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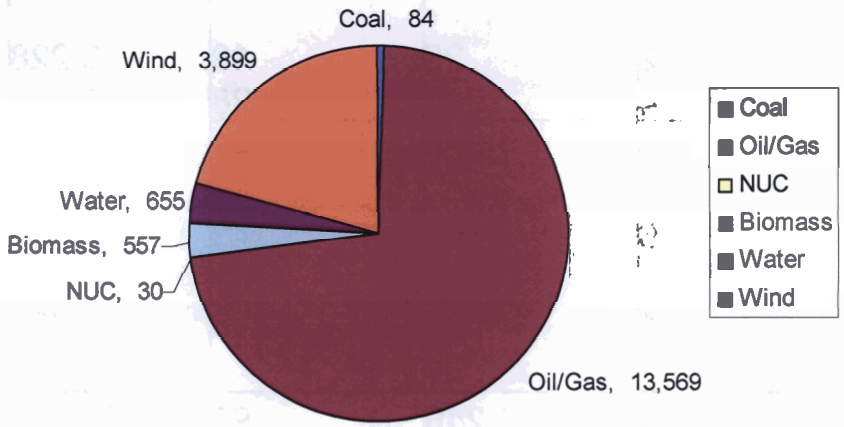
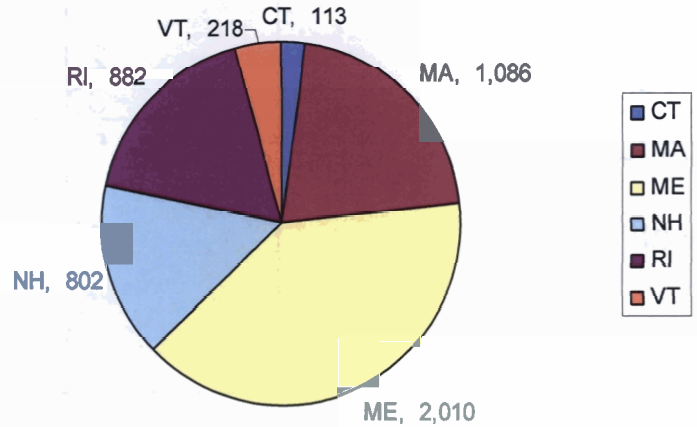
# Capacity Additions In ISO-NE Queue - Predominately Gas Fired with Renewables Concentrated in North

**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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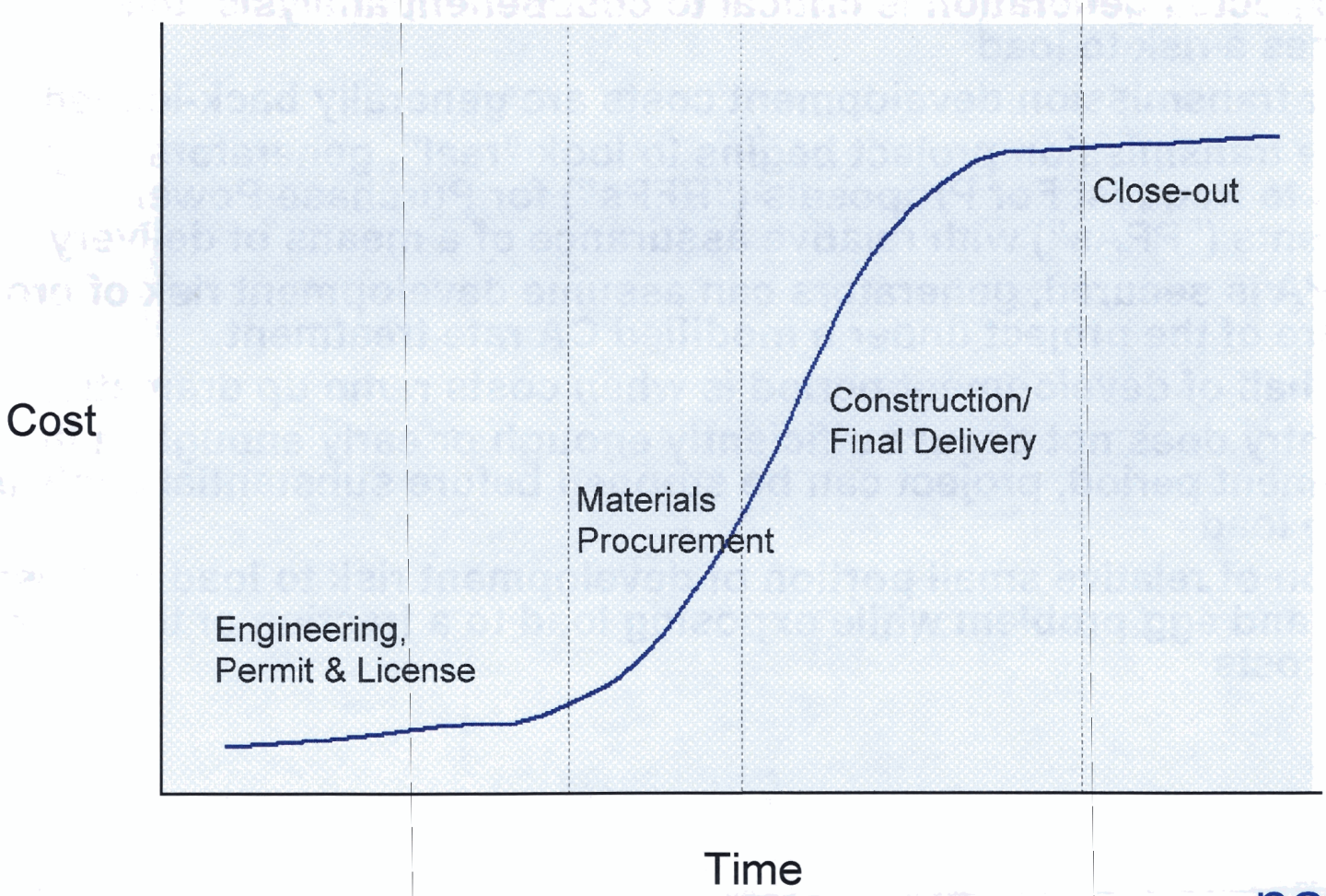
# Classical Cost Curve for Transmission Project

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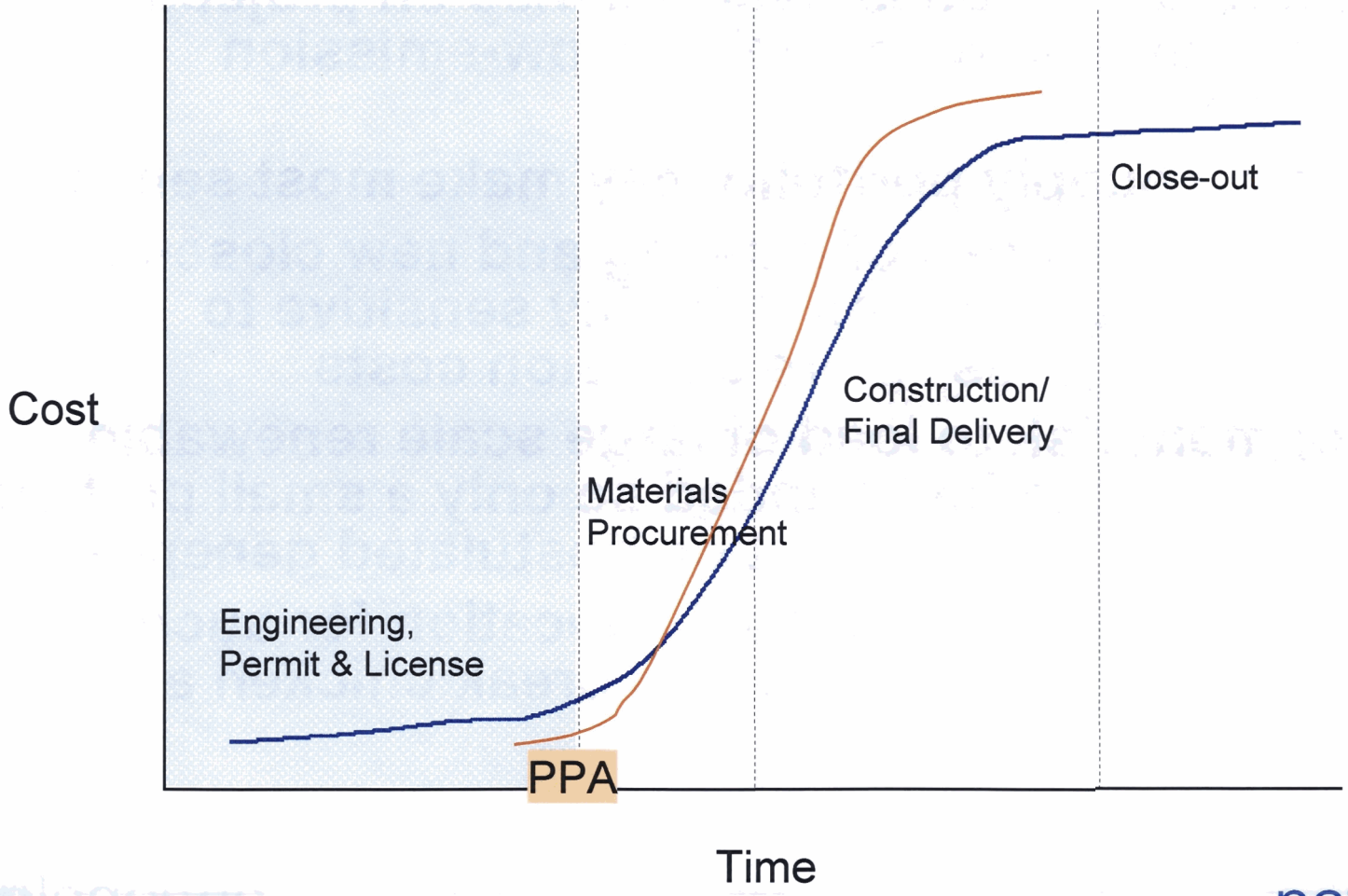
# Sharing of Risk for Transmission Projects

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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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