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# Review of Thailand Power Development Plan 2010

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# Outline

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- **One Recurring Observation**
- **One Overall Recommendation**
- **Three sub-Recommendations**
- **Specific Examples from the PDP 2010**
- **Summary and Conclusion**



# One Recurring Observation

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- The Thailand PDP 2010 presents a single resource plan (i.e., portfolio of resources) that was developed around a single scenario (i.e., set of assumptions) about the future.
- This observation is at the core of many of our questions about the PDP 2010.
- We will get to specific examples...



# One Overall Recommendation

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- Ask the EGAT to present multiple resource plans that have been evaluated under multiple scenarios of the future in the next PDP.
- Recognition that the future is uncertain.
- Recognition that avoiding bad outcomes is important.
- Consideration of multiple plans and multiple scenarios leads to three slightly more specific recommendations...



# Specific Recommendations

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1. **Work with EGAT to establish objectives and standards for distinguishing good resource plans from bad plans.**
  - **Low-cost, low-risk, low carbon emissions, high-reliability, etc. are all important objectives.**
  - **Satisfying these objectives likely requires making tradeoffs.**
  - **Judgment is necessary; but setting a standard helps focus the selection of a final resource plan.**
  - **In Oregon IRP: Select the resource plan with the best combination of expected cost and associated risks for consumers.**



## Specific Recommendations (cont.)

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2. Ask EGAT to fully consider risk and uncertainty.
  - Must evaluate all candidate plans using multiple scenarios of the future.
  - In Oregon IRP: Electric utilities must address the following sources of risk and uncertainty: load requirements, fuel prices, electricity prices, hydro conditions, plant forced outages, and costs to comply with future regulation of greenhouse gas emissions.
  - Must establish metrics for measuring risk.



## Specific Recommendations (cont.)

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3. Encourage EGAT to evaluate all resources (both demand- and supply-side) on a consistent and comparable basis.
  - When possible, avoid fixed inclusion of resource levels or targets established outside of the plan.
    - Leaves the impression that certain resources are being favored without justification.
    - Results in a lack of analysis of the contribution of the targeted resources to the objectives of the plan.



# Resource Selection in PDP 2010

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- Section 3.8 of the PDP discusses resource priorities, precedence, and optimization.
- “Optimization” suggests that a cost minimization standard may have been used, but the PDP lacks any discussion of the cost of the plan. Or the cost of alternative plans.
- Optimization seems to be limited to the choice between nuclear and coal-fired power plants, since:
  - RE is fixed (outboard from AEDP)
  - NG is fixed (new plants = retiring plants)
  - VSPP is fixed (netted in the load forecast)
  - DSM is fixed (one program T5 for T8 lamps)





## Resource Selection (cont.)

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- How would a plan with more renewable energy perform? How much would it increase cost? How much would it reduce carbon emissions?
- How would a plan with more natural gas-fired resources perform? Would it lower costs under most scenarios of the future?
- Does the plan pursue all cost-effective DSM? How would a plan with more DSM programs perform? Would it lower costs and fuel price risk under most scenarios of the future?



# Load Risk in PDP 2010

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- Section 4 of the PDP indicates that available load forecasts included Low, Base, and High cases.
- Section 3.6 of the PDP indicates that the plan was developed around the single Base Case forecast.
- Are the Low, Base, and High cases equally likely?
- How would the developed plan perform under the Low Case scenario? What is the cost of the higher level of reliability?



## Fuel Price Risk in PDP 2010

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- Section 9.2 of the PDP indicates that fuel price risk was an important consideration in selection of the nuclear resources.
- But, the PDP provides no indication of how fuel price risk was considered.
- Renewable and DSM resources have low fuel price risk.
- Could a plan with more renewable and DSM resources achieve the same mitigation of fuel price risk at a lower overall cost?

# Reliability in PDP 2010

- Reliability is the risk of unserved energy.
- Section 9.2 of the PDP indicates that reliability was an important consideration in selection of the nuclear resources.
- Section 3.4 of the PDP indicates that dependable capacity is an important consideration is the selection of renewable resources.
- But, the PDP provides no indication of how reliability was considered.
- Did the plan consider both forced outage rates and the size of the generating units (i.e., single shaft risk)?
- How is reliability related to the reserve margin requirements discussed in Section 3.1?



# Summary of Recommendations

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- Ask the EGAT to present multiple resource plans that have been evaluated under multiple scenarios of the future in the next PDP.
- Work with EGAT to establish objectives and standards for distinguishing good resource plans from bad plans.
- Ask EGAT to fully consider risk and uncertainty.
- Encourage EGAT to evaluate all resources (both demand- and supply-side) on a consistent and comparable basis.



# Thank YOU

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