



22nd ANNUAL MEETING

Electricity Storage: Meeting the Challenges of an Evolving Grid

May 2-4, 2012 ■ Marriott Wardman Park ■ Washington, DC

Financing for Energy Storage Projects

Mark C. Kalpin

WilmerHale

mark.kalpin@wilmerhale.com



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Typical Energy Storage Characteristics

- Up-Front Cost Higher than Traditional Generation
- Lower Operation and Maintenance Cost
- Faster Response Time
- Discharge Duration Varies
- Energy Storage System Types
 - Pumped Hydro, Compressed Air Energy Storage (CAES), Battery Systems, Flywheels, Super Capacitors



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Overview of Financing Opportunities

- Department of Energy Financial Assistance
- Government Incentives
- Classification as Transmission / Distribution Facilities
- Renewable Generation Integration
- Ancillary Services and Other Markets



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Dept. of Energy Financial Assistance

- Smart Grid Demonstration Projects
 - Over \$180M for Smart Grid Projects that include Energy Storage (Battery Systems and CAES)
 - Utility Sponsors include ConEd, Detroit Edison, Duke, NYSEG, National Grid, NStar, PG&E, and SCE
 - Energy Storage System Providers include A123 Systems, Beacon Power, and Premium Power
- Section 1705 Loan Guarantee Program
 - Examples include Beacon Power and Kahuku Wind



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Dept. of Energy Financial Assistance (cont.)

- ARPA-E Program (~ \$49M)
 - Grid-Scale Rampable Intermittent Dispatchable Storage (GRIDS)
 - Agile Delivery of Electrical Power Technology (ADEPT)
 - Batteries for Electrical Energy Storage in Transportation (BEEST)
- Energy Storage Tech. Advancement Partnership



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Government Incentives

- Potential Federal Storage ITC (S 1845 / HR 4096)
- Potential Federal Clean Energy Standard
- Potential Federal Clean Energy Development Bank
- State Incentives (Actual and Potential)
 - Tax Incentives and Tax Increment Financing
 - Inclusion in Renewable Portfolio Standards
 - Inclusion in Utility Rate-Base (HI, TX, CA, NJ)
 - Regulatory Mandates (AS 2514, TX Bill 1421)



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Classification as Transmission/Distribution

- Relieve System Bottlenecks / Avoid System Upgrades
- Single Market Participation: No Cross-Subsidies
- Eligibility for Rate-Based Treatment
- Western Grid Development LLC (FERC, 2010)
 - Energy Storage can be Transmission, based on Function
 - Operation solely for Transmission, and not Energy or Capacity
 - Rate-Base Treatment
 - 100% CWIP; Rate Incentives = 195 Basis Points
 - CAISO 2011 Transmission Plan Rejects all 8 WGD Projects



Classification as Transmission/Distribution

(cont.)

- FERC Order 1000 (2011)
 - Amends Transmission Planning and Cost Allocation Requirements in Order 890
 - Requires Regional Transmission Planning
 - Removes Federal Right of First Refusal for Public Utilities
 - Allows Multi-Value Projects to Recover Costs from Ratepayers on a Regional Basis
 - RTO / ISO Implementation Varies



Renewable Energy Generation Integration

- FERC Overlay
 - Orders 661/661-A (2005): Integration of Large Wind Energy
 - RM10-11 (2011): Integration of Variable Energy Resources
- Opportunities for Short / Medium Duration Storage
 - Management of Ramping Rates
 - Provision of Ancillary Services / Frequency Response
 - Price Arbitrage / Alternative to Peaking Plant
 - Inclusion in Rate-Base under Utility PPA (*e.g.*, HECO)
 - Example Projects
 - Kaheawa Wind, Auwahi Wind, Kahuku Wind, AES Laurel Mountain



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Ancillary Services and Other Markets

- Participation in Ancillary Services Markets
 - Faster / Accurate Response Resources
- Alternative to Conventional Peaking Plants
 - Impact of EPA Air, GHG and Cooling Water Regulations
 - Medium / Longer Duration Resources
- FERC Overlay
 - Orders 890 and 719 (2007/2008)
 - Participation in AS Markets on Basis Comparable to Generation



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Ancillary Services and Other Markets (cont.)

- FERC Orders 755 and 755-A (2011/2012)
 - Two Part Compensation Structure: Pay for Performance
 - Market-Based Capacity Payment to Reflect Opportunity Costs
 - Market-Based Performance Payment to Reflect Accuracy
 - RTO / ISO Implementation Varies
 - Compensation / Qualification / Dispatch / Market Size
- FERC Docket RM11-24-000/AD10-13-000
 - Accounting / Reporting for Electric Storage Technologies
 - *Avista* Restriction Remains on Transmission Provider Procurement of Ancillary Services, and Sales of Ancillary Services between Affiliates, at Market-Based Rates



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Questions?

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