Renewable Transmission:
Rights, Wrongs and Conflicts…
Access, Pricing, Jurisdiction or Goals?

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The Driver is Climate Change

• The U.S. must transform the way we power the world’s largest economy
• Global temperature increases must be kept to one degree Celsius if possible (450 ppm CO2)
• Four – five degrees worst case scenario (≈ warming since last Ice Age)
• Benefits of early action far outweigh costs
  (Stern Review)
Consequences are Severe

• One in 20 people could be displaced by rising sea levels
• One-third of world's species face extinction (IPCC)
• Poorest nations face the earliest and most disastrous consequences, least ability to adapt
• Climate refugees and resource conflicts

“The maps of the world will have to be redrawn.”

• Sir David King,
  – U.K. Science Advisor, in regard to what is happening in Greenland
Developed Nations Must Lead

- Largest contributors
- Access to technology and innovation
- Challenges convert to opportunities
- Experience with large-scale economic transitions
- Dislocations globally disrupt all economies
- Models for alternative development

Note: Totals may not equal sum of components due to independent rounding. Source: Energy Information Administration. *Electric power sector only.
Role of Renewables

- Driver is climate change then relative cost v. benefit must take carbon reduction into account
- Coal largest CO2 contributor in sector
- Cannot afford new coal
- Must phase out existing coal
- Time is of the essence
- Renewables the obvious answer

Obstacles to renewable transition

Risk Factors for 2010 RPS Generation

Note: California has little control over this barrier
Obstacles to Renewable Transition

- Cost inflated due to lack of carbon pricing
- Remote from load centers
- Intermittency and integration concerns
- Concerns over land use in siting and transmission
- Without protections, backsliding on Carbon likely
- BAU planning and siting frustrates national goals

Environmental Dispatch, Interconnection Stds.

- To prevent carbon backsliding
  - Prevent new high carbon interconnections (Western US)
    - GhG interconnection std – fuel neutral?
  - Prioritize grid enhancements for renewables
  - Dispatch low-carbon resources first
    - Cost distorted by lack of carbon cost
    - General grid upgrades allow for increases in CO2 from existing sources.
Intermittency – how serious a problem?

• Firming can be done with other renewables
  – Wind with wind
  – Wind with solar
  – Solar with wind
  – Wind and solar with geothermal and hydro, biomass
  – Storage
• Firming with natural gas

National Benefits, Cost Allocation, Priority

• Business as usual planning and cost recovery geared to territory needs
• Renewable planning and cost recovery should be interconnection focused
• Cost recovery should be interconnection focused
• Need for lines tied to national GhG reduction goals
• Cannot afford to lose ground on carbon
• Time is of the essence.
Interconnection Planning

• Involves key stakeholders up front
• Identify development zones with few conflicts
• Design needed transmission to the zones
  – Do generation and tx planning co-contemporaneously
• Lines identified as needed in the plan prioritized and federally authorized
• Siting to states or with state conditions, FERC fall-back

Key stakeholders

• LSEs and utilities
• Independent transmission sponsors
• Federal agencies
• State regulators
• Local and county governments
• Tribal Governments
• Environmentalists
• Planning entities and sub-regional planners
Siting considerations – key to speed

- Avoid all designated protected areas
- Plan for ecosystem resiliency
- Build what is needed and plan for expansion
- Scalable transmission
- Make full use of designated ROWs and existing infrastructure
- Agencies must collaborate – fed with fed, states with fed.

Interconnection priority

- National priority means accelerated deployment
- Renewables move to front of line
- Renewables displacing coal go first
  - i.e. Mojave generating station, Laughlin, NV.
- Phase out worst polluters first allowing for wheeling of remote renewables and less-polluting conventional resources
- Use system capacity for distributed integration too.
- Accelerate Energy Efficiency to reduce infrastructure needs
For More Information

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