EAGLE MOUNTAIN
Hydro-Electric Pumped Storage Project

Eagle Crest Energy Company

Making Renewable Energy Dependable

Northwest Wind Integration Forum
Portland, Oregon
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By
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Electric Power Group

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- Privately held company
- Capital provided by:
  - Individual investors
  - East Coast Energy Fund that manages over $7 billion in assets
- Executive advisory group includes major leaders in the energy field
- ECE is in discussions with some of the world's largest hydro plant equipment suppliers, such as Alstom, Voith-Siemens, Toshiba, etc.

Location and Site Conditions

- Eagle Mountain Project located 65 miles east of Palm Springs near Desert Center
- Project sited at open-pit, abandoned iron ore mines
- Initial water fill and replenishment from non potable ground water sources
- Underground powerhouse 50’ wide x 150’ high x 500’ long
- 6,200’ long access tunnel to powerhouse
- Interconnection to the proposed Colorado River (Midpoint) 500 kV Substation via two new 46-mile transmission lines or to a new closer collector substation under consideration by SCE
- Initial project capacity of 1,300 MW with a potential expansion to over 4,000 MW total

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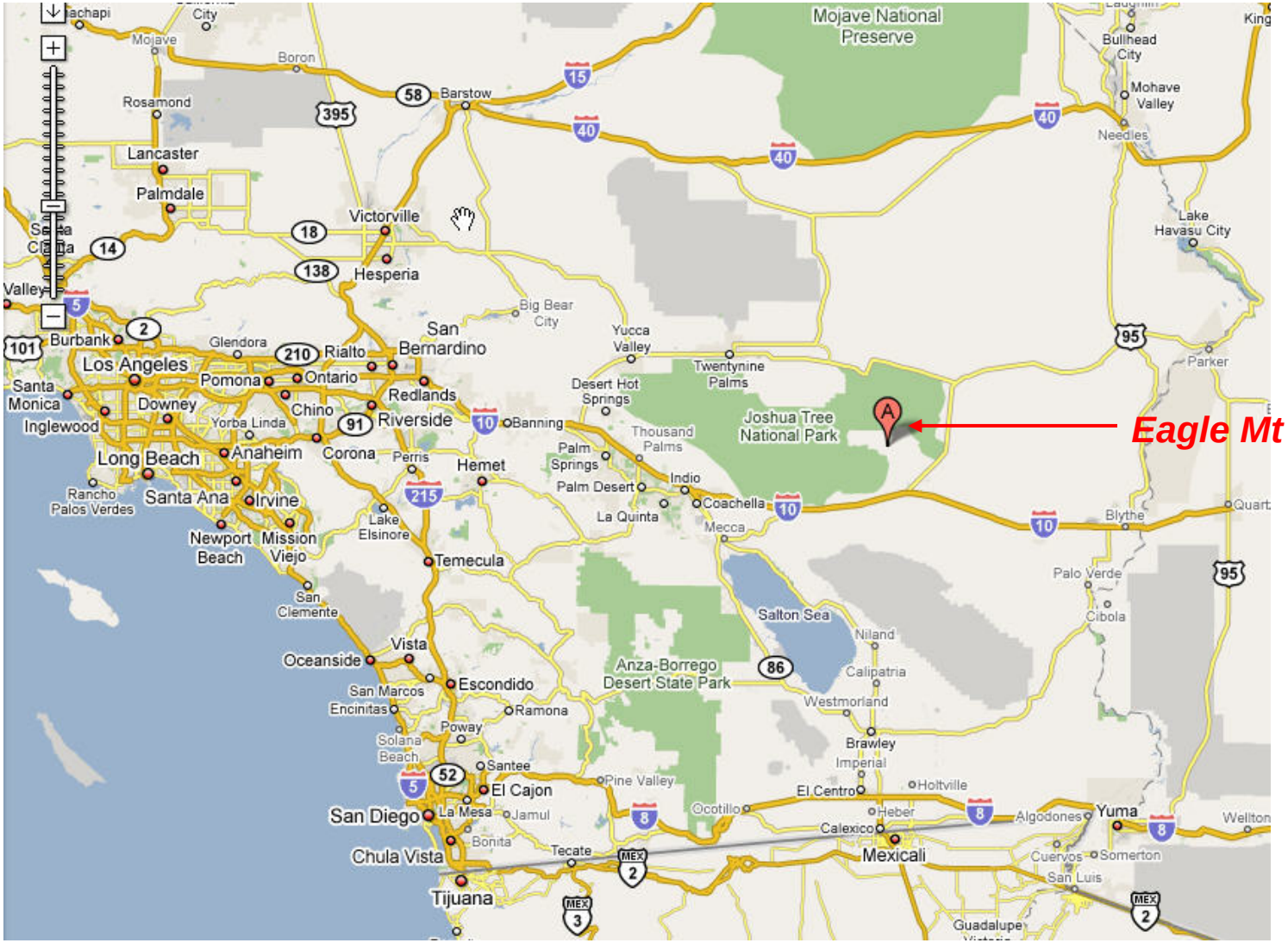
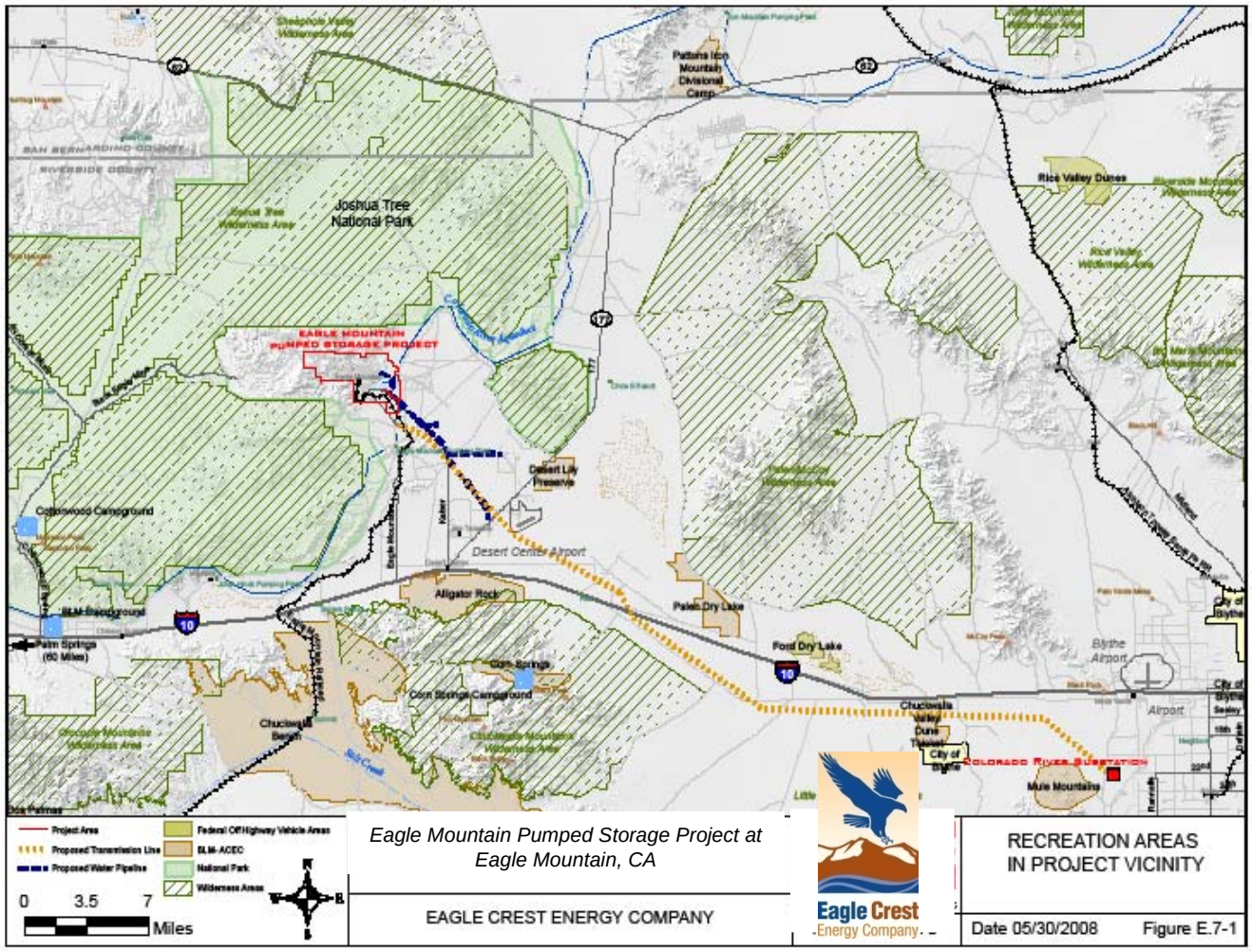
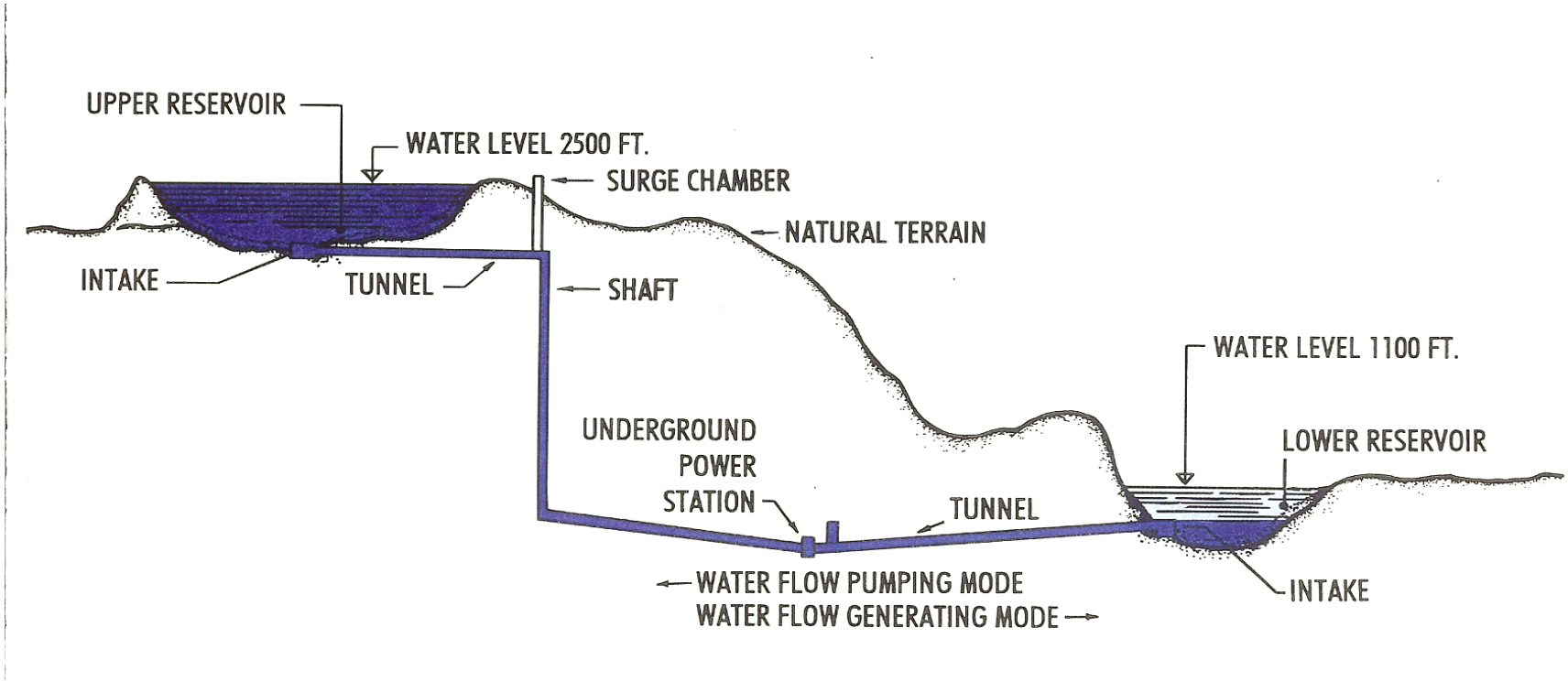
Location Of Eagle Mountain Site



Eagle Mountain's Proposed Transmission Route



Eagle Mountain Schematic



- ***1,400 ft head***
- ***As it is a closed loop, (meaning the reuse of same working fluid), in a remote desert site with no aquatic resource issues. There are no expected plant operation restrictions, such as fish endangerment, water release requirements, recreation use or low flow restrictions from drought.***

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Current Status/Schedule

- January 2008 FERC Filings
  - A PAD (Pre-Application Document)
  - Notice of Intent to File License Application
  - Request for Traditional Licensing Process (TLP)
- March 4, 2008 – FERC approves TLP request
- May 2008 – Valid Interconnection Request in CAISO queue
- June 2008 – Draft License Application to FERC
- June 29, 2008 – FERC Notice Period Ended with No Intervention
- November 2008 – Final License Application to FERC
- FERC license approval expected in 12-18 months
- Estimated Commercial Operation date in 2015 / 2016

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Key Operating Data

• Initial Rated Capacity	1,300 MW
• Number of Units – Variable speed pumps – Designed for quick switch between generation mode and pump back mode	4 @ 325 MW
• Tunnel/Shaft Diameter	35 ft.
• Upper Reservoir Capacity	20,000 ac-ft
• Lower Reservoir Capacity	21,900 ac-ft
• Annual evaporation and seepage is estimated at	2,400 ac-ft
• Head	1,400 feet
• On-Peak Weekday Generation	9 hours
• Off-Peak Daily (7 days/week) Pumping	8 hours
• Cycle Efficiency	80%

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Eagle Mountain Project Benefits

- Compared to most pumped storage projects, the presence of the existing pits/reservoirs will significantly reduce total costs, to (less than $1,000/kW)
- Uses lower cost, off-peak power to store energy for generation during higher cost on-peak hours
- Available on-peak and for emergency response
- Dispatchable -- provides ramping, frequency regulation, minimum load management and operating flexibility
- Pumped storage can convert intermittent renewable resources, such as wind, into firm dispatchable resources.
- Environmental enhancement - No emissions, no interference with aquatic resources (such as fish kills), no endangered species.

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Eagle Mountain Operating Attributes

- Black-start capability
- Rapid ramping
- Voltage and reactive support to the EOR transmission system while operating in the generation mode
- Quick start capability
- Regulation and load following capability
- Complements intermittent renewable resources
- Mitigates minimum load conditions

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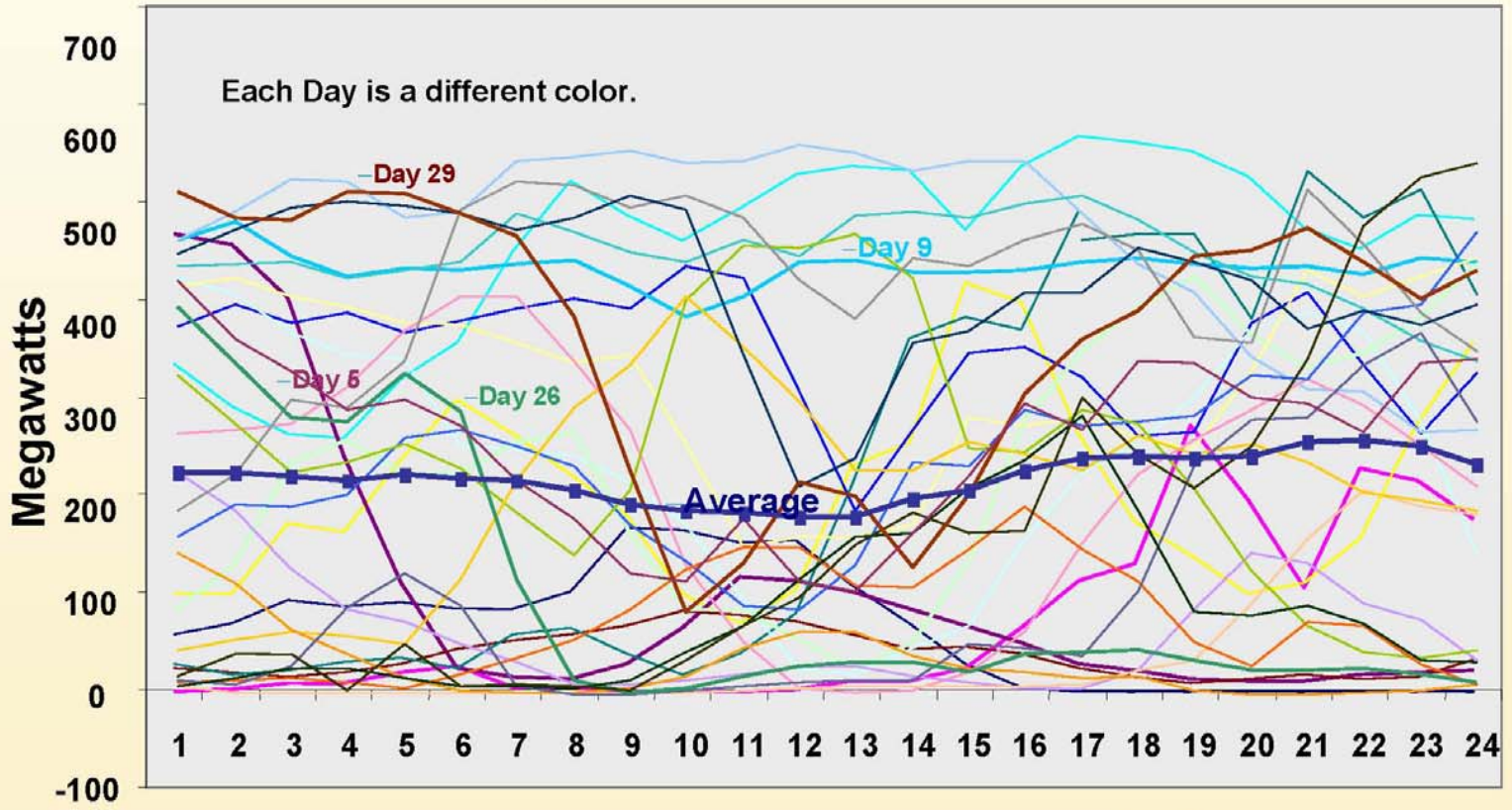
Tehachapi Wind Generation in April – 2005

Could you predict the energy production for this wind park either day-ahead or 5 hours in advance?



14

California ISO
Your Link to Power

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California Energy Commission (CEC) and CAISO Renewable Integration Studies

- CEC Study - July 2007 (GE was primary researcher):
  - California can successfully integrate renewable resources at the mandated 20% level, but will require:
    - Investment in transmission, generation and operations infrastructure to support renewable additions
    - Appropriate changes in operations, policy and market structure
    - Cooperation among all market participants
    - Pursuing generation resources with greater operating flexibility (minimum turndown, quick start, pumped storage)
    - Capability to meet multi-hour load following requirements, example - 3 hour morning load pick-up of 12,000 MW

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California Energy Commission (CEC) and CAISO Renewable Integration Studies (cont.)

- CAISO's Transmission and Operating Issues Study – November 2007:
  - Some of the key recommendations related to future resource requirements to better facilitate renewable integration:
    - Encourage the development of new energy storage technology to facilitate the storage of off peak wind energy for delivery on-peak periods.
    - Include changes in resource adequacy standard to require more generation with faster and more durable ramping capabilities to meet future ramp requirements.
    - Include changes in resource adequacy standard to require additional quick start units that will be required to accommodate hour-ahead forecast errors and inter-hour wind variations.

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Issues and Challenges

- Monetizing operating attributes of Hydro Pumped Storage Projects (HPSP)
- Providing contract certainty – consensus on need for HPSP for renewable resource integration and real time operations management but revenue and contract methods uncertain
  - Utilities vs. CAISO
  - Market based or contract based?
  - Bidding against a peaking resource is undervaluing the HPSP because it provides A/S that a peaking unit can not provide
- Mandating power storage projects to enable intermittent renewable resource integration and provide grid reliability support
- Regulatory and revenue certainty (contracts or tariffs) to promote energy storage project development

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Conclusions

- There is a need for substantial policy consensus on energy storage for integration of intermittent renewable resources
- Technical studies by CAISO, GE and others all point to need for energy storage resources for managing real time operations and reliability
- Energy storage provides the needed operating attributes – load following, regulation, quick start, etc.
- Policy options to consider:
  - Storage portfolio standard of 5%
  - 4 hour resource adequacy capacity procured via long term contracts and long term energy contracts
  - On-call peak energy supply contracts at pre-established price benchmarks (eg,14,000 heat rate times gas index for the day; 400 hours at CAISO ceiling price)
  - Intermittent generation energy firming contracts

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