# Transitions to a 21st century generation system

## EUCI Annual Hawaii Power Summit

December 3rd, 2014

Bruce Biewald

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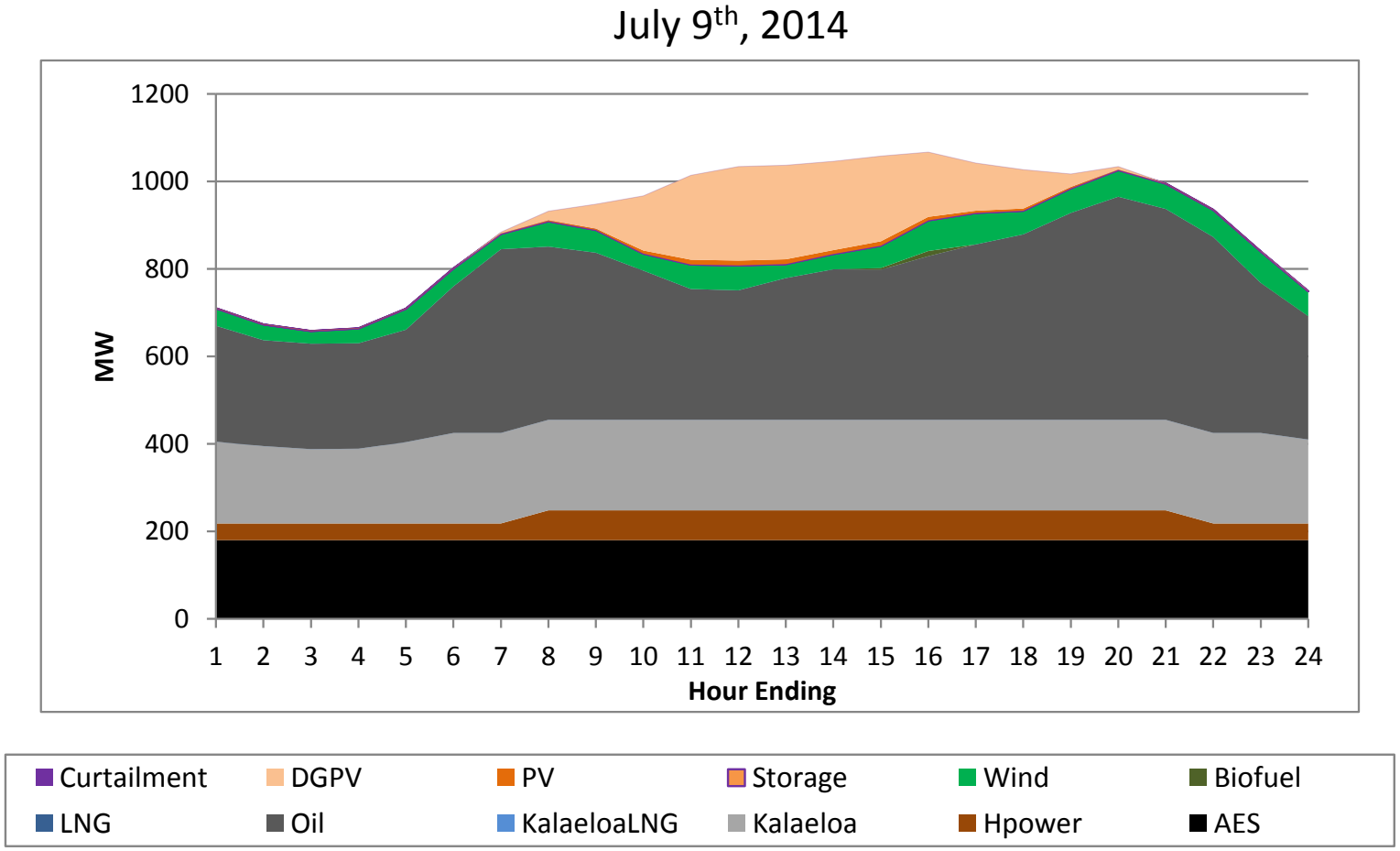
# Hawaii Today

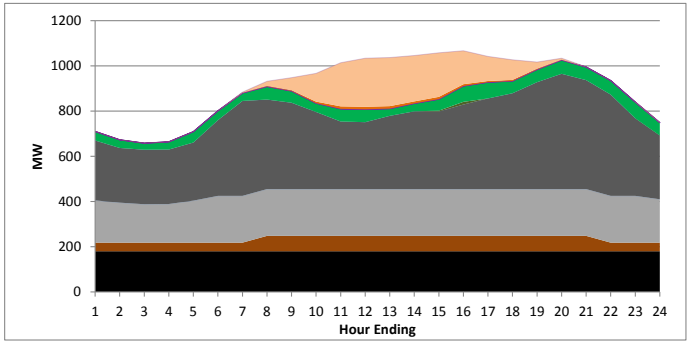
- Balancing historic fossil generation with large growth in PV



# Hawaii Today

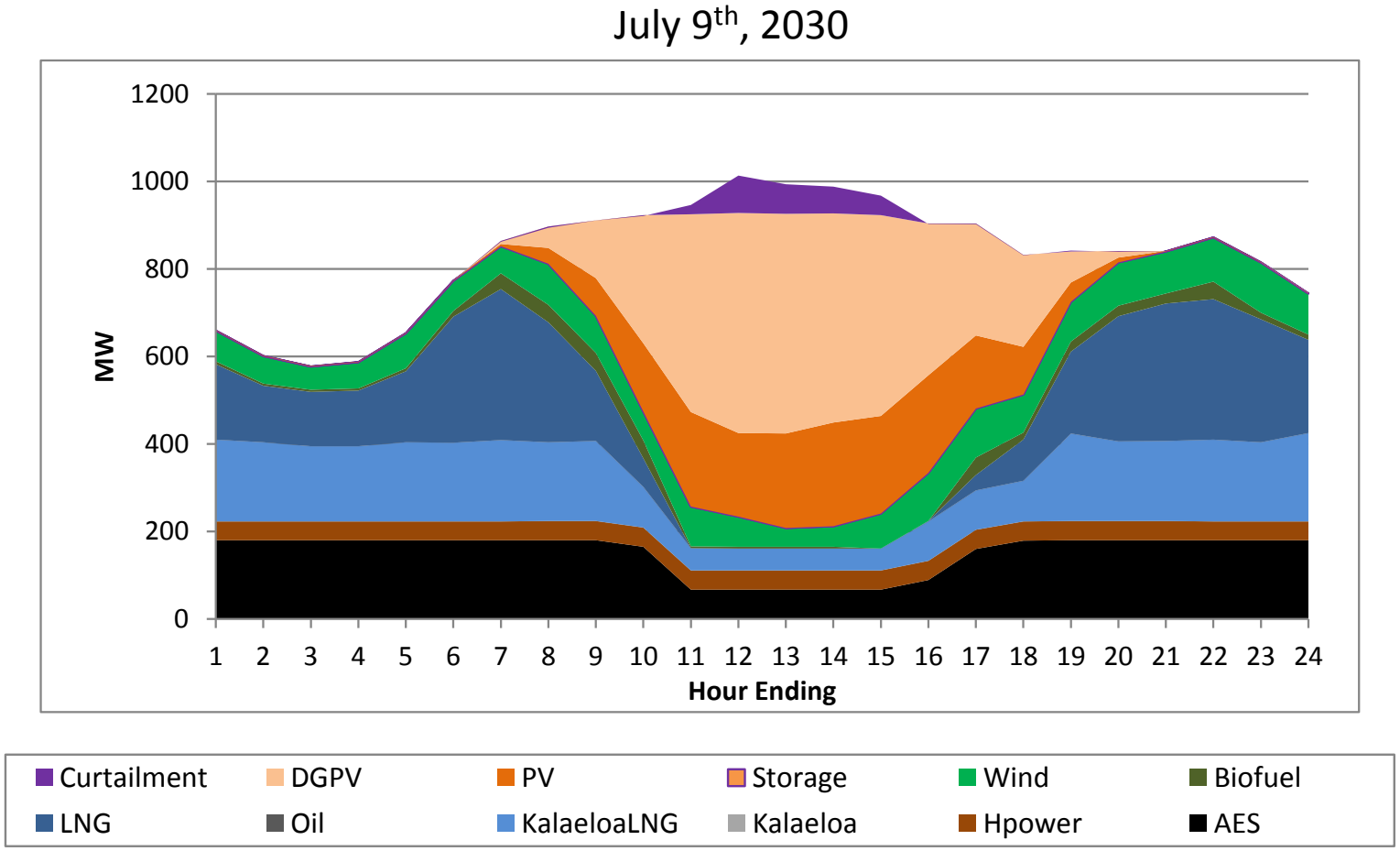
- System characterized by large, inflexible fossil generation
- Fluctuations resulting from demand-side PV relatively easy to manage using existing technology
- Prices can vary rapidly as fuel prices fluctuate on the global market

July 9th, 2014



# HECO's plan for 2030

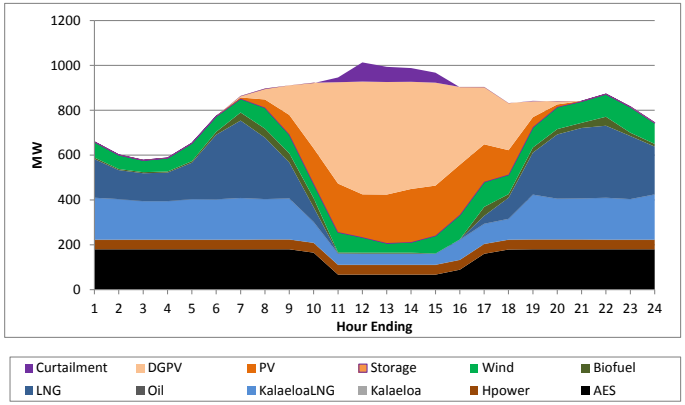
- LNG along with expansion of customer and utility owned RE



# HECO's plan for 2030

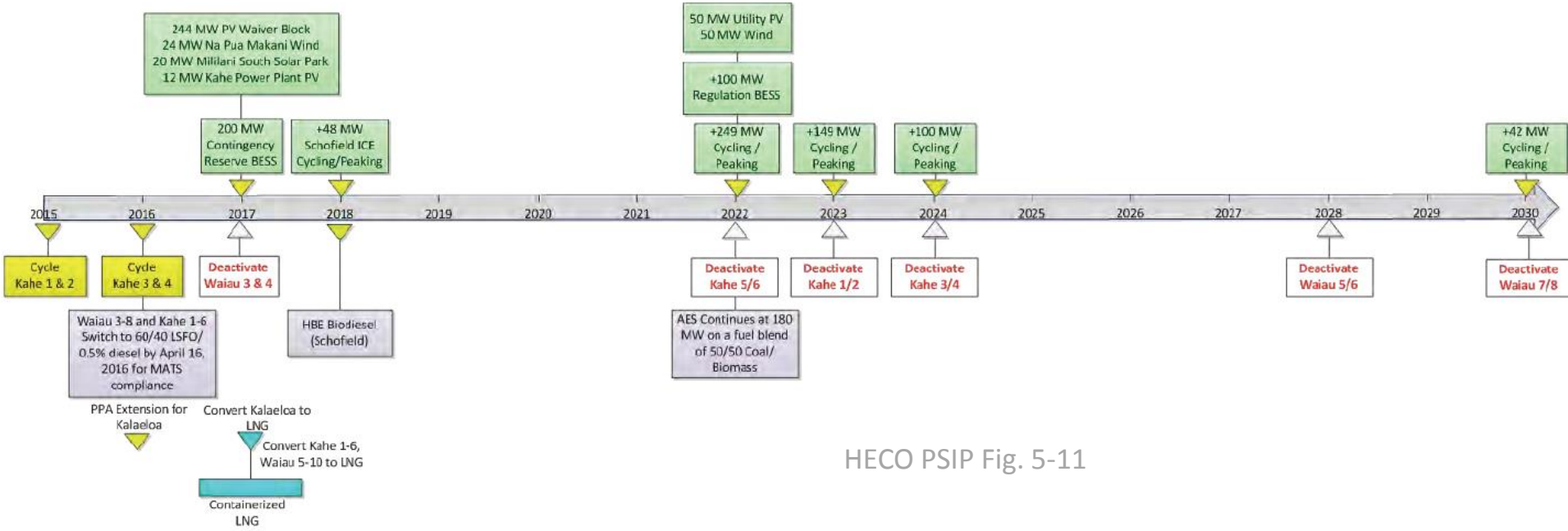
- Daily cycling of fossil gen, coupled with rapid ramp up/down periods
- Occasional curtailment of PV may be economic compared to large investments to capture all energy
- Still vulnerable to price swings of fossil fuels on the global market

July 9th, 2030



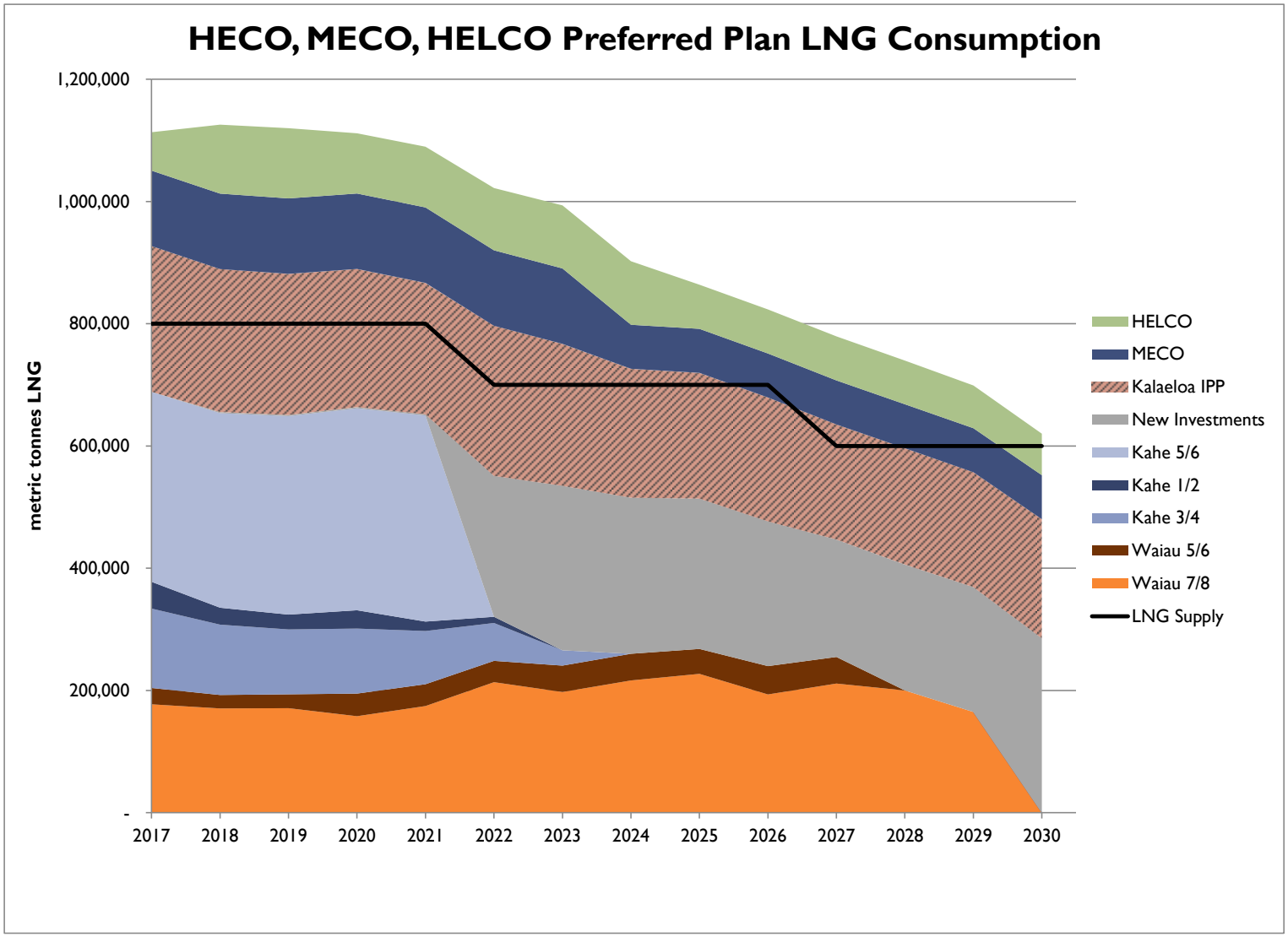
# How to get there?

- Convert old steam plants to LNG, then retire and replace gradually
  - Kahe (600MW) 2022-2024
  - Waiau 3/4 (93MW) in 2017, Waiau 5/6 (108MW) in 2028
- 600MW of new efficient and fast ramping CC, CT, and ICE units



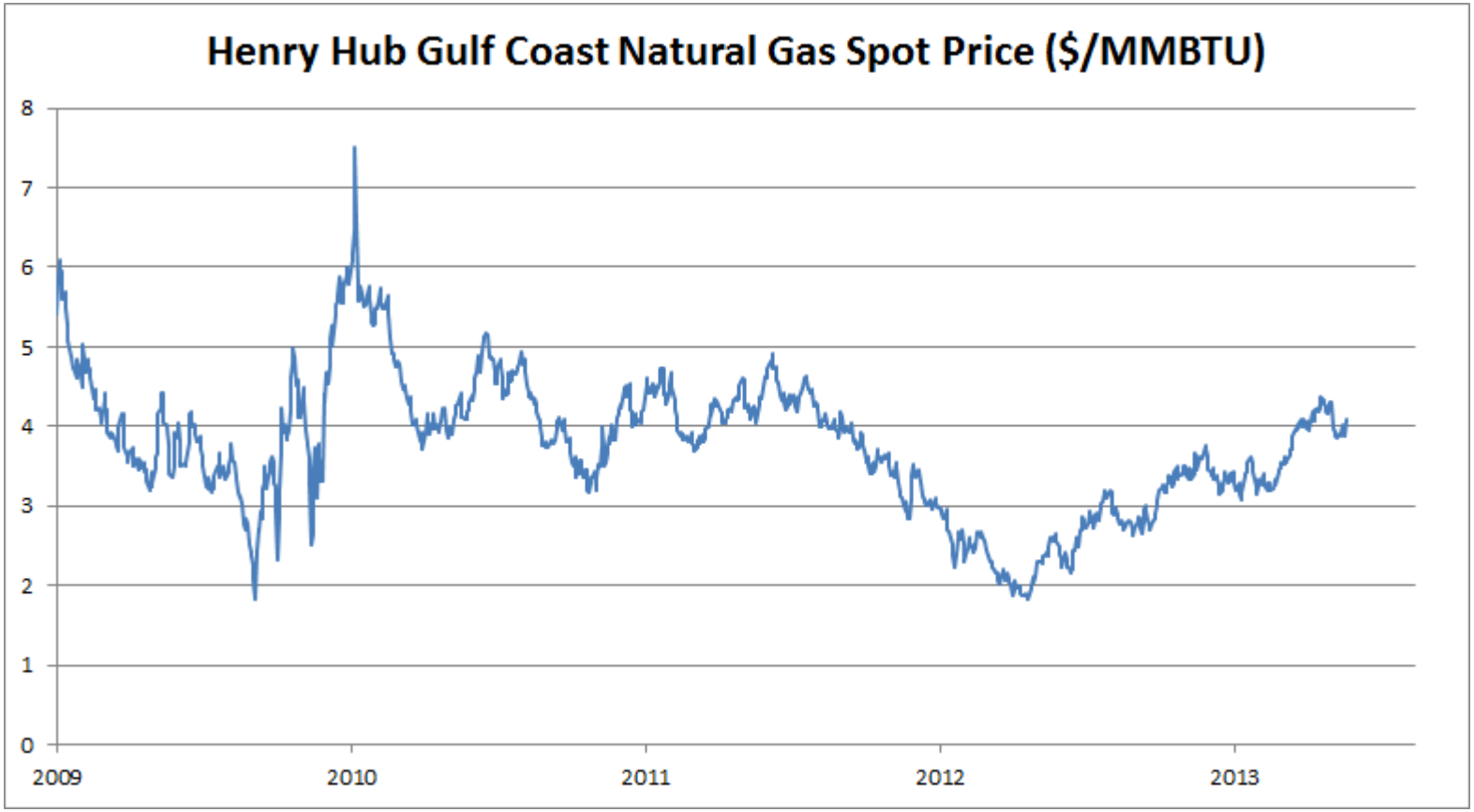

HECO PSIP Fig. 5-11

# LNG Fuel use



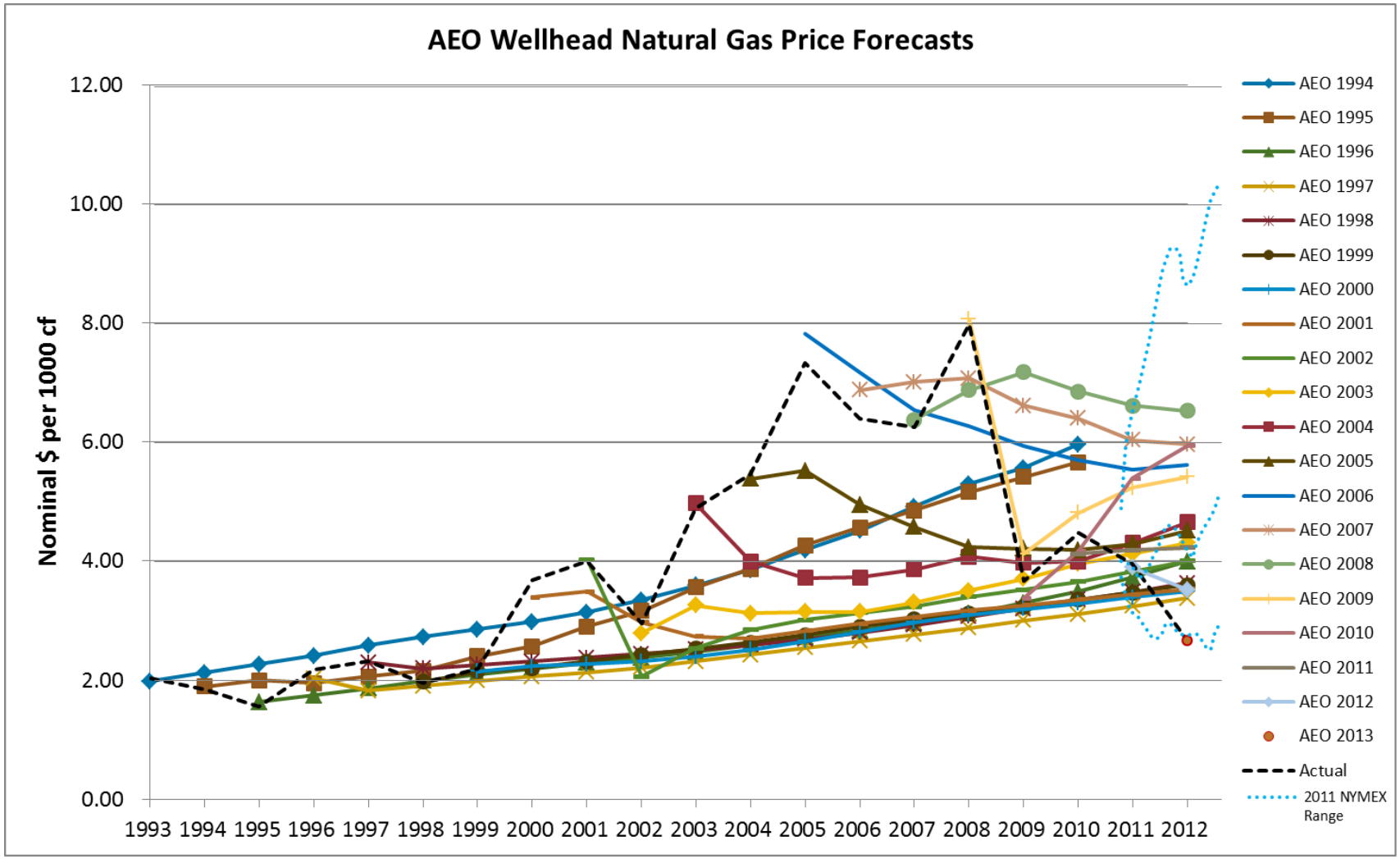
# Risks

- Never ZERO risk – goal is to manage
  - Example: Fixed price long term contracts vs market risk



# Risks

- How reliable are forecasts?



# Risks

**Estimating capital costs for large projects**

Edward Merrow

"Understanding the Outcomes of Megaprojects" (1988)

- **Scope**: Poor project definition is the source for most faulty cost estimates, particularly challenging in *"first of a kind" projects*
- For long projects, **economic assumptions** are crucial; a small error in the assumed inflation rate can result in large changes in expenditures
- **Project execution**: can lead to higher costs than necessary, but rarely the primary source of cost growth
- **Regulatory Uncertainty:** Expansions or changes to project scope resulting from additional regulations

# DG 2.0

**Revised rates have higher fixed charges, lower per-kWh charges**

| Residential Customer Groups | Monthly Fixed Charge – All Residential Customers | Monthly Fixed Charge – DG Only | Feed-in-Tariff Purchase Price | Tariff for Energy Consumed from Grid |
|---|---|---|---|---|
| Current NEM Customers | $55 | n/a | n/a | n/a, within NEM energy balance, retail rate for any shortfall |
| DG 2.0 Customers | $55 | $16 | $0.16 | Retail rate |
| Full Service Customers | $55 | n/a | n/a | Retail rate |

Table 6-1. Estimated O'ahu DG 2.0 Customer Charges and Feed in Tariff Rate

**Why this shift in rate structure, from high variable rates to less-high variable rates and more fixed charges?**

- Finding an appropriate level of subsidization to account for benefits of PV
- Business certainty in monthly and annual revenue for the company

# DG 2.0 – system implications

- Impact of DG 2.0 rate design on customer responsiveness to **dynamic pricing**
  - Variable rate becomes a smaller portion of bill and sends less of a signal
- HECO projects decline in dynamic pricing load response after 2020
- How does integrate with a push for more electric vehicles?
- Decoupling
- Cross subsidization – low usage customers subsidizing high usage customers
- Other net metering policy options include:
  - Limits to or expiration of net metering credits
  - Alternative rates for excess generation only
  - Location-based compensation for net metering generation
  - Limits to size of DG installs

# Alternative Plan

- Has HECO considered all alternatives? What about:
  - Find ways to retire some old units sooner (and avoid investments in them)
  - Existing Waiau CTs and CIP are not used much in Preferred Plan - could they be maintained to reduce need for new CTs and save costs?
  - Energy efficiency and demand response