Allocation of Risk in the Development of Large Scale Renewable Transmission Projects

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Where will Renewable Supply Show Up and How Much? – Close-to-Load vs. Remote Generation

- Not likely to be mutually exclusive – plenty of need for renewable power for the foreseeable future for both local and remote renewables
- Close-to-load generation may not be adequate to meet goals and does not offer economies of scale of remote renewable generation
- Could rely on natural gas close to load showing up and pay Alternative Compliance Payments but how much gas generation is really expected?
- There are risks associated with uncertainty over emissions costs and relying on low-emission generation close to load just as there are with projected transmission benefits
- Could wait for the other guy to build and pay for the transmission and free-ride off of it but he's thinking the same thing

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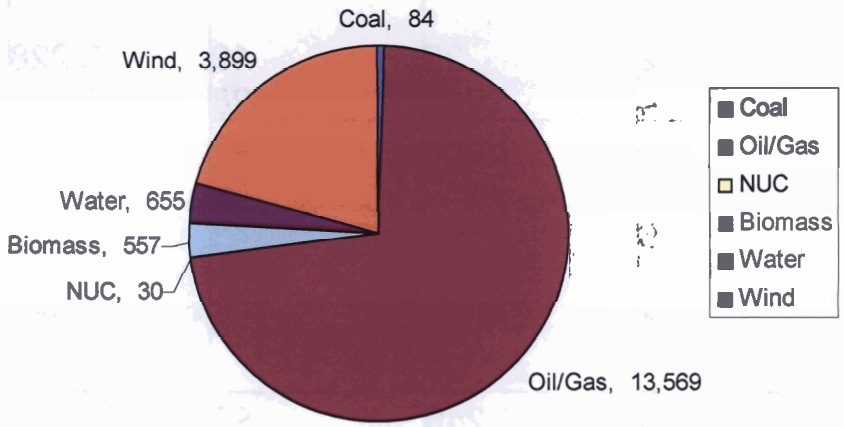
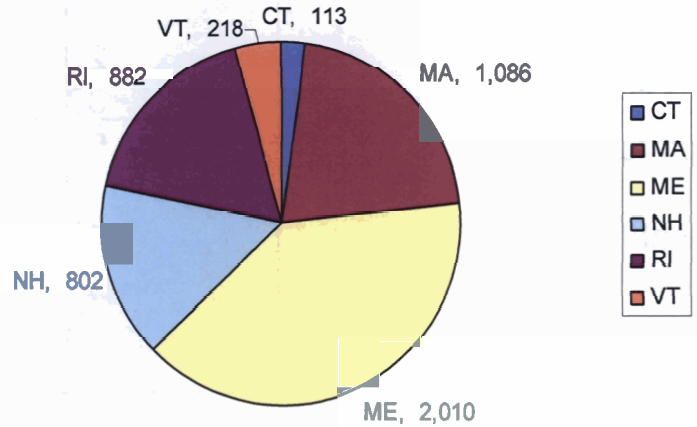
Capacity Additions In ISO-NE Queue - Predominately Gas Fired with Renewables Concentrated in North

ISO-NE Capacity Additons by Fuel Type through 2014 Based the Interconnection Queue (MW)



ISO-NE Renewable Capacity Additions by State through 2014 Based on the Interconnection Queue (MW)



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ISO-NE New Generation Projections Through 2014 by Fuel and Probability

New Generation Projection by Fuel Type

Fuel Type	Total		Green		Yellow	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
Natural Gas	21	3,253	2	25	19	3,228
Natural Gas/Oil	32	6,928	4	999	28	5,929
Subtotal	53	10,181	6	1,024	47	9,157
Renewable	49	3,372	6	152	43	3,220
Other	9	829	1	70	8	759
Total	**111**	**14,382**	**13**	**1,246**	**98**	**13,136**

Presented by Vamsi Chadalavada, Senior Vice President and COO, ISO New England at the NPC Meeting 1 August, 2008.

Green denotes projects with a high probability of going into service
Yellow denotes projects with a lower probability of going into service or new applications

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Barriers to Remote Renewable Resources

- **Initial entrants in resource-rich areas are often too few to fund a long-distance transmission line whose size is efficiently tailored to capture potential new entry**
  - Even if they could fund it, initial entrants do not want to subsidize competitors who come later
- **Transmission siting and permitting processes takes years and costs millions yet renewable generators often have no native load to recover costs if the project is ultimately not approved**
- **Chicken and egg problem – suppliers cannot contract with load with no credible means of delivery but cannot take risk on developing means of becoming deliverable without a contract**

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The California ISO Approach

- **Initially allocate trunkline costs broadly to load on a socialized basis**
- **Then shift costs to generators as they interconnect**
- **Risks to load of generation not showing up is mitigated by two central features of this approach**
  - Transmission facilities only eligible for this rate treatment if building out to an Energy Resource Area designed by the CA PUC
  - Strong demonstration of commercial interest from generators constituting 60% of the line's capacity must be established
- **Load still backstops all risk during the entire development phases of the project**

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Bounding Development Risk to Load of Long-Distance Transmission

- Lead times for transmission often longer than for generation
- When expected generation is critical to cost/benefit analysis, this introduces a risk to load
- However transmission development costs are generally back-loaded
- Once the transmission project begins to look "real", generators may respond to Request For Proposals ("RFPs") for Purchase Power Agreements ("PPAs") with relative assurance of a means of delivery
- Once PPA is secured, generators can assume development risk of pro rata share of the project under a modified CA rate treatment
- Second half of development period is when costs ramp up dramatically
- If new entry does not occur sufficiently enough or early enough in the development period, project can be stopped before substantial costs are at risk to load
- Allocation of relative small portion of development risk to load addresses chicken and egg problem while exposing load to a fraction of the overall project costs

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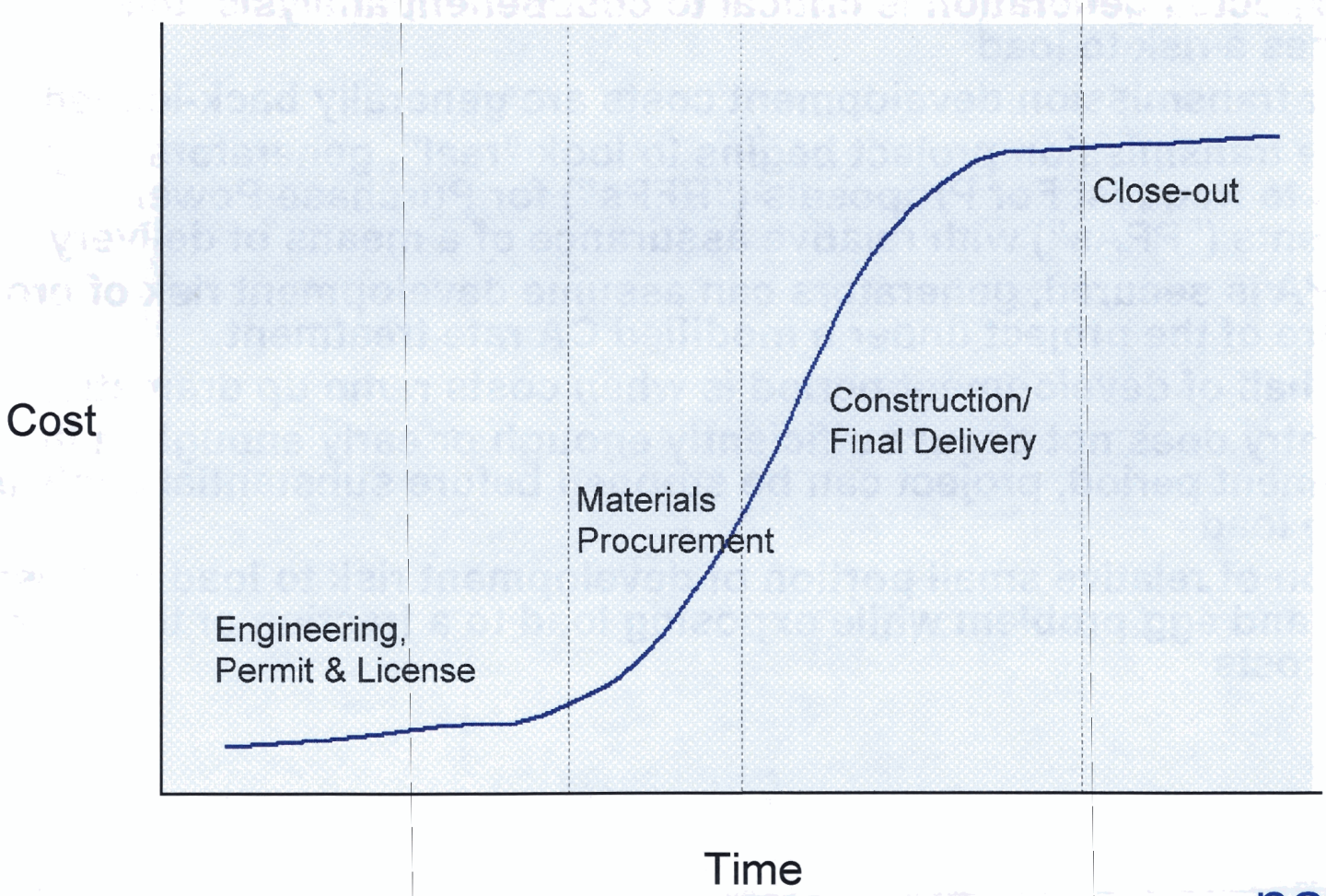
Classical Cost Curve for Transmission Project



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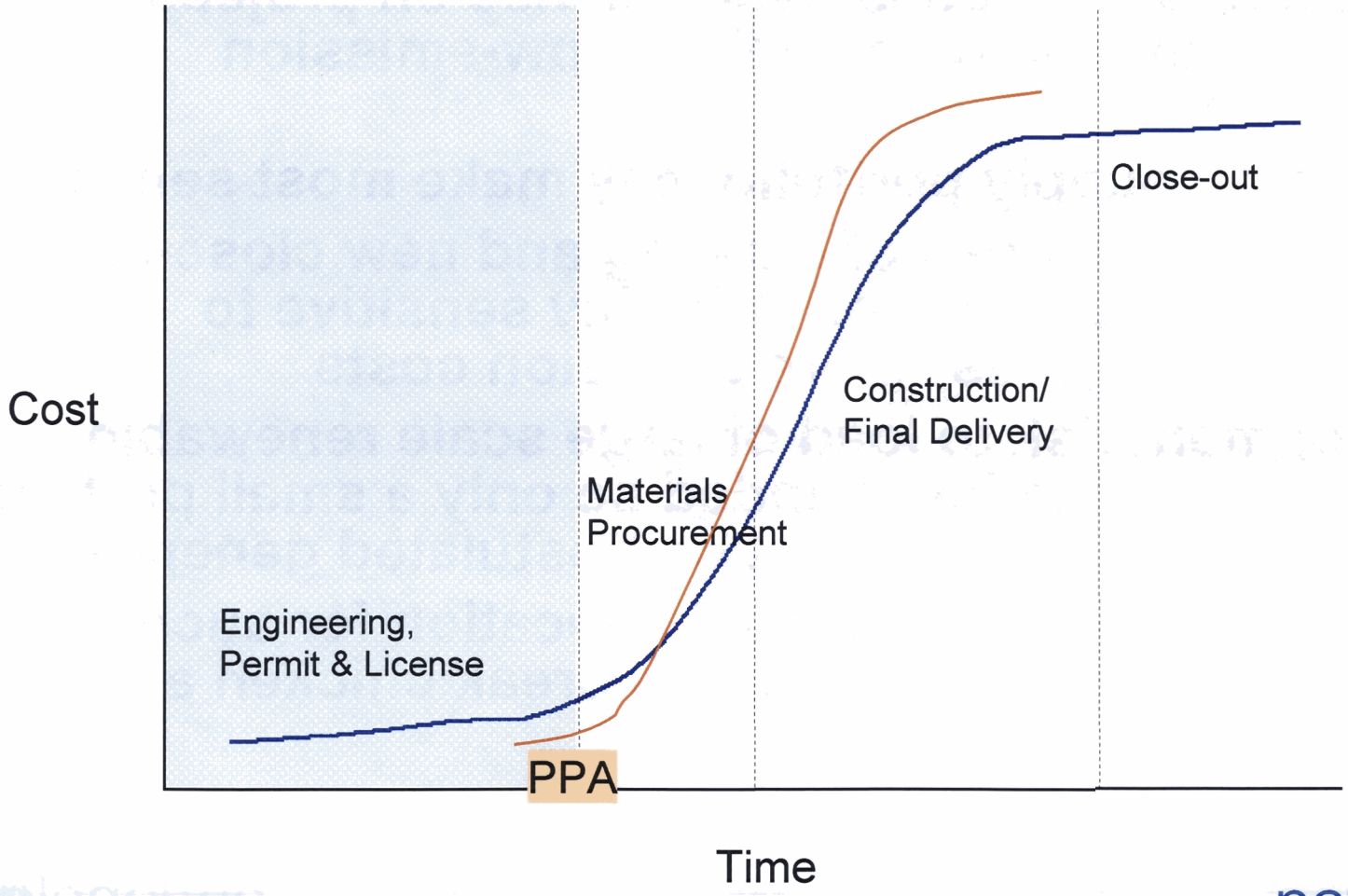
Sharing of Risk for Transmission Projects



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Conclusions

- Long distance renewable transmission entails risks to customers but so does over reliance on projections for new close-to-load renewable or low-emission generation
- A balanced supply portfolio may make most sense
- The competitiveness of existing and new close-to-load low-emission generation is highly sensitive to uncertainty regards future emission costs
- Development risk to load of large scale renewable transmission can be bounded so only a small portion of the costs are dependent on postulated generation
- Alternatives methods of cost allocation for such projects merit consideration to break chicken and egg problem

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Questions

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