

Comparative Study of Transmission Alternatives

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Overview of Presentation

- Purpose of study
- What are the alternatives to transmission?
- How are alternatives considered now?
- Examples of alternative projects
- Discussion questions for workshop focus:
 - Where in the process should alternatives be considered?
 - What methodology should be used?

Purpose of this Study

- Start a process with an open dialogue
- Obtain Stakeholder input
- Develop a methodology for consideration of non-transmission alternatives to transmission line projects
- Acknowledge jurisdictional and regulatory challenges

Purposes of Transmission Lines

- Provide needed electricity to areas of demand
- Improve system reliability
- Reduce transmission congestion
- Reduce energy costs

Transmission Line Siting Challenges

- Availability of corridors to/through developed areas
- Visual impacts
- Electric and magnetic field concerns
- Other environmental effects

Alternatives to Transmission Lines

- Fossil-fueled power plants
- Distributed generation technologies
- Renewable energy
- Demand management
- Economic incentives

Alternatives to Transmission: Fossil-fueled Plants

- Xx% of State's power
- Gas-fired peaking power plants
 - 50 to 200 MW
- Gas-fired combined cycle power plants
 - 500 to 1000 MW
- Factors to consider:
 - Can be located at load centers
 - Can be difficult to site in developed areas

Alternatives to Transmission: Geothermal Power

- 5% of State's power
- Field sizes up to 100 MW
- Reliable baseload power
- Factors to consider:
 - Geographically limited resource
 - Requires transmission to load centers

Alternatives to Transmission: Wind

- 1.5% of State's power
- Field sizes over 500 MW
- Intermittent power, unsuitable to base load
- Technology improving
- Factors to consider:
 - Geographically limited resource
 - Requires transmission to load centers

Alternatives to Transmission: Hydroelectric Power

- 15% or 26%?? of State's power
- Project sizes up to 400 MW
- Factors to consider:
 - Geographically limited resource
 - Requires transmission to load centers
 - Unlikely that new facilities will be permitted

Alternatives to Transmission: Solar Thermal Power

- Several design options
- Peaking power generation
- Factors to consider:
 - No new California plants since 1988
 - Geographically limited for best resource value
 - Requires transmission to load centers

Alternatives to Transmission: Tidal Power

- No current production in California
- Projects up to 240 MW (France)
- Factors to consider:
 - Coastal California includes large population centers
 - Potential high cost
 - Impacts on marine resources

Alternatives to Transmission: Biomass

- Over 2% of State's power
- Burning organic fuels to generate up to 10 MW
- Factors to consider:
 - Availability of fuels
 - Air quality impacts

Alternatives to Transmission: Distributed Generation

- Fuel cells
- Solar photovoltaics
- Electricity storage
- Factors to consider:
 - Small scale
 - Developing technologies
 - Can defer need for new transmission
 - Economic and regulatory concerns

Alternatives to Transmission: Demand Management

- Conservation
 - Building and appliance standards for energy efficiency
 - Consumer conservation
- Load shedding
 - Rotating outages
 - Voluntary or mandatory
- Load shifting
 - Peak to off-peak energy usage

Alternatives to Transmission: Economic Incentives

- Reliability must-run obligations
- Congestion fees
- Fees for transmission losses or access

Alternatives to Transmission: Conclusion

- Best alternatives to transmission:
 - Gas-fired power plants if properly located
- Geographic constraints (requiring add'l transmission):
 - Wind, geothermal, hydropower, solar thermal, tidal
- Alternatives as components of portfolio or to defer transmission timing:
 - Solar PV, fuel cells, economic incentives, demand management

Current Transmission Project Evaluation Process

1	Year 0-1	IOU Annual Trans. Grid Expansion Plan
2	Year 1-2	CAISO Annual Controlled Grid Study
3	Year 1-2	CAISO determines need
4	Year 2-3	IOU prepares CPCN and PEA
5	Year 3-4	CPUC: CPCN & CEQA processes
6	Year 4	CPUC issues CPCN
7	Year 4	IOU final design and permitting
8	Year 5	IOU constructs project

Transmission Project Example: Jefferson-Martin

- 19xx: SF Long Term Study identified need and alternatives for meeting need
- 19xx: SF Long-Term Study identified JM as preferred solution
- 19xx-200x: PG&E prepared CPCN/PEA
- Oct. 2002: PG&E submitted CPCN to CPUC
- 2003: CPUC CEQA process (Draft & Final EIR)
- Jan. – Feb. 2004: CPUC Evidentiary hearings
- June 2004: Draft Decision
- July 2004: CPUC vote

CEQA Requirements for Alternatives

- Consistency with project objectives
 - Must meet “most” project objectives
- Feasibility
 - Economic, environmental, legal, social, technological factors
- Potential to eliminate significant environmental effects

Alternatives Considered in Jefferson-Martin EIR

- Alternatives fully analyzed:
 - Overhead & underground route options and transition station options
 - Based on land use concerns
- Alternatives eliminated based on CEQA criteria:
 - New generation (Potrero Unit 7, San Francisco Williams Turbines)
 - Renewable resources (solar, wind, and tidal)
 - System enhancement (distributed generation and demand-side management)
 - Integrated Resource Alternatives

Transmission Alternatives Examples: Tri-Valley RFP

- January 2000 CAISO RFP for peaking power
- PG&E Tri-Valley 2002 Capacity Increase Project proceeding in parallel
- 4 responses submitted:
 - Combinations of combustion turbines, solar photovoltaics, load management, and transmission system enhancements
- ISO found alternatives not cost-effective as alternatives to transmission

BPA's Non-Wires Initiative

- Non-wires Round Table formed in 2003
 - http://www.transmission.bpa.gov/PlanProj/Non-Construction_Round_Table/
- May 2004 newsletter “Non-Wires Solutions Update” at:
 - http://www.transmission.bpa.gov/PlanProj/Non-Construction_Round_Table/NonWireDocs/504Newltr.pdf

BPA's Non-Wires Initiative

- Purpose:

BPA is facing challenges of an aging transmission system that is stretched to its limits in meeting today's demand. Before deciding to build a new line, BPA wants to fully consider non-construction alternatives, including energy efficiency programs, demand reduction initiatives, pricing strategies, and distributed generation.

BPA's Non-Wires Initiative (1 of 2)

- Load reduction pilot
 - Voluntary demand reduction using Internet-based trading platform and hourly price postings
 - Pilot allowed purchase of 22 MW (one year's load growth in area)
- Direct load control pilot
 - Allows residential and commercial load-shifting to reduce cost and peak load
 - Commercial consumers get reduced demand charges
 - Residential customers get utility rebates

BPA's Non-Wires Initiative (2 of 2)

- Distributed generation aggregation pilot
 - Investigating major consumer willingness to use DG on an emergency basis
 - Day-ahead notice to be provided
- Load reduction and distributed generation pilot
 - Installation of remotely accessible load-shedding equipment
 - Testing of how long major facility loads can be shut down
 - Installation of microturbine with remote-access control in commercial building

Where in the process to consider non-transmission alternatives?

- Looking for input on:
 - Use of existing process and at what points these alternatives can be considered
 - Ideas for a revised process that would better allow consideration of alternatives

What methodology should be used to evaluate alternatives?

- Looking for input on:
 - Planning stage methodologies
 - CEQA process methodologies

Where do we go from here?

- Review workshop input and written follow-up information
- Prepare summary paper
- Additional workshop in future?
- Coordinate with 2004 and 2005 IEPR Updates