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RENEWABLE ENERGY AND TRANSMISSION: OPPORTUNITIES AND BARRIERS

EESI Briefing

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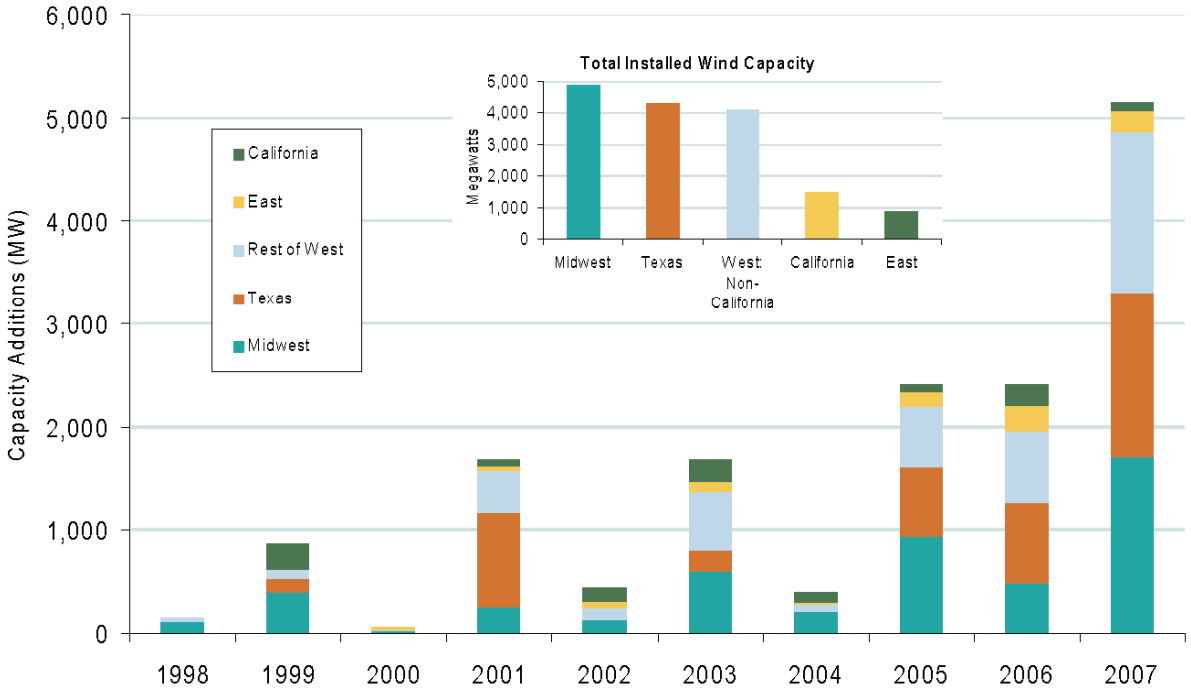
OVERVIEW: RENEWABLE ENERGY & TRANSMISSION NEEDS

- Renewable energy is often located in remote areas far from major market centers
- Planning and building transmission for renewables is time consuming, risky and expensive
- For these reasons the country needs:
  - A coordinated State/Federal policy on siting and developing transmission for renewable energy in a reasonable timeframe
  - Reform of the generation interconnection queue to make the process more efficient, and
  - Reform of the requirement that generators finance transmission expansions

GENERATION INVESTMENT

- Installed renewable generation has increased substantially during the past few years



Midwest includes: Il, IA, KS, MI, MN, MS, NE, ND, OH, OK, SD, WI
East includes: ME, MA, NH, NJ, NY, PA, RI, TN, VT, WV

Source: American Wind Energy Association (AWEA)

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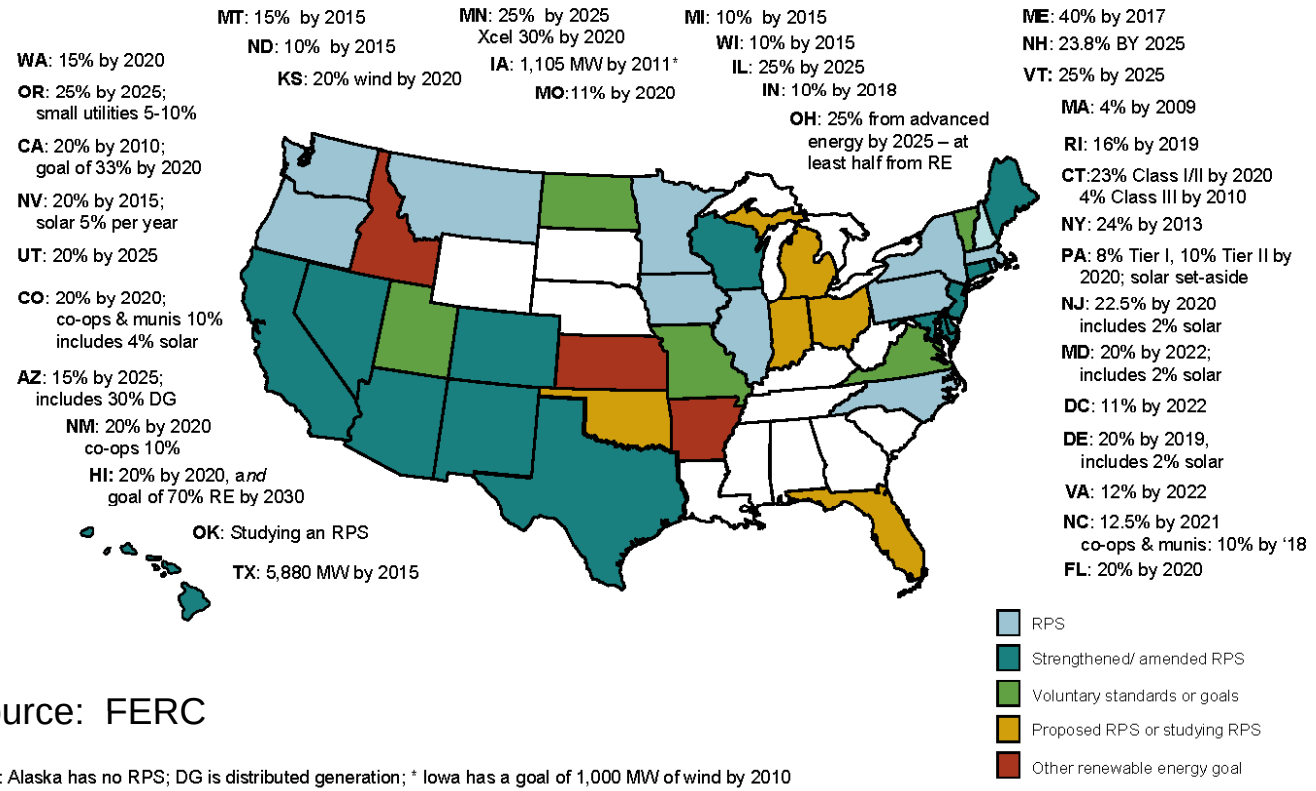
STATE RPS TARGETS

- State renewable portfolio standard targets are further driving the demand for renewable energy sources



Source: FERC

Notes: Alaska has no RPS; DG is distributed generation; * Iowa has a goal of 1,000 MW of wind by 2010
Sources: Derived from data in: EEI, EIA, LBNL, PUCs, State legislative tracking services, Database of State Incentives for Renewables and Efficiency, and the Union of Concerned Scientists.

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CURRENT RENEWABLES INVESTMENTS

- Renewables have a long way to go to displace fossil fuels and meet RPS targets

RTO/ISO	Total Generation in Service	Coal	Gas	Oil	Dual Fuel (oil/gas or coal/gas)	Hydro	Nuclear	Wind/ Biomass/ Geothermal	Other	Import/ Unknown
CAISO	55,000 MW	0%	38%	0%	0%	15%	13%	5%	4%	25%
ISO New England	30,879 MW	9%	40%	22%	0%	11%	15%	3%	0%	0%
Midwest ISO	127,000 MW	52%	23%	3%	6%	5%	8%	2%	1%	0%
New York ISO	38,966 MW	14%	13%	<1%	25%	17%	28%	<1%	2%	0%
PJM Interconnection	163,498 MW	39%	16%	9%	10%	5%	19%	<1%	2%	0%
SPP	50,392 MW	43%	42%	2%	6%	4%	1%	0%	2%	0%

BUT, RENEWABLES ARE CATCHING UP

- In 2007, wind energy represented about 30% of all new generation coming on line
- Currently, wind, solar and other renewable resources dominate the interconnection queues, particularly in the Midwestern and Western regions and New York

RTO/ISO	Size of Interconnection Queue: # of Requests	Size of Interconnection Queue: MW	Total Peak Demand	Total Generation in Service
California ISO	265	77,614 MW (>66% renewable)	50,270 MW	55,000 MW
ISO New England	104	13,400 MW	27,360 MW	30,879 MW
Midwest ISO	348	80,000 MW (80% wind)	109,157 MW	127,000 MW
New York ISO	138	26,000 MW (>62% wind)	33,939 MW	38,966 MW
PJM Interconnection	360	84,164 MW	144,644 MW	163,498 MW
Southwest Power Pool	106	26,811 MW (>90% wind)	43,304 MW	50,392 MW

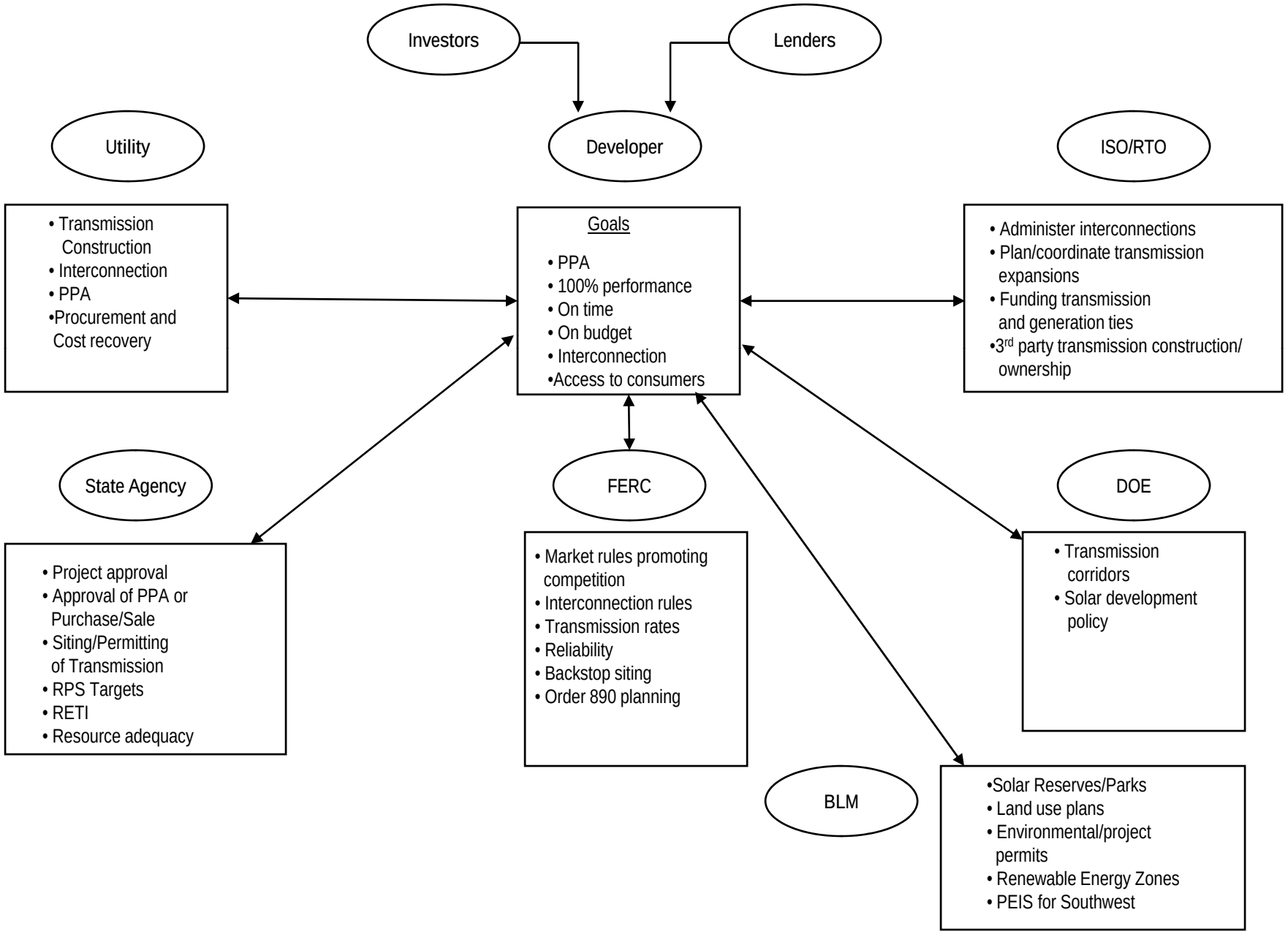
NEED FOR TRANSMISSION TO ACCESS RENEWABLE GENERATION

- Renewable energy projects (*e.g.*, wind, solar, geothermal) normally locate in remote areas and require long transmission lines to reach markets
- Transmission siting, permitting and construction is a long, risky process, sometimes with enormous costs
- California's Tehachapi transmission project will connect 4,500 MW of wind energy (nearly 10% of California's peak demand)
- Tehachapi will cost about $1.7 billion

STATE – FEDERAL ISSUES

- Multiple state and Federal approvals add to risk and delay
- Some states are working to streamline transmission planning by creating renewable energy zones
- BLM is working to streamline transmission siting and permitting on Federal land through coordinated permitting and environmental impact statements
- But, we need to do more

Siting and Approval Challenges With Renewable Projects



INTERCONNECTION PROCESS & COST ALLOCATION

- Multi-month interconnection studies to determine system impacts and estimate transmission costs contribute to risk and delay
- If interconnection requests require upgrades, the generator triggering the expansion can be required to pay all or most of the costs up-front ("participant funding")
- Financing costs can range from a few million to tens of million of dollars
- Generators are repaid over a period of 5-20 years, but this does not start until the project achieves commercial operation — which takes 3-5 years or more

COST ALLOCATION & QUEUE ISSUES

- Generators with substantial upgrade costs may withdraw from the interconnection queue
- When this happens, lower queued projects are restudied
- Queue reshuffling leads to more delays
- Generators risk meeting milestones in power sales contracts, lose revenues and continue to incur financing costs
- The Midwest Independent Transmission System Operator — which operates the power grid in a large part of the Upper-Midwestern US — estimates that it will take until 2050 to complete studies of generation in the existing queue

TRANSMISSION PLANNING

- Transmission is planned and built through regional planning processes, and generally not as a result of interconnection studies
- Facilities identified through interconnection studies are introduced into the comprehensive transmission plan in the next year
- The plan may identify different transmission facilities from those identified in the interconnection study
- The comprehensive transmission plan can add a year or more before transmission projects can move to the state siting and permitting process

TRANSMISSION COST IMPLICATIONS

- Participant funding increases developer risk and raises costs to consumers
- Renewable energy developers are at risk for transmission upgrade costs until the transmission is built, their plants go into commercial operation, and the utility begins to refund the investment
- Consumers pay more because:
  - They pay twice — once when the generator finances the project (and factors the cost into its sales contract with the utility), and again when the utility rolls the costs into its transmission rates
  - Developer cost-of-capital is generally higher than for utilities, which drives up costs to consumers

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TRANSMISSION COST ISSUES, cont.

- The goals of generation funding policies are to:

  (1) encourage generators to make efficient siting decisions, and

  (2) address concerns that generators may cause local customers to pay for transmission to allow the generator to export energy

- These concerns do not apply to renewable energy because:

  (1) renewable energy meets state RPS requirements

  (2) greenhouse gas reduction is a national benefit, and

  (3) concerns about generator siting can be addressed through earnest money deposits that are refundable when the project achieves commercial operation

TRANSMISSION COST ISSUES, cont.

- Transmission owners are better-positioned to bear the financing risk:
  - They can recover the cost of upgrades through transmission rates after the plant goes into service
  - FERC ratemaking allows transmission owners to recover their construction-related costs as they are being incurred — which developers cannot

CONCLUDING THOUGHTS

- Coordinated State/Federal policies on transmission is critical to developing renewable energy to meet state RPS goals and timelines
- The interconnection queue process must be reformed to bring renewable projects on line quickly
- The costs and risks of new transmission for renewables should be spread beyond generation developers because society as a whole benefits from greenhouse gas reduction and reduced dependence on imported fuels

QUESTIONS?

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