ANALYSIS OF FULL REQUIREMENTS PRODUCTS IN THE 2014 PROCUREMENT PLAN

IPA Workshop
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Full Requirements Supply

A full requirements supplier provides a fixed proportion of all the energy needed by an identifiable set of a retailer's customers

- The proportion is constant over time, for instance, a single supplier will prove 5% of the retailer's demand at all time

A full requirements supplier can supply just energy, at the load center or at some wholesale hub (load following energy supply)

Cost of full requirements energy supply

The supplier's guarantee is a form of insurance

- The cost of full requirements supply should be more than the expected cost of power
- The difference is the insurance premium

Two key questions

- How big is the uncertainty (variation in possible outcomes)?
- What will it cost to insure against that risk *and is it worth it?*

We attempted to estimate the uncertainty, and the size of the insurance premium, to understand how a full requirements product would be priced relative to IPA's other supply alternatives

Integrating full requirements into an existing portfolio

One issue to be considered, if the IPA were to begin buying full requirements products for the next few years, is that they would have to be integrated into a portfolio containing other hedges

Options

- Sign full requirements contracts for a prorata share of the load, using existing hedges only for the remaining load (which may be overhedged).
- Sign full requirements contracts for a prorata share of the residual load, net of existing hedges
- Sign full requirements contracts for a prorata share of the load, and allocate a prorate share of existing hedges to each full requirements supplier (may not be assignable)

The analysis in the 2014 Procurement Plan was based on full requirements contracts for the entire load, with the existing hedges layered on top (adding in some uncertainty)

We estimated the cost and premium of *load following energy*

We did not include the cost of insuring against the risks associated with

- Capacity
- Ancillary services
- Network transmission
- Losses and congestion

Estimating the uncertainty in supply costs

We simulated the supplier's cost to supply energy for each utility using a Monte Carlo model

Assumed suppliers would try to hedge part of their price exposure with forward contracts ("block and spot") as opposed to vertical integration (or 100% spot)

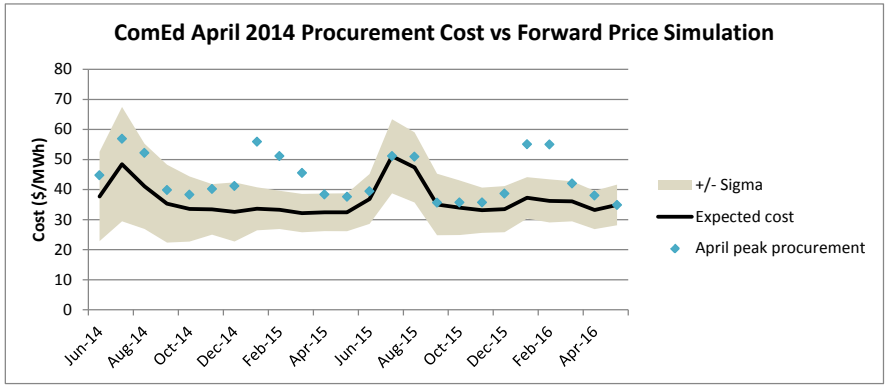
Tested a number of alternative hedging plans that the supplier could use and assumed the supplier would use the plan with lowest expected cost

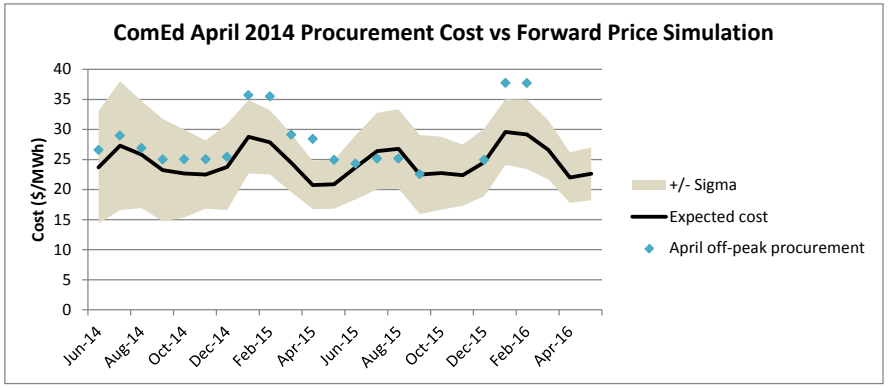
Simulated uncertainty (risk) in:

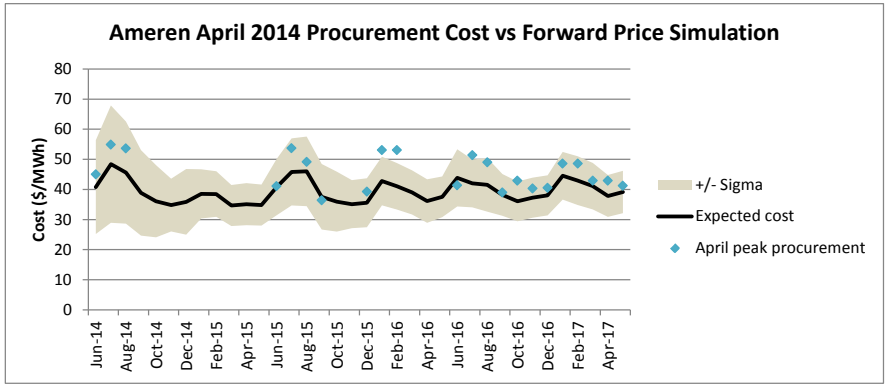
- Utility load, based on utility-defined base, low and high cases and probabilities assessed from conversations with utility forecasters. Load migration is the key uncertainty in a newly opened market such as Illinois
- Evolution of forward and spot prices based on historic trends – three year price trends were represented by the last seven three-year periods
- Assumed that price trends were correlated with load changes over the projection horizon but correlated with load (correlation coefficients ranging from 20% for prices one year forward to 50% for three-year forward prices)

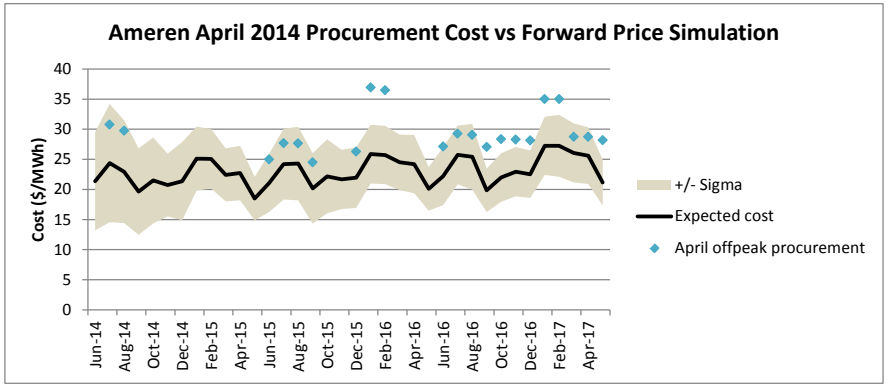
Forward prices simulated last year were close to observed prices in the April IPA procurement

Observed prices were within one standard deviation of the expected value except in midwinter, reflecting a runup in forwards in 2014









What is the value of certainty?

Expected utility theory: the value of certainty is the avoided cost of uncertainty.

- Approximation: it is proportional to the variance of the uncertain cost

One way to estimate the cost of uncertainty is the cost of insuring against it

- Cost of maintaining capital to cover a loss
- E.g. if the insurance amount is the loss that will be exceeded at most 5% of the time (95th percentile), the capital to be maintained is the 95th percentile loss
- Cost of uncertainty is the cost of maintaining that capital ➔ the return that must be paid to a lender or equity investor

The Procurement Plan estimated the insurance cost based on a 10% annual cost of capital

- The 10% figure was chosen by reference to the legal standard for utility return, which was about 9%

Estimated full requirements contract costs (and premia) if purchased in April 2014

These estimates were made in August 2013 based on then-current forward curves

UTILITY	DELIVERY YEAR	EXPECTED COST	INSURANCE PREMIUM	ESTIMATED COST OF FULL REQUIREMENTS
Ameren	2014-5	$32.68/MWh	$0.94/MWh	$33.64/MWh
Ameren	2016-7	$36.22/MWh	$3.24/MWh	$39.46/MWh
ComEd	2014-5	$32.58/MWh	$0.99/MWh	$33.57/MWh
ComEd	2016-7	$35.62/MWh	$2.13/MWh	$37.75/MWh

Note that they do not include the cost of integrating the contracts into the existing, already-hedged portfolio

Key question left unanswered

The cost of insurance is not what it is worth

Ratepayers will only buy it if its value exceeds its cost