Retail Electricity: Scale Economies, Competition, Regulation Policy

Figure 1.1 Theoretical Framework

Lyn Grigg
PhD Findings

Retail Electricity in the
Australian National Energy Market (NEM)
10yrs of Reforms and Restructure
Australian National Energy Market (NEM) States

Services 18 million of a 20 million population

Major Inter-connectors
# Pre & Reform Industry Structure

<table>
<thead>
<tr>
<th>PRE REFROM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regulation:</strong> States</td>
</tr>
<tr>
<td><strong>Ownership:</strong> Public</td>
</tr>
<tr>
<td><strong>Market:</strong> Monopoly/Franchises</td>
</tr>
<tr>
<td><strong>Sectors:</strong> Generation, Transmission, Distribution</td>
</tr>
<tr>
<td><strong>Structure:</strong> Fully vertically integrated, Generation &amp; Distribution</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REFORM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regulation:</strong> Federal &amp; State</td>
</tr>
<tr>
<td><strong>Ownership:</strong> Public &amp; Private</td>
</tr>
<tr>
<td><strong>Market:</strong> NEM</td>
</tr>
<tr>
<td><strong>Sectors:</strong> Competitive &amp; Monopoly/Franchises</td>
</tr>
<tr>
<td><strong>Structure:</strong> Separate, Distribution &amp; Retail</td>
</tr>
</tbody>
</table>
## Competitive Market Model

<table>
<thead>
<tr>
<th>Model</th>
<th>All Jurisdictions</th>
<th>Except</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Retail Contestability</td>
<td>phased in to 2003</td>
<td>Tasmania 2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Queensland &lt; 100Mwh</td>
</tr>
<tr>
<td>Market Contracts</td>
<td>Yes - Transition &lt;160Mwh franchise/regulated To 2007 ACT &lt;100Mwh to 2006</td>
<td>Queensland No &lt; 100Mwh Tasmania 2010</td>
</tr>
<tr>
<td>No Retail Price Controls</td>
<td>&gt;100Mwh</td>
<td>Regulated Tariff &lt;100Mwh to 2007</td>
</tr>
<tr>
<td>Privatization Retail</td>
<td>Victoria South Australia (100yr lease) ACT (joint)</td>
<td>NSW, Queensland Tasmania</td>
</tr>
<tr>
<td>3rd Party Access</td>
<td>Yes varies</td>
<td>Tasmania silent</td>
</tr>
<tr>
<td>Auction Wholesale Trading</td>
<td>Yes NEM compulsory</td>
<td>Tasmania fully 2006 NSW and Queensland balancing scheme franchise</td>
</tr>
<tr>
<td>Sectors competitive</td>
<td>Yes Generation, Retail</td>
<td>Networks monopoly franchise</td>
</tr>
<tr>
<td>Vertical separation all sectors</td>
<td>Victoria South Australia</td>
<td>Ring fenced retail/distribution Separate generation</td>
</tr>
</tbody>
</table>
## Retail Electricity Firms – control?

<table>
<thead>
<tr>
<th></th>
<th>Retail Electricity</th>
<th>Retail Electricity Distribution (some small generation)</th>
<th>Retail Electricity Generation</th>
<th>Retail Electricity &amp; Gas Distribution Generation Exploration Other Utilities</th>
<th>Retail Electricity Distribution Other utilities Water, Sewage, Telecom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reform 1995 0n (17)</td>
<td>1 private</td>
<td>11 public 5 private</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study No. Firms (16)</td>
<td>2 private</td>
<td>6 public</td>
<td>3 private</td>
<td>3 private 1 private/public</td>
<td>1 public</td>
</tr>
<tr>
<td>Current (16) Firm Home state</td>
<td>5 private</td>
<td>6 public</td>
<td>1 public</td>
<td>2 private 1 private plus part 1 private/public</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 NSW 3 Victoria</td>
<td>1 Tasmania 3 NSW 2 Queensland</td>
<td></td>
<td>2 Victoria 1 Victoria/South Australia/ACT</td>
<td></td>
</tr>
</tbody>
</table>
Regulatory Structure

FEDERAL - REGULATION

PRE 2005

POST 2005

AEMC – Rules & Development

AER – Economic Regulation & Enforcement - wholesale trading transmission

NECA – Monitor & Enforcement

ACCC – Competition & Trade Practices - Transmission

Function

NEM (1998) – operated by NEMCO

Transmission

STATE – REGULATION prior yr 2005-06

New South Wales - IPART
Queensland – QCA & OE
Victoria -ESC
South Australia -ESCOSA
Australian Capital Territory -ICARC
Tasmania - OTTER (in NEM 2006)

Distribution (2006 Federal)

Retail (2006 Federal) Except Pricing
Australian NEM System

- Wholesale financial trading is outside of the NEM
- Limited - very large industrial end users do negotiate direct with generators/wholesale market
PhD Research Questions

1. How do scale economies affect retail electricity?

2. How does the relationship between inputs and outputs in retail electricity operate?

3. How has competition and regulation policy affected scale economies in retail electricity?
Method

**Strategy:** Industry Case Study

**Scope:** Pre reform to current - 16 NEM Retailers

**Data:** Interviews, Questionnaire, Document Analysis

**Participants:** 15 Retail Electricity Firms
7 State and Federal Regulators
3 Consultant Firms Retail Electricity

**Surveyed:** August to December 2004
Scale in Firms
= L shape, from COGS
Scale in Retail Sector Firms
= L slope - COGS,   S slope – Op Costs

<table>
<thead>
<tr>
<th>Customer numbers per firm</th>
<th>Aus Inland</th>
<th>PD</th>
<th>Ergon</th>
<th>Energex</th>
<th>Origin</th>
<th>AGL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19000</td>
<td>21,775</td>
<td>600,000</td>
<td>1,139,297</td>
<td>2,140,000</td>
<td>2,814,000</td>
</tr>
<tr>
<td>Costs $Aus per customer</td>
<td>1,707</td>
<td>2,749</td>
<td>2,414</td>
<td>1,797</td>
<td>1,327</td>
<td>1,157</td>
</tr>
<tr>
<td>Total cost</td>
<td>2,170</td>
<td>3,099</td>
<td>2,258</td>
<td>1,260</td>
<td>1,132</td>
<td>904</td>
</tr>
<tr>
<td>COGS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total cost less cogs</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Costs with Greatest Impact
Regulation, Competition and Scale Findings

- Regulation was NOT a source of scale economies.
  - Cost greatest impact environment, 3rd party access these costs increase with customers.

- Competition is a source of scale economies
  - Design of competitive market model
    - Customer choice – Systems
    - Auction wholesale trading – Risk mitigation
Perception - Reasons for growth of Firm Size

![Bar chart showing reasons for firm size increase: Scale Economies, To acquire customers, Consolidate market position, Diversify into electricity, Become a market leader, Profit certainty, Avoid bankruptcy, Buy/diversify to electricity, Market Leader, Acquire Customers, Stop takeover, Competitive Market, Regulation, Access jurisdiction, Minimise risk, Consolidation, Entry barriers, Bargain Power, Risk.]

![Pie chart showing reasons for firm size increase: Scale economies (48%), To acquire customers (20%), Consolidate market position (12%), Diversify into electricity (10%), Become a market leader (8%), Profit certainty (3%).]
Sources scale – structure
Horizontal & Scope

• Horizontal 73% reduce costs
• Scope 50% reduce costs & 30% increase cost
• Outcomes are:
  • Bundling
  • Value adding such as Dual fuel
  • Market position increase customer base

• BUT
Does a decrease in average costs actually occur?
  – System compatibility restricts these cost savings
Sources of scale - Structure

Vertical Integration

- Financial support from large asset based sectors
- Reduction in transaction cost

- Distribution
  - Contact centers, 3rd party access and administration
  - but not significant to show scale economies benefits

- Generation
  - Reduces risk of transacting in the wholesale trading market Also, supports Transaction Cost Economies Theory
Sources of Scale - Resources

• Most significant are retail operating costs found in customer services such as:
  • Billing, Contact Center, CRM

– Technology Gaps are identified as creating the biggest unrealized potential
  • System incompatibility creating data migration & integration issues
  • Multiple legacy systems
Conclusion

• Believe there are scale economies

• Significant costs – *Result, Technology Gap*
  – wholesale trading, customer services-billing, contact center & customer relations system

• Competition – *Result, Scale and TCE*
  – Introduced customer choice, disaggregation, spot market increased the complexity of transacting, risk & cost.

• Regulation – *Result, Capture theory*
  – was not considered a source of scale economies.
Scale Economies

- **Theory** Production Function– Relationship inputs and outputs over time
- **Result** average costs of output declines as output increases
- **Graphically** U, L, W shape on cost/output axis
- **Dominate influential Costs** Fixed
- **Sources of Scale** Resource–Assets, labor Firm structure