

But is it a good deal?

Complications in evaluating displacing diesel with privately-funded geothermal power in Nome, Alaska, USA

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ACEP
Alaska Center for Energy and Power

Outline: A Geothermal Power Purchase Agreement for Nome?

- 1) Geographic background
- 2) Commercial background
- 3) Diesel price levels and volatility projections

Map Area



ALASKA



Nome facts:

- Population about 3,500
- No road access
- Diesel-based islanded microgrid
- Avg. annual load ~4 MWe
- Municipally-owned utility

TRAIT

SEWARD PENINSULA

PILGRIM HOT SPRINGS

Nome ●

0 30 60 mi

0 50 100 km



Pilgrim Hot Springs

- ◆ 90°C 20m below surface; est. reservoir temp is ~150°C
- ◆ 30-40 MWth; 2MWe?
- ◆ Private developer interest; ~\$40 million investment

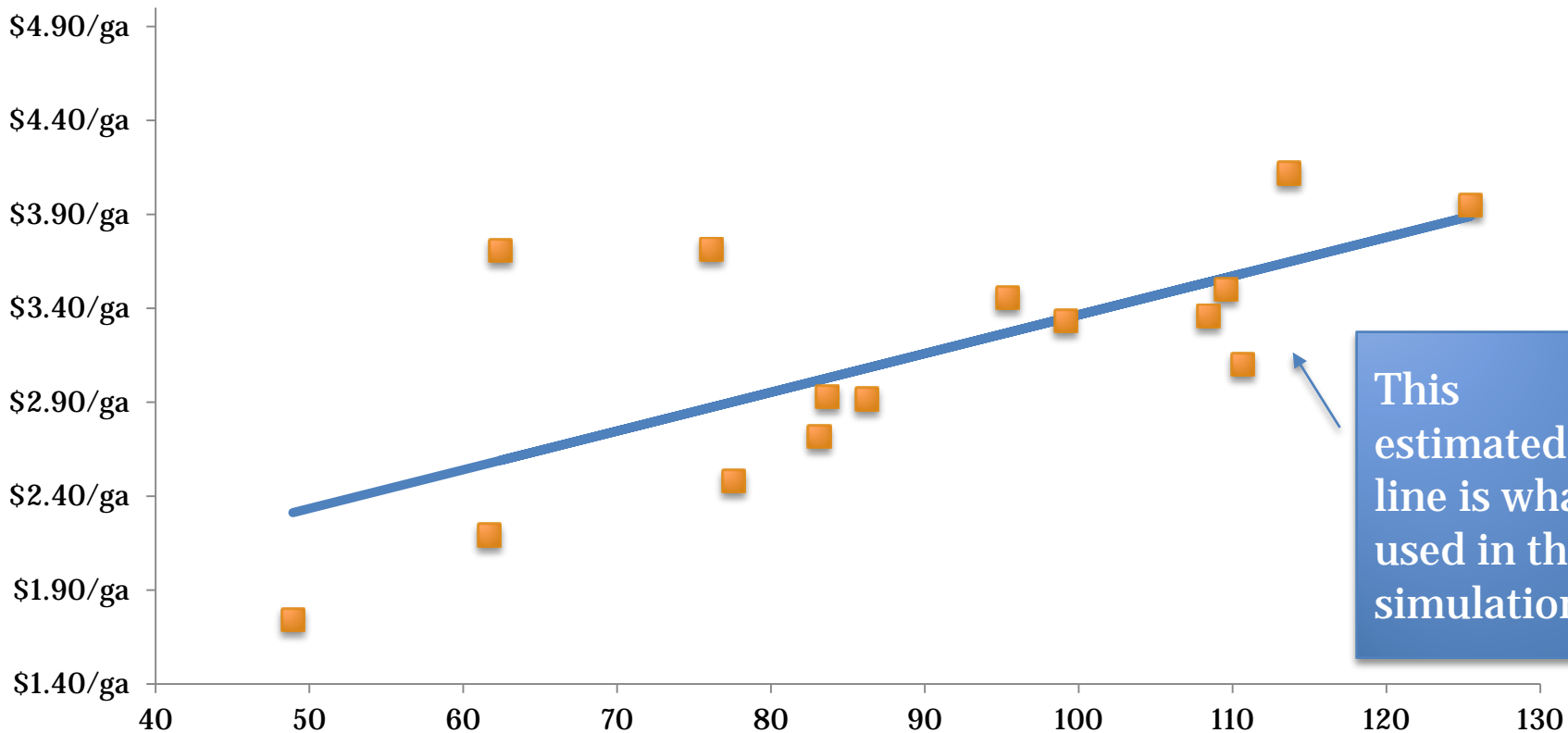


Commercial background: PPA terms

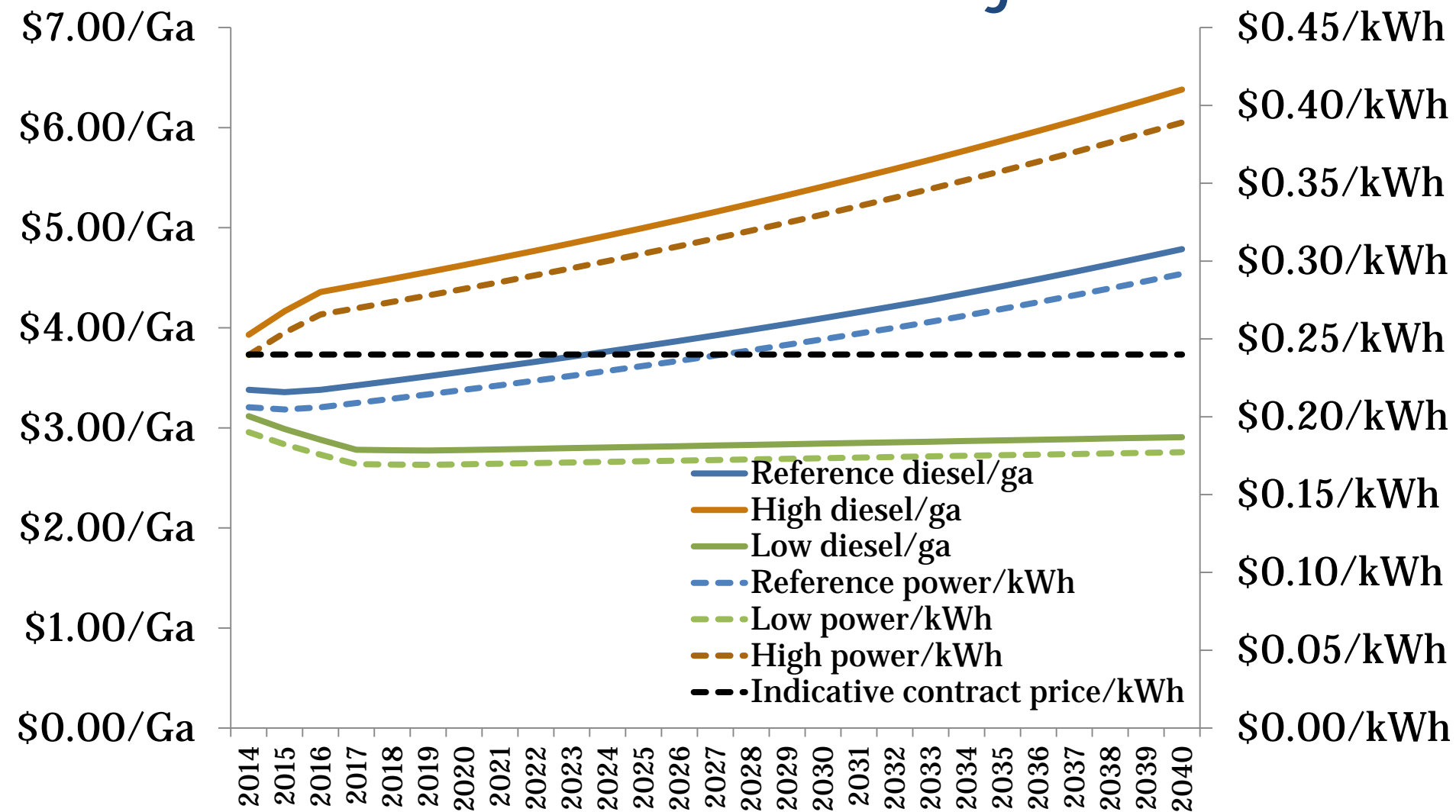
- Price offer:
 - **\$.26/kWh, flat nominal *or***
 - **\$.24/kWh, escalating 2%**
- Take or pay, up to 2MWe
- Marginal benefit = displaced diesel
- Last year's diesel = \$3.50/gallon → \$.22/kWh
- Power purchase agreement between Potelco and municipally-owned public utility must be approved:
 - **By utility board**
 - **Nome city council**
- Diesel prices in future?

Estimated Link Between Crude Oil and Diesel Prices (NJUS)

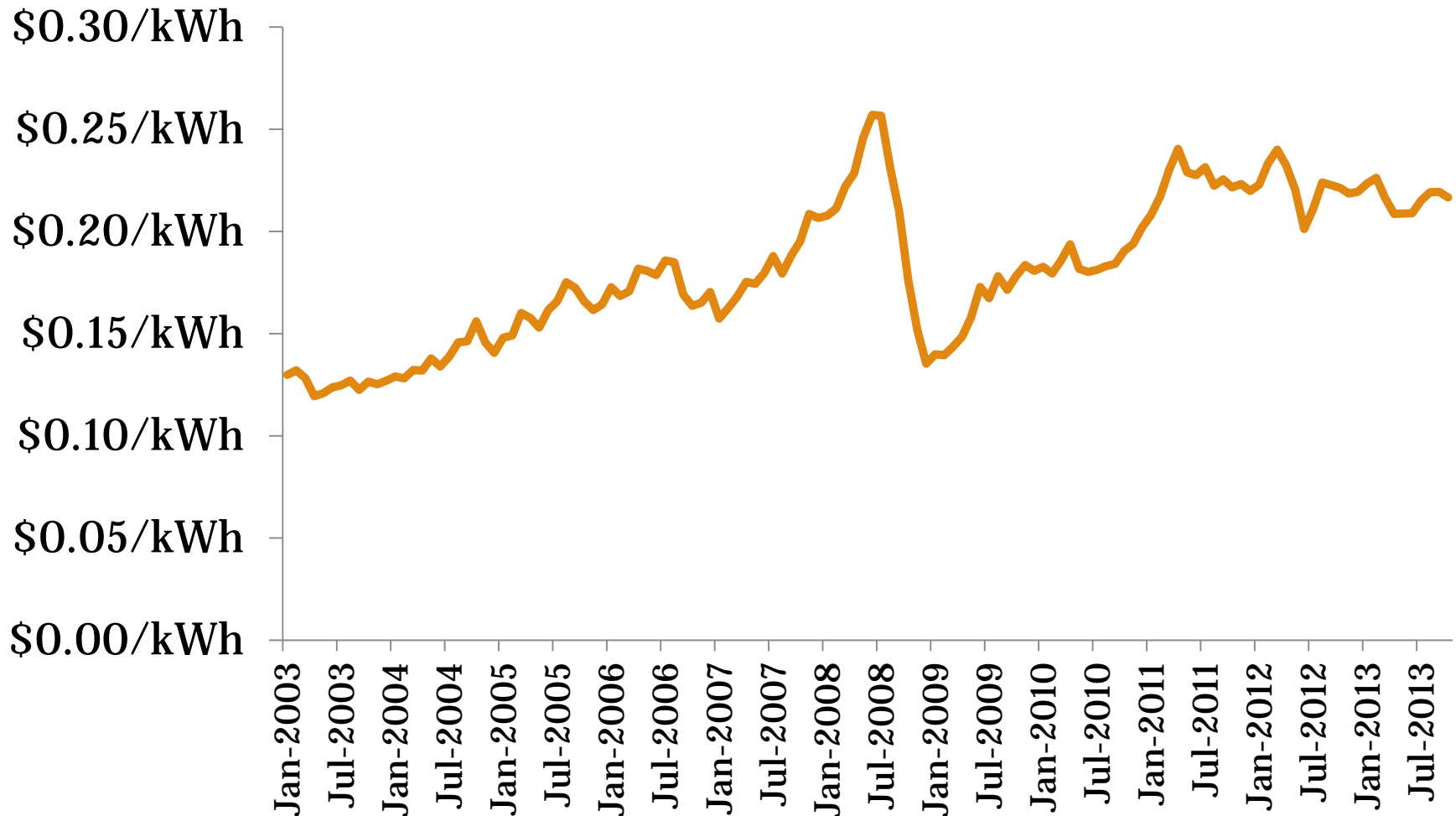
Nome Diesel against ANS WC Crude Oil Prices (\$/Bbl)



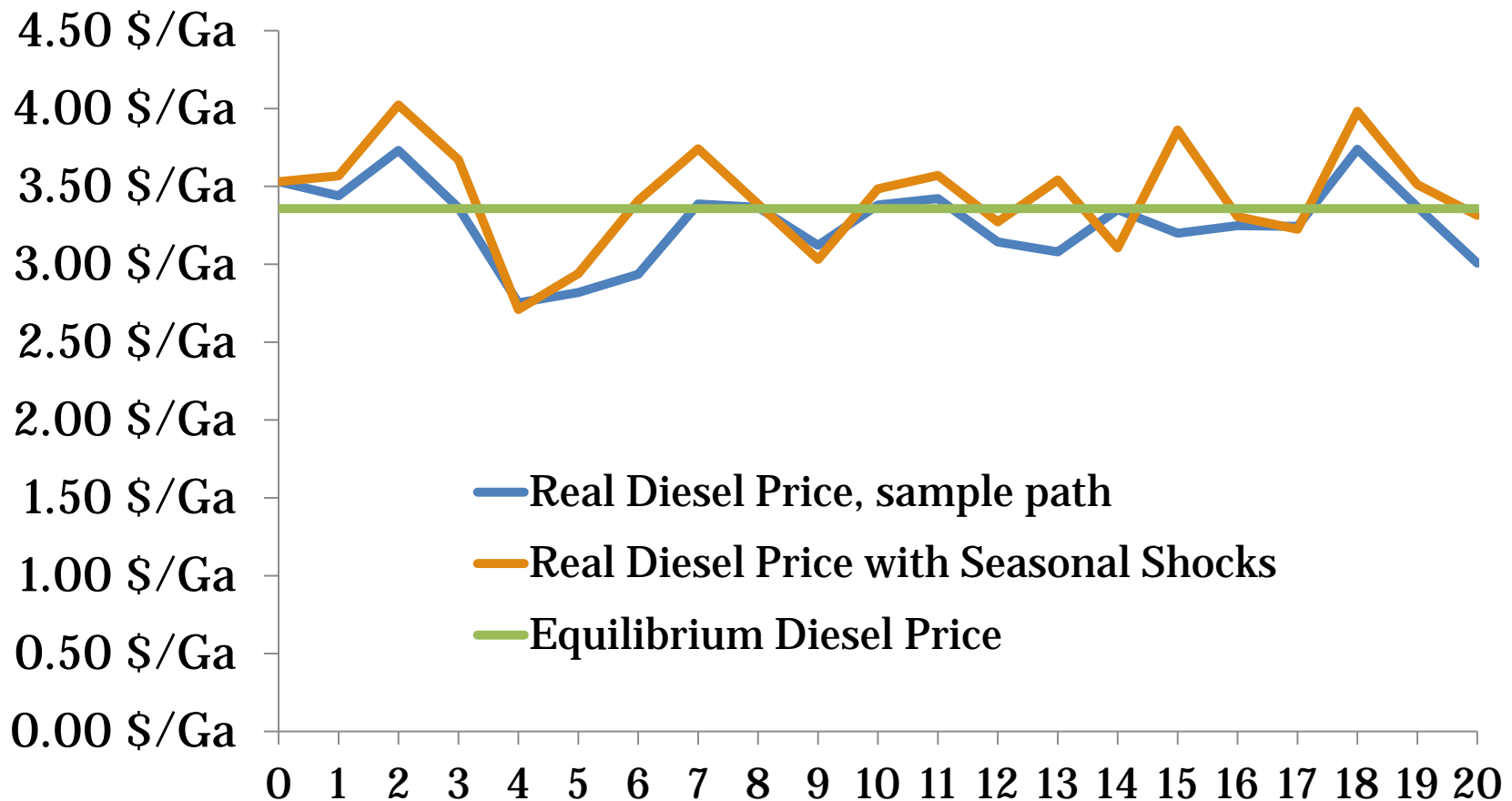
Diesel Portion of Electricity Costs Given US DOE Crude Oil Projections



Simulated historical Nome electricity prices volatility from diesel fuel



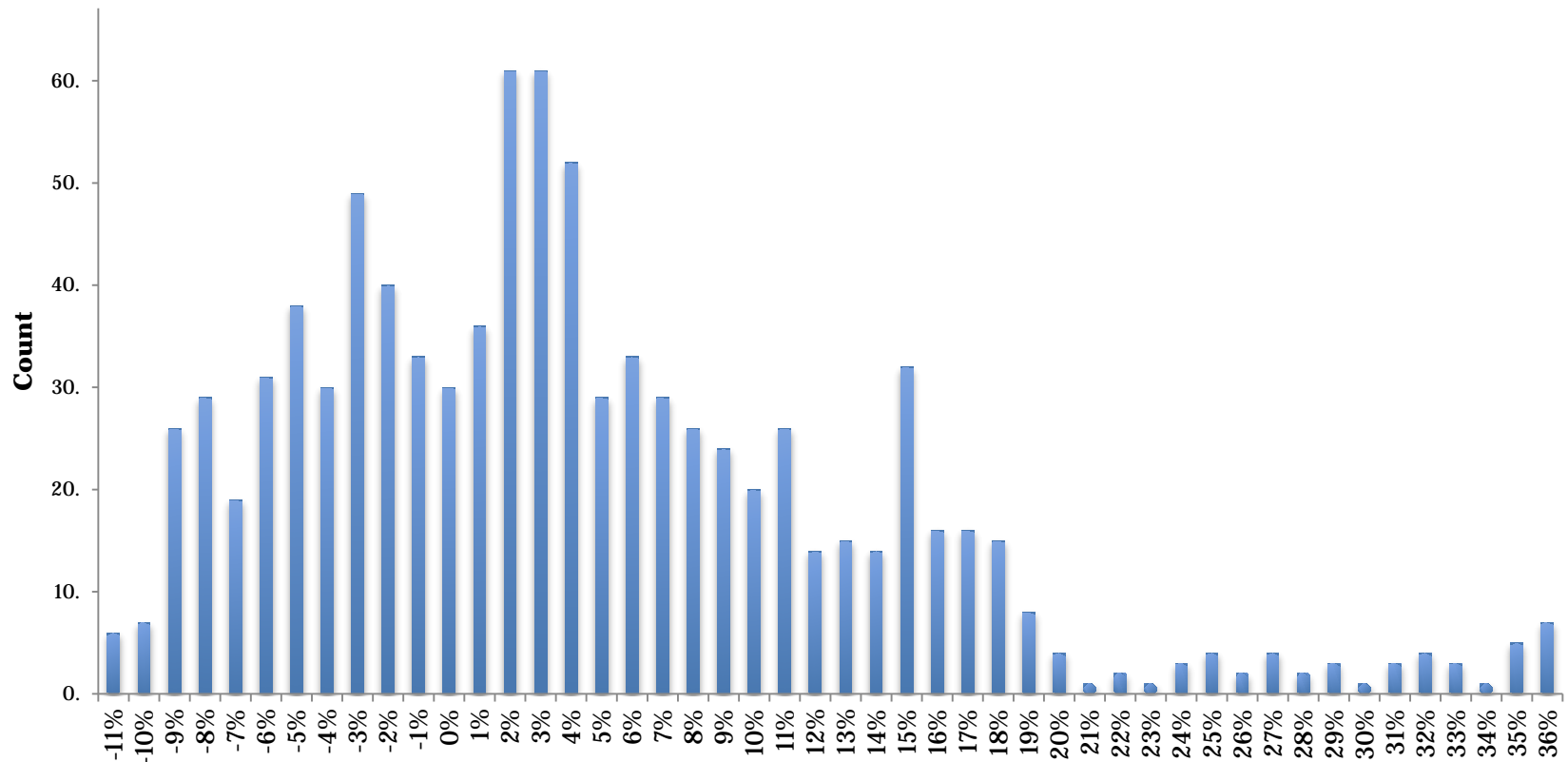
Simulated price paths, including lift date (seasonality) uncertainty



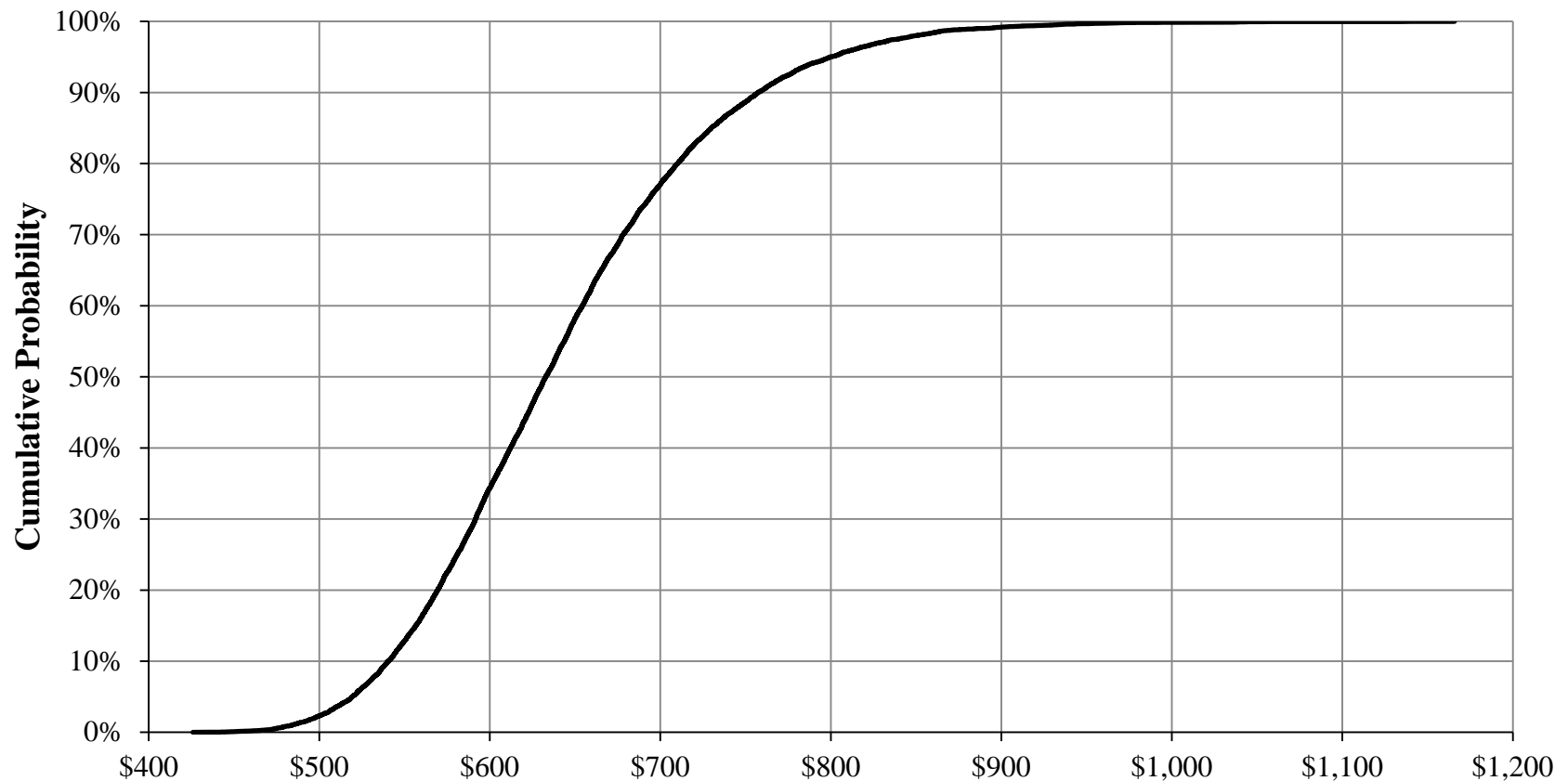
But NOME faces even more volatility



Percent price differences, 3-day avg ANS WC from yearly means, 2003-2013



Household Diesel Expenditure on Electricity, Cumulative Distribution



How does it end?

- Nome signed the power purchase contract after 10 months of negotiations and deliberations
- Potelco is mobilizing for drilling as we speak
- Final development investment decision this fall or winter



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Questions?

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