Approach to Wholesale Energy Purchase Costs

ACIL Tasman

QCA Workshop,

25 November, 2011
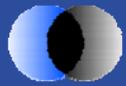
What ACIL Tasman was asked to consider

- ACIL Tasman's proposed methodology is intended to estimate as accurately as possible the EPC faced by a representative retailer to supply loads in the Energex area

- The approach and methodology must take into account the Ministerial Delegation received by the Authority to determine regulated retail electricity tariffs for Queensland for 2012/13
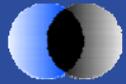
The Terms of the Ministerial Delegation relevant to the EPC calculation

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- The Authority is to ensure that the revised retail electricity tariffs are (inter alia):
  - cost-reflective
  - consistent with the Government's policy objective that consumers, wherever possible, have the opportunity to benefit from competition and efficiency in the marketplace
  - available to customers in the Energex supply area using less than 100MWh per year
  - available for all customers in the Ergon Energy supply area under the Queensland government's Uniform Tariff Policy

- The Delegation also specified that the calculation of the EPC for each tariff must consider:
  - the cost of energy
  - market fees and ancillary services costs
  - energy losses as published by the Australian Energy Market Operator (AEMO)
  - the impact of carbon pricing
  - costs associated with complying with Commonwealth and State environmental and energy efficiency schemes
  - anؚ other costs imؚosed on retailers bؚ anؚ new comؚulsorؚ scheme

The four approaches considered

1. Long-run marginal cost of supply (LRMC)

2. Pool price projection overlayed by contract prices and a contracting strategy

3. Mean of the distribution of annual price projections under a wide variety of possible weather and plant outage outcomes

4. Combinations of the above methods
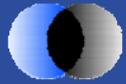
Approach 1 - LRMC

- LRMC is an estimate of the full cost of supplying an additional unit of energy in the Queensland market

  - It is applied in other Australian jurisdictions and relies on published data

- In the form that has been applied in recent calculations the LRMC estimate may bear no resemblance to a retailer's EPC

- The calculation ignores existing primary energy (coal and gas) costs as well as the generation costs of existing plant

LRMC (continued)

- Importantly, it ignores the current state of the Australian and Queensland electricity market
  - whether it is over or under supplied?
  - how much new plant is being built?
  - are gas and coal costs for existing power stations increasing or decreasing?
  - any major events (drought, international markets) that are or expected to influence prices?

- An LRMC approach does not provide an opportunity for "…consumers … to benefit from competition and efficiency in the marketplace"

Approach 2 - A market based approach – used as part of the BRCI calculation in the past

- involves estimating the wholesale EPC that a representative retailer would incur in supplying the energy under each retail tariff in the Energex network area. It would include the steps:

1. Develop a load trace for the year to be projected using the load trace of the most recent year and transforming it to match the AEMO annual energy and 10%, 50% and 90% (POE) peak demand forecasts. These three half-hourly load traces would be used in three different projections of annual half-hourly prices.

2. Carry out a projection of half-hourly prices using a market simulation model for each of the three load traces.
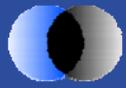
A market based approach (continued)

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3. Estimate forward contract prices for swaps and caps using forward contract price data such as d-cypha trade

4. Determine an appropriate hedging strategy for a prudent representative retailer and calculate contract volumes using a contracting model with an appropriate mix of contract periods , two-way and one-way hedges and flat and peak contracts.

5. Bring together the contract prices and volumes with the projected half-hourly pool prices for the three load traces and calculate a cost of energy for the year.
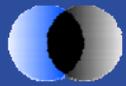
Difficulties with the market based approach

- It relies on a proprietary market simulation model, a "black box", which contains a number of important assumptions along with a replica of the AEMO market settlement algorithm to produce half-hourly regional reference prices (RRPs).

- However, nearly all approaches to forecasting wholesale prices 1 to 2 years out will involve such a model
  - Assumptions can be presented transparently and differences between proprietary models identified and managed
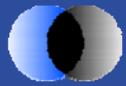
Other difficulties with the market based approach

- Reliable contract information.
  - This approach does not take into account bilateral contracts for difference (CFDs) between generators and retailers. These contracts can form a high proportion of the retailers' contracts and may contain different prices/volume terms to OTC contracts presented in public sources

- Developing a representative contracting model

- The difficulties for 2012-13 in getting forward contract prices for mid 2012 onwards (after the commencement of the carbon emissions tax)
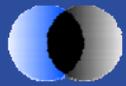
Approach 3 - Developing an annual price distribution

- Given the difficulties of Approaches 1 and 2 ACIL Tasman proposes a market based approach which involves establishing a distribution of possible load weighted annual prices for 2012/13 for each tariff, the net system load profile and the overall Energex load incorporating weather and plant outage variations.

- Retailers take out forward contracts so that they are insured against the potentially high prices that can sometimes occur in the NEM. The distribution of possible price outcomes is not a symmetrical and well-behaved bell curve where the probability of high prices is the same as that for low prices. The price at the fiftieth percentile (the median price) may be $40/MWh, for example, while the lowest half-hourly price experienced is $15/MWh but the highest is $12,500/MWh.

- Retailer contract strategies are intended to fix their forward cost commitments and insure against such high price events.

Developing an annual price distribution (continued)

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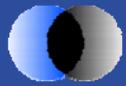
- To insure against extreme price events due to weather and plant outages a prudent retailer would use hedging and other contractual instruments. The mean of the price distribution which covers the full range of possible weather and outage outcomes provides a robust estimate of the of the cost to provide such insurance. To pay a higher price for this insurance than the mean price would suggest a an overly risk averse approach.

- The median of the distribution represents the annual load weighted price which would occur under normal weather and outage conditions and would be expected to be exceeded one year in two. On the other hand, the mean of the price distribution provides an estimate of the price which a prudent retailer would be prepared to pay for energy to account for weather and outage risk.

Developing an annual price distribution (continued)

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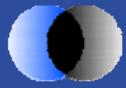
Each tariff has a different load profile and would have a different distribution of the annual load weighted price and a different mean. Again the mean of the annual load weighted price distribution for each tariff represents the price a prudent retailer would be prepared to pay for energy to supply the load associated with that tariff.
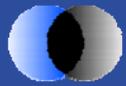
Approach 4 - combination of LRMC and market based price estimation

- This methodology has been considered as one of the options as it was used for the calculating the BRCI.

- We have discussed above why we do not consider the LRMC approach an appropriate one for this exercise and why the market based calculation has some difficulties associated with it, particularly this year when contract prices appear so uncertain.
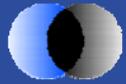
Estimating other energy purchase costs – LRET

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- ## LRET
  - The RPP is applied to the LGC price to establish the cost per MWh supplied to customers.
  - For the BRCI the average market price of LGC recorded by AFMA over the previous two years was used. We believe this is also appropriate for 2012/13 tariffs

SRES

- SRES –
    - found by applying the Small-scale Technology Percentage (STP) to the STC price per MWh to apply to each tariff.
    - the final Small-scale Technology Percentage (STP) will not be known for the second half of the 2012/13 until after the tariff year commences. The ORER publishes an estimate for the calendar year applying in the latter half of the financial year which we suggest using for the 2012/13 year.
    - The current official price for STCs is $40/STC and STCs are available to retailers from the ORER clearing house for this price. An active market for STCs has developed outside the clearing house and the current market price for STCs is well below the official $40 price.
    - This raises the question whether we should take both clearing house price and market price into consideration . However, using use the market price would pose a number of difficulties including the need to forecast the proportion of STC likely to be traded in the tariff year.
    - Given that the STC market is for spot sales and not a forward market and given that volumes traded are not available ACIL Tasman proposes using the clearing house price as the price for STCs.

GEC

- For the 2011/12 BRCI the cost of GECSs was based on a two year average of the AFMA prices for GECs.

- Retailers have stated that this does not reflect their costs in acquiring GECs, some entered long term contracts early in the scheme when prices were higher

- ACIL Tasman's view is that where a market price for inputs to the calculation of retailers' EPC can be sourced reliably and consistently each year it should provide the best guide to the cost of compliance with the scheme.

- However, given that GECs have been acquired by various means we propose that the AFMA weekly GEC prices be averaged over an extended period of 208 weeks or 4 years as follows

  - for 2012 - from 1 Dec 2007 to 31 Dec 2011
  - for 2013 - from 1 Mar 2008 to 31 Mar 2012
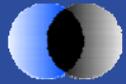
Retailer costs and market fees

- **NEM retailer costs**
  - we propose to use the same methodology as used for the BRCI

- **Market fees**
  - the estimated NEM participant and FRC fees will be taken from AEMO's draft budget NEM fees for 2012-13.

- **Ancillary services**
  - estimated by aggregating settlements data for ancillary service payments for Queensland provided by AEMO for the latest 52 week period and dividing by the MWh used in that period

Transferring the EPC estimation and other energy purchase costs into an estimation of a retail tariff

- The approach has been guided by the requirement that tariff prices should be cost-reflective.

- In view of this there is to be no fixed charge in the energy purchase component so all the EPC will be recovered by applying a charge or charges linked to energy consumption

- The approach to individual tariffs is as follows:

- for all tariffs not using an interval meter (e.g. inclining block domestic, controlled, unmetered, flat commercial and industrial) the EPC will be recovered by a charge or charges on consumption only

- for the domestic time-of-use (TOU) tariffs there will be different allowances in the price for EPC for peak, off-peak and shoulder times and where necessary for week days and weekends. These rices will be determined b combinin the standard 50% POE tariff load trace with the expected pool prices from the pool price modelling and adding percentage so that these prices equate to the mean of the load weighted price distribution from the stochastic analysis plus the allowance for the time value of contracts.

- for other interval metered tariff customers the peak and off-peak prices will be established using the same methodology as TOU tariffs.