
Need For Green Infrastructure!

• Best way to meet 33% RPS with CA resources is new transmission lines
• Sunrise PowerLink controversy
• Obama’s pledge of $11 billion for “smart grid” and 3,000 miles of new transmission
• Reducing environmental impacts of T&D
Urban Green Job Opportunities

• LA, SF and San Diego rank in Top Ten in current US green jobs
• LA: 20,000 total green jobs; Clean Tech Industrial Parks
• SF/Silicon Valley: 8,000 solar jobs
What about Central Valley?

• Health Impacts: Nation’s most contaminated air
• Fresno: highest concentration of poverty in the nation
• Biomass plants: > 300 jobs per facility
Sacramento by 2038…

• Could rank No. 15 in US in green jobs
• Green Jobs sector to grow from over 8,000 jobs in renewable energy sector today to 109,570 jobs in 2038
• By 2038, Los Angeles would rank 4th in nation (and No.1 in CA) with 159,321 green jobs linked to renewables
California’s Top Challenge?

Green Transmission Lines

- RETI “Competitive Renewable Energy Zones” (CREZ)
- Best Resource/Least Enviro Impact
- Permitting Hurdles
- New incentives for utilities, developers and environmentalists to get “steel in the ground?”
CREZ “Bubble” Ranking
RETIEPRI/CEC 33% RPS

• Tehachapi CREZ: 46,075 jobs in CSP, wind and biomass industries
• Fairmont (LA County): 36,658 jobs in CSP, wind and biomass industries
• Top 8 CA CREZ full renewable resource build-out: 107,564 jobs
• Solar PV not in mix
• Solar PV under CSI adds >20,000-100,000 more jobs to CA total
Conclusions

• Under federal stimulus legislation, CA could generate more green jobs than any other state
• 33% RPS is best first step at state level to capture these economic development benefits
• Most viable way to meet 33% RPS in CA – and Obama’s federal green jobs goal – is to build new “green” transmission lines
Conclusions…

• Enviros should be at the table and become more informed about renewables
• Solar PV is part of the solution, but not the end all and be all
• Diversity of renewable supply hedges risks
• Family of renewable technologies offers green jobs throughout the entire state
• Renewables generate from 4 to 6 times as many jobs as investments in natural gas