ENERGEX is located in South East Queensland
Network Description

- 1.2m Customers
- 25,000 km Area
- 47,000 km of lines and cables
- 220 Substations
- 39,000 Distribution Transformers
- 250,000 Streetlights
- 4200 MW Annual System Demand
- >$3.0B capital program over 5 years
South East Queensland Environment

- High growth in customers and population 3-4%
- High growth in electrical demand 9% average over the 3 years to summer 2004/05
- Sub tropical environment with areas of high rainfall and rapid vegetation growth
- Periods of sustained high temperatures and humidity

Note: Lightning images have been used with the kind permission of Mr Gary Brooke.
South East Queensland Environment

- Second highest lightning intensity of Australian Capital Cities
- Subjected to severe electrical storms with high speed damaging wind gusts
- Coastal environments with high levels of salt spray

Note: Lightning images have been used with the kind permission of Mr Gary Brooke.
Collaboration areas

• ENERGEX + Brisbane and Gold Coast City Councils
  - Scoping study by CSIRO and SEDA

• ENERGEX + Ergon + Powerlink
  - A full understanding of the range of network DM programs, tools and technologies available to manage Network Demand
  - Detailed cost/benefit analysis on the range of practical alternatives
  - Creation of a satisfactory regulatory framework to support investment in network DM initiatives as approved regulatory expenditure
  - Develop effective marketing strategies
Research areas

- Research and trials
  - End use studies
  - Customer profiling
  - Advanced metering
  - TOU tariffs
  - DLC
  - kV.A tariffs
  - Energy efficiency
  - Appliance control standards

Air Conditioning purchasing trends and saturation
Customer surveys
Interval meter trial
Ecovillage collaboration
Smart meter / TOU trial
Demand response trial
kV.A tariff proposal
Network DSM studies - ieaDSM
Estimation of the Value of Water Heating Control to ENERGEX Network
Basis of Analysis

• Reviewed ENERGEX’s hot water Audio Frequency Load Control (AFLC) capability which has been in place for over 30 years

• Estimated Winter and Summer impacts of load shifting

• Estimated value of benefit cost framework based on deferral of network capital investment
ASSUMPTIONS

• 500,000 T33 (18 hrs on per day) customers
• 200 Zone substations
• Avg. T33 DSM load / customer
  • Winter 0.70 kW
  • Summer 0.14 kW
• Demand growth 5.0% pa (summer)
• Demand growth 3.0% pa (winter)
• 200,000 T31 (9hrs on per day) customers
• Similar demand impact to T33

• Estimated Capacity cost $1.25M / MVA deferred
• Discount rate 6.5% pa
• Term 25 years
• AFLC cost / substation $200K
• AFLC relay / customer $80
<table>
<thead>
<tr>
<th>Representative Substation Load (% Normal Cyclical Load)</th>
<th>50%</th>
<th>75%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Peaking NPV</td>
<td>$101M pa</td>
<td>$71M pa</td>
<td>$125M pa</td>
</tr>
<tr>
<td>Summer Peaking NPV</td>
<td>$48M pa</td>
<td>$46M pa</td>
<td>$8M pa</td>
</tr>
<tr>
<td>Weighting in Network (estimated % of Subs at nominated Load)</td>
<td>25%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>Winter Peaking Network NPV</td>
<td></td>
<td></td>
<td>$99M pa</td>
</tr>
<tr>
<td>Summer Peaking Network NPV</td>
<td></td>
<td></td>
<td>$37M pa</td>
</tr>
</tbody>
</table>
AVG. COSTS & CUSTOMER BENEFITS

T33 Network benefit / customer pa
- $75 (summer) - $199 (winter)
T31 estimated at 40% more than T33
- $30 (summer) - $80 (winter)

Network direct cost / customer pa
- AFLC Equipment $4.68
- Relays T33 & T31 $6.55

Retail also derives non-quantified benefits from this common infrastructure

Customer benefit pa (tariff saving) based on difference between Peak and off peak tariff rates applied to average water eating kWh
- T33/T31 avg. 2.9 MWh pa
- T33 $156 pa
- T31 $188 pa

Note Savings derive from Network & Retail collectively in this analysis
## Effectiveness Evaluation for T33 Water Heating

### TABLE 1. EXTERNAL SUCCESS FACTORS FOR THE NETWORK-DRIVEN DSM PROJECTS IN THE TASK XV CASE STUDY DATABASE

<table>
<thead>
<tr>
<th>Project</th>
<th>Government Policies</th>
<th>Regulatory Regime</th>
<th>Market Structure</th>
<th>Commitment by Project Proponent</th>
<th>Technology Availability</th>
<th>Commercial Considerations</th>
<th>Public Relations Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Water heating Load Control</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<th>Project</th>
<th>Project Objectives</th>
<th>Target Market</th>
<th>Demand-side Measures Used</th>
<th>Barriers Addressed</th>
<th>Outreach and Marketing</th>
<th>Participation Process &amp; Customer Service</th>
<th>Delivery Mechanisms</th>
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