Timber Queensland

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Aim of presentation

Where there is a need for new capacity in the grid, distributors can invest in augmenting the grid or invest in energy efficiency and distributed generation.

Nationally the Australian Network operators are planning to spend over $40 billion over the next five years on the grid

There has to be a better more sustainable way

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Topics to be covered

Customer demand growth in South East Queensland

ENERGEX response - program of work

What is possible - options for managing demand

Where are we headed – customer participation

Summary

ENERGEX

Electricity distributor SEQ

$8B+ assets

1.3M customers

36,000 km overhead lines

13,000 km underground cables

600,000+ poles

249 zone & bulk supply substations

43,000 distribution transformers

300,000 street lights

3,800+ staff
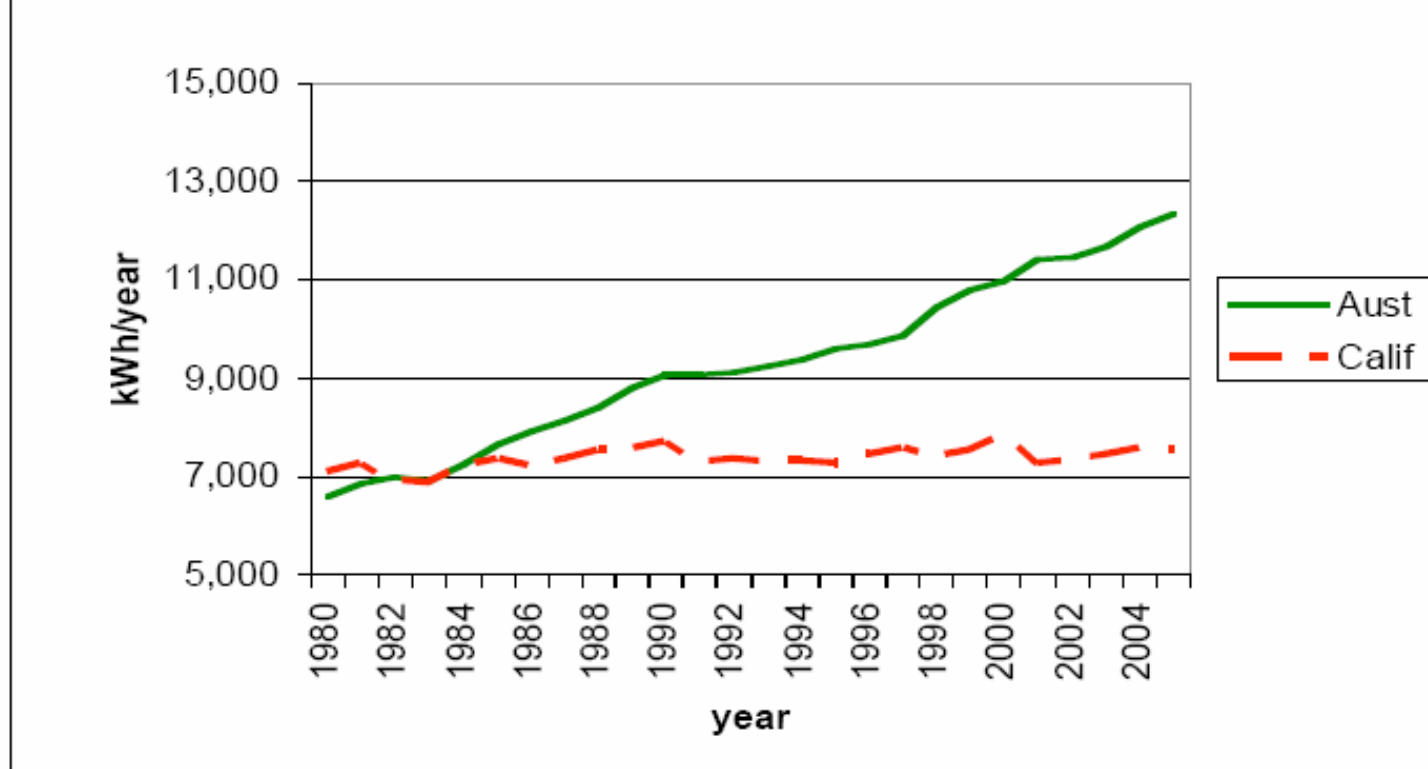
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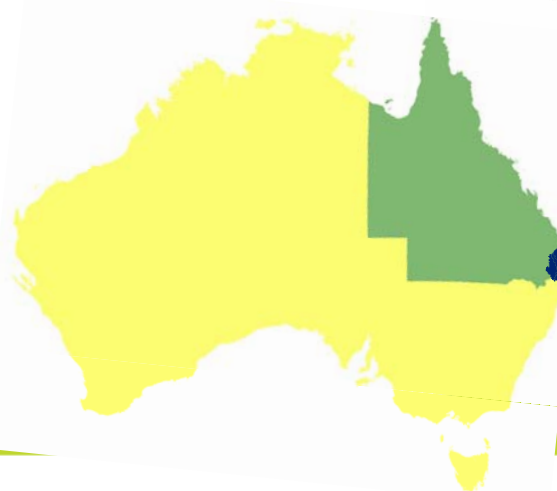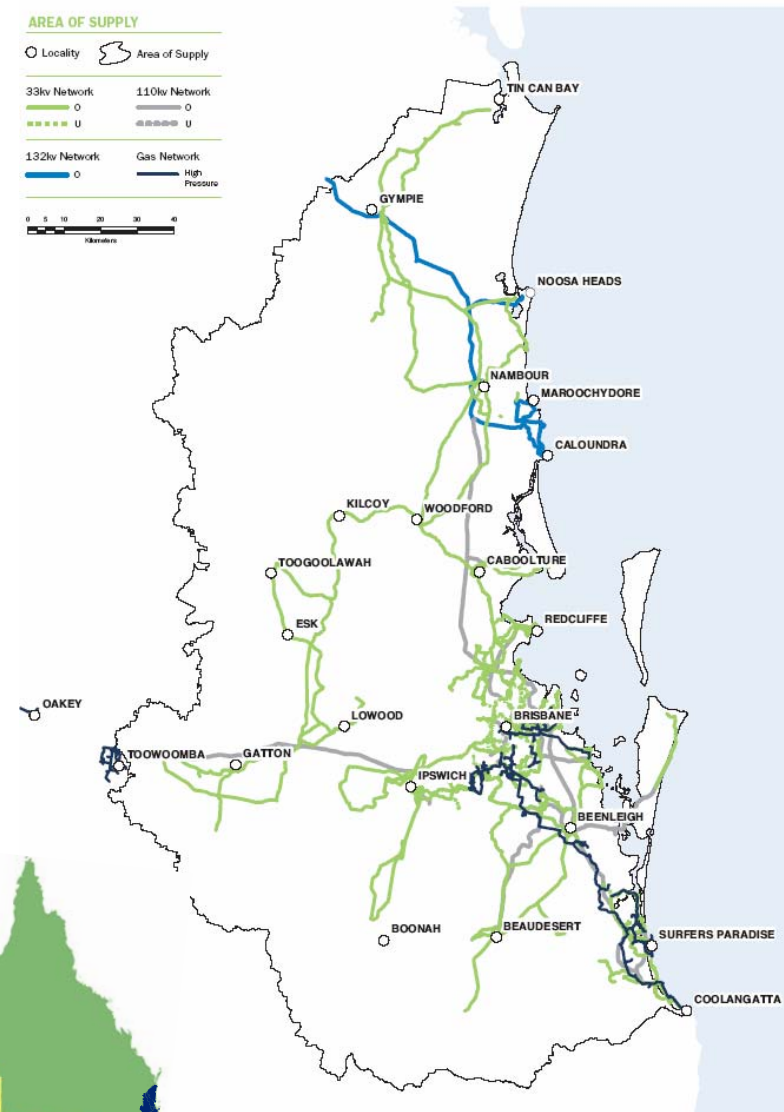
"Today, in much of the world we take energy for granted… We treat it as a right and we're careless in its use… In order to reliably meet that greater energy need, power companies have to invest in additional capacity which is unused for much of the day."

- Russell Caplan, Chairman of Shell companies in Australia

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Sources: Australian Bureau of Statistics n.d.; California Energy Commission 2006; Real Estate Center 2006; Australian Bureau of Agricultural and Resource Economics 2006.

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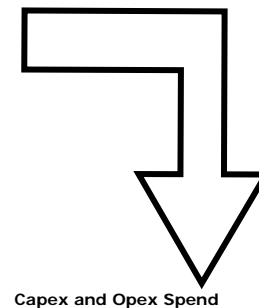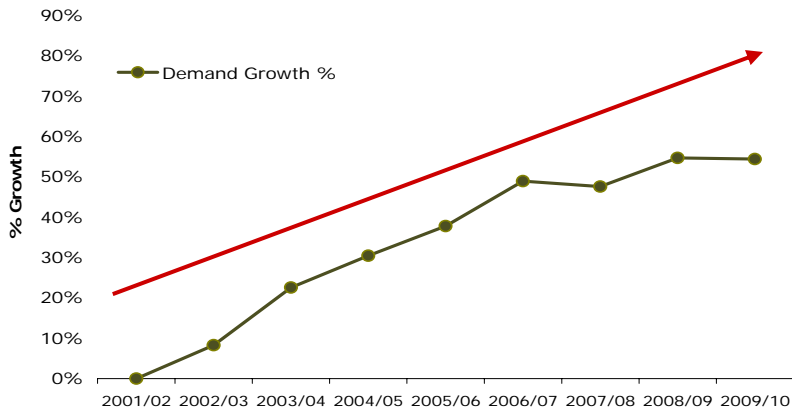
The changing South East Queensland Home

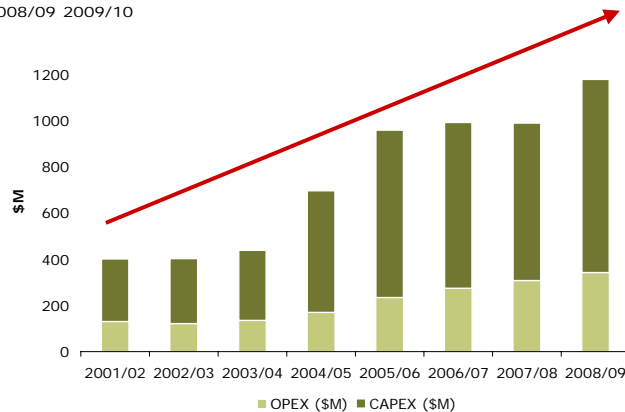| **Appliances**	**1999**	**2009**
SEQ homes with A/C	23%	72% (34% with 2 or more)
Homes with at least one PC	48%	98%
Number of TV's in avg SEQ family	1.%	3.0 (25% are high energy use)
SEQ homes with a dishwasher	31%	50%
Microwave ovens (less than 30% in 1989	72%	97%

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Customer demand drives prices – vicious cycle

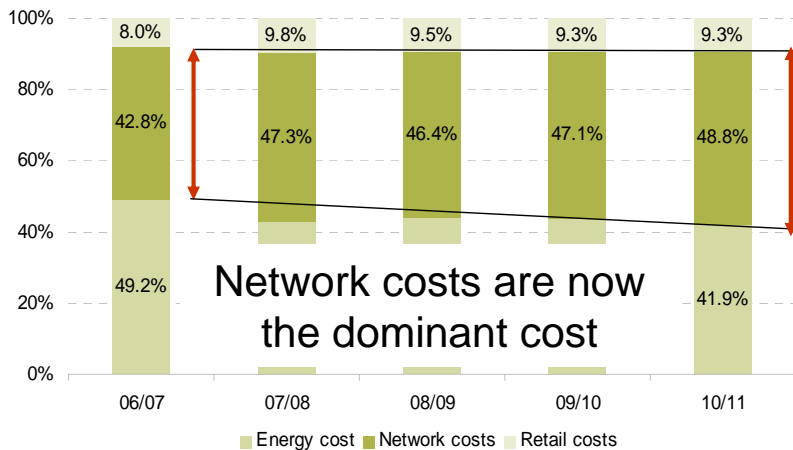**Peak Demand Growth**

Capex and Opex Spend

BRCI

Network costs are now the dominant cost
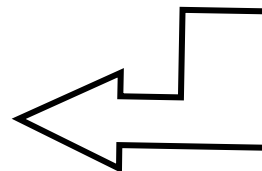
Growth in South East Queensland

Every working day 120 new, additional homes and businesses connect to the south east Queensland electricity grid – that's a new connection every four or five minutes

	1996/97	2009/10	% increase
Customer numbers	960,000	1,300,000	35%
System maximum demand	2308MW	4713MW	104%

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Energy & Demand growth in South East Queensland
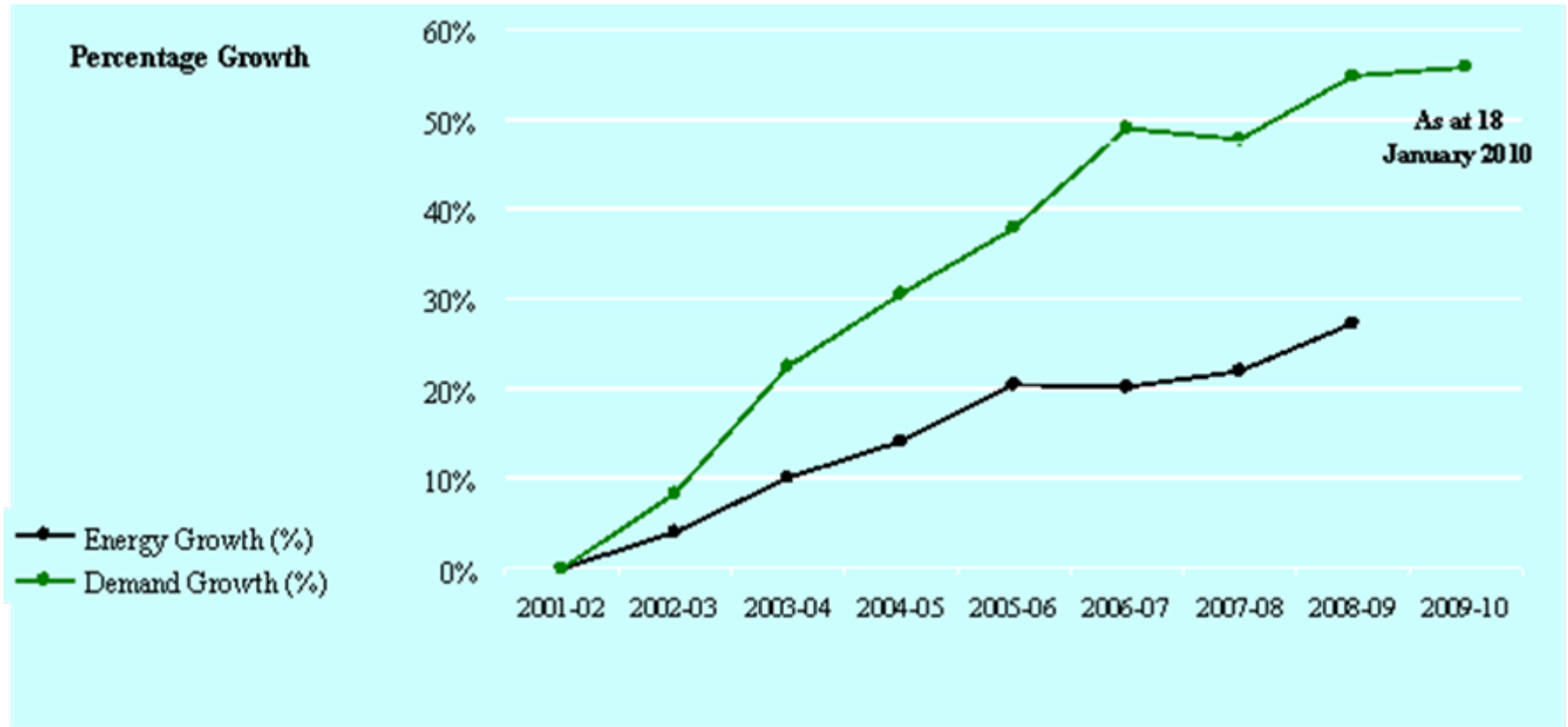
Load duration curve 2008/09

Estimated at 15 GWh

$7.52 / kWh

18 GWh in 2006/07

= 20% increase in 2 yrs

MW 2008/09

Total delivered =
23,535 GWh
$0.037 / kWh
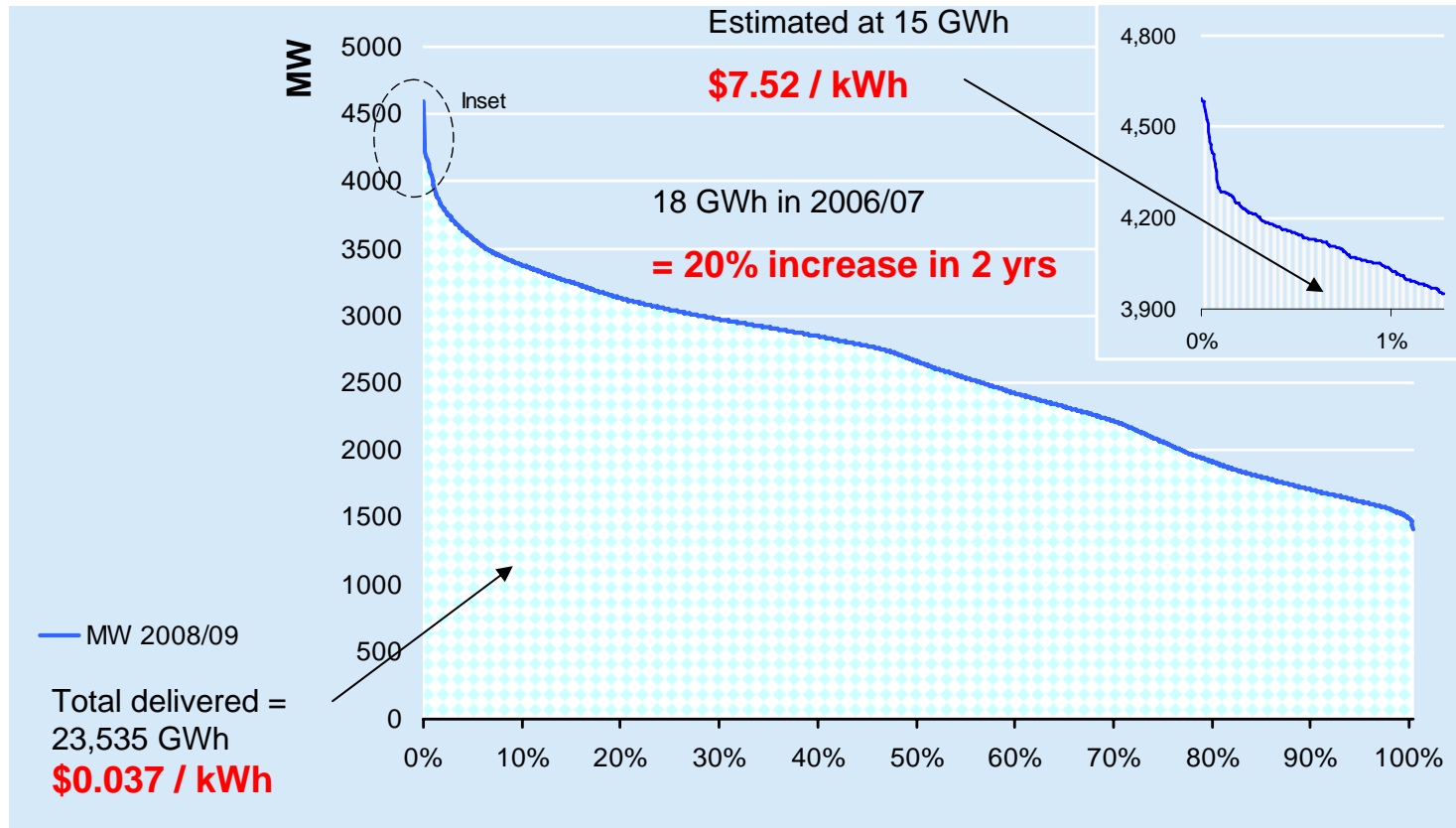
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Customers in SE QLD have also moved from winter night to summer day peak

ENERGEX Demand Curves - Winter Monday 28 July 2008, Summer Saturday 23 February 2008, Summer 9 February 2009

Winter 2008 — Summer 2007/08 — Summer 2008/09
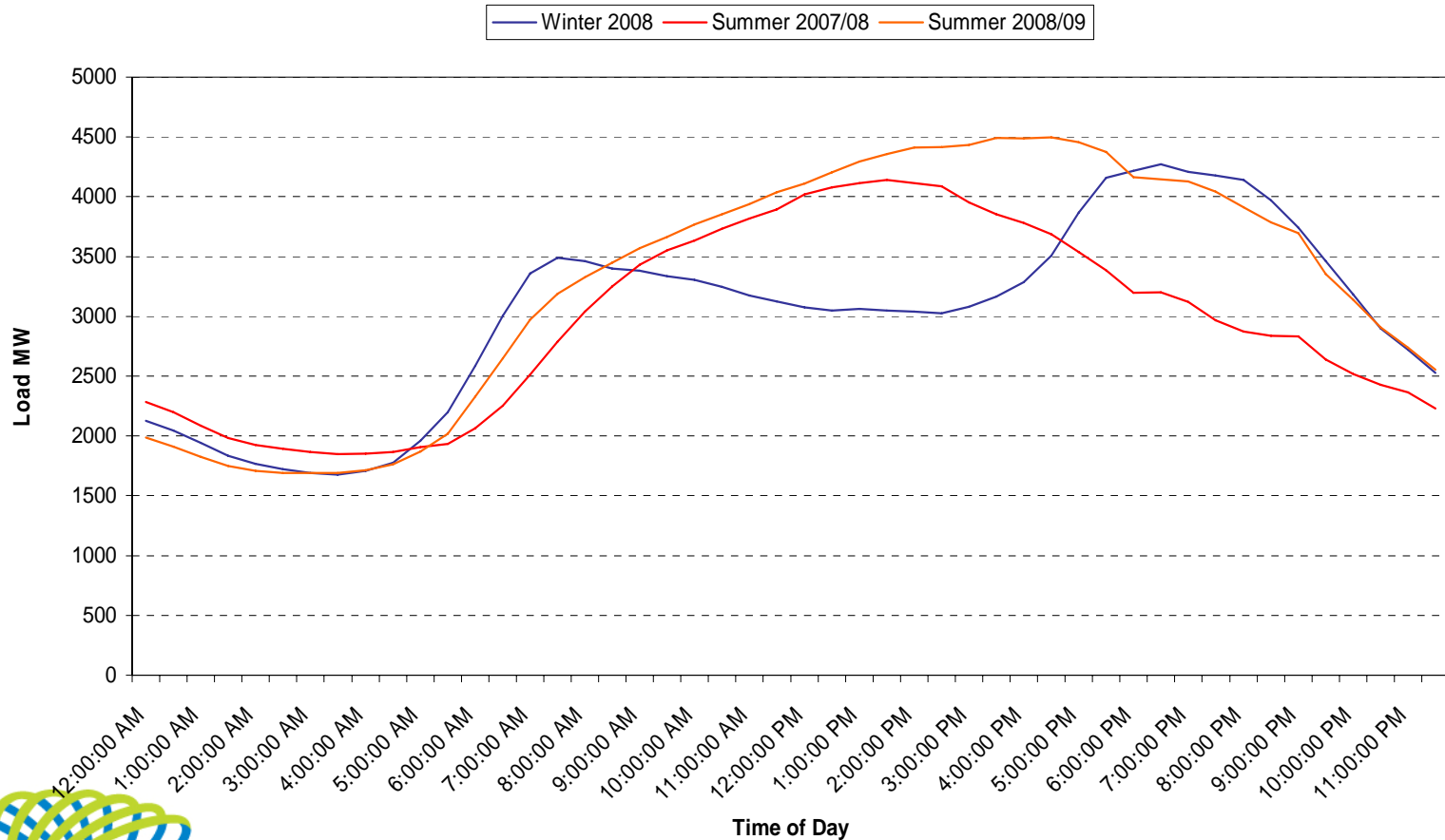
There are many opportunities in various customer groups for both energy conservation and demand management
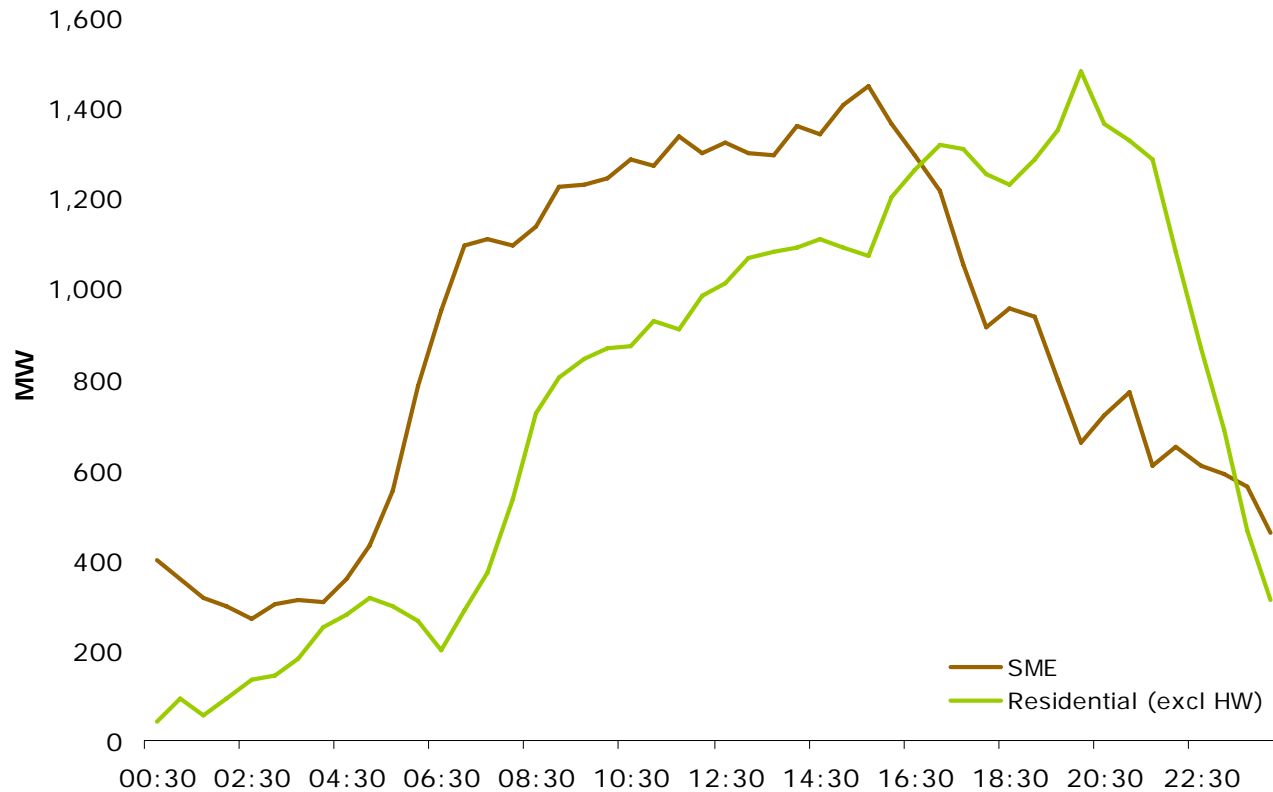
ENERGEX residential and SME daily load curve on system peak day

Northern Corridor Mango Hill

Mango Hill - 1995

Mango Hill - 2009

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Air Conditioning - Growth

Gold Coast households .. Air Conditioners

Legend: Households .. Percentage with Air Conditioning | Number of A/C's

Data points:
- 2004: 50%, 87004
- 2005: 59%, 105088
- 2006: 63%, 116987
- 2007: 67%, 138476
- 2008: 70%, 149465

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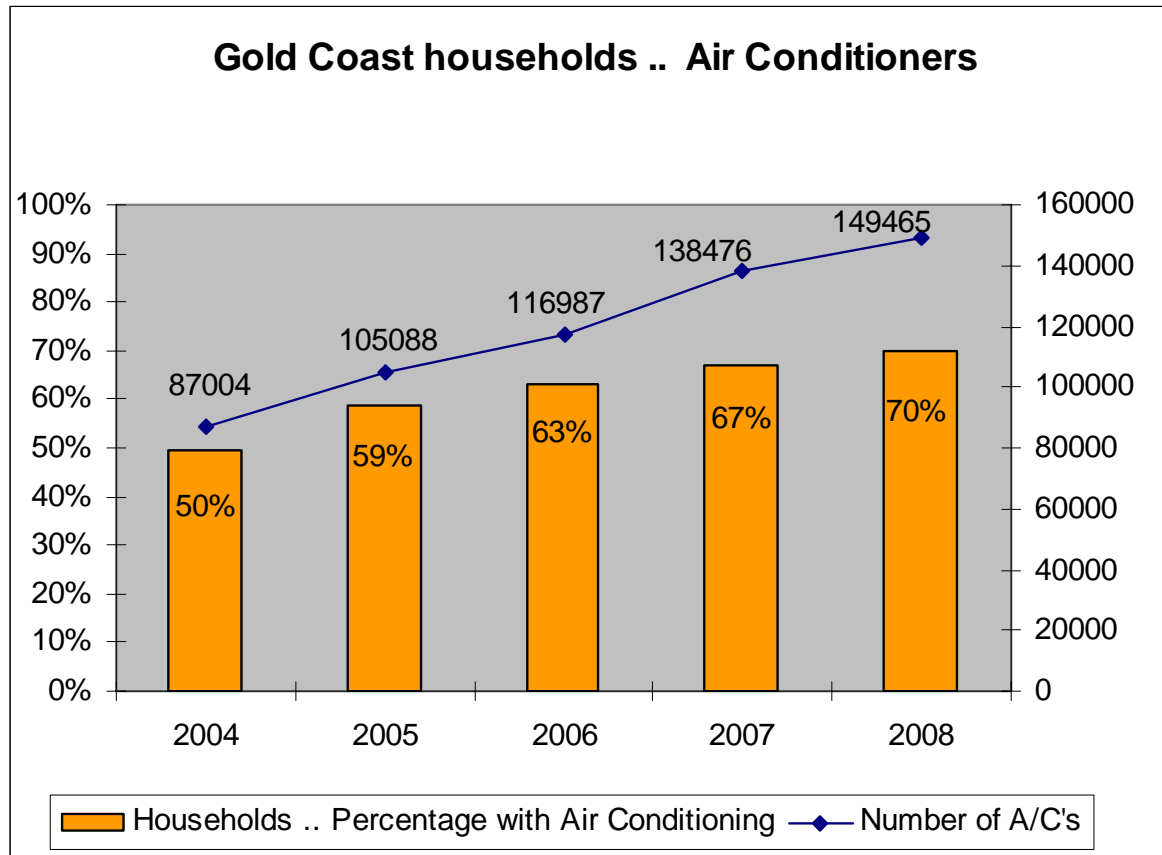
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Traditional approach to managing growth

Historical Capital and Operating Expenditure

Chart — Historical Capital and Operating Expenditure ($M), 2001-02 to 2008-09.
Legend: ■ Capital Expenditure, □ Operating Expenditure.

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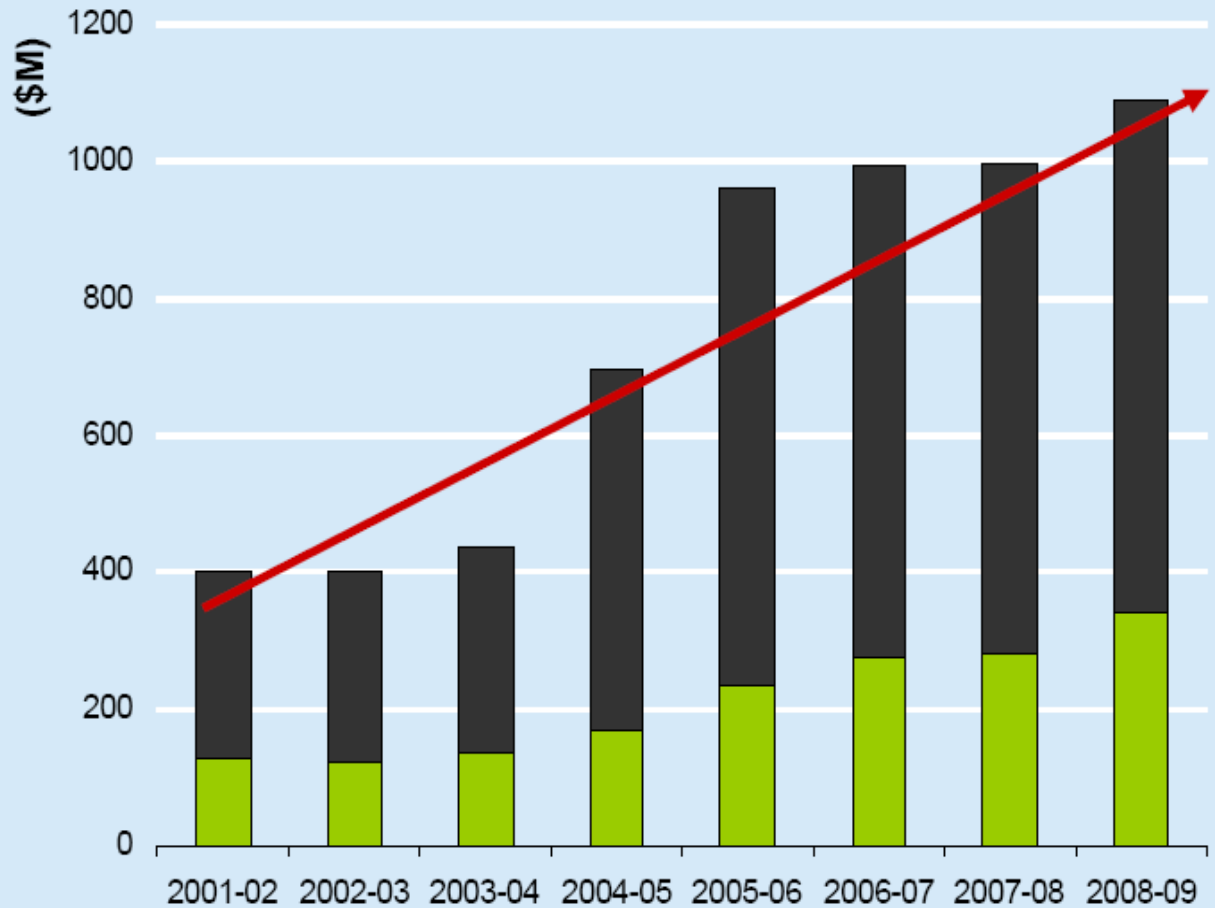
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Issues with traditional approach

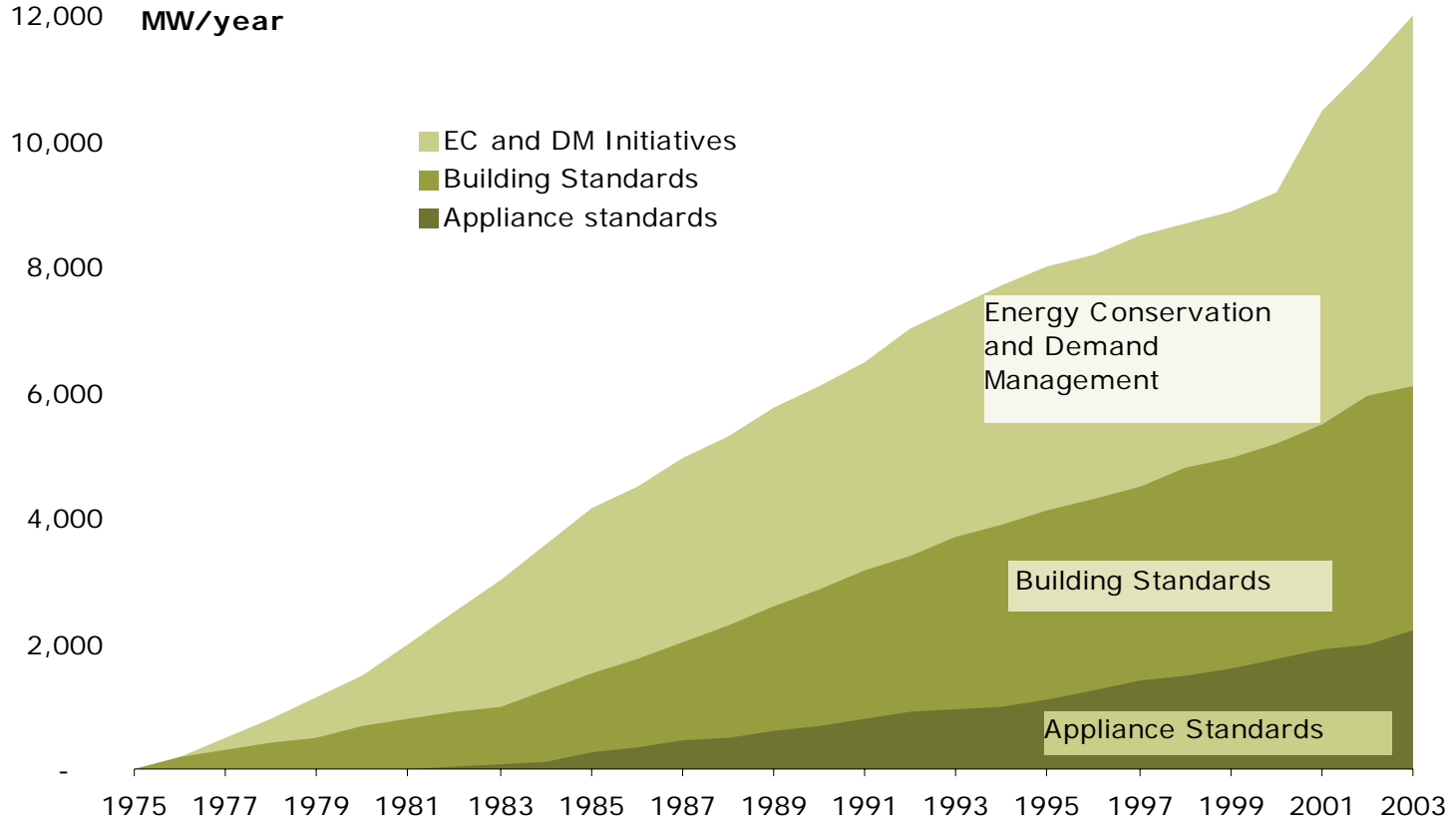Network reinforcement is expensive for relatively short duration demand peaks – is this the optimal use of scarce capital?

Customers pay an average price for electricity and do not see the impacts of peak demand

Environmental sustainability of supply side solutions all the way along the supply chain

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There is another way…

Annual Peak Savings from Efficiency Programs and Standards: California

Business Drivers for Changing BAU

structural changes to the **primary fuel markets** driving higher costs;

customers demanding improved service and greater choice / participation in managing their energy needs/costs;

aged assets coupled with **high summer growth** rates requiring significant capital investments;

the emergence of the **digital economy** with a heavy reliance on an "interruption free" electricity supply;

the drive to a **lower carbon** world and a greater emphasis on renewables and broader environmental stewardship; and

an **emerging technological** shift that will offer economic alternatives and distribution energy resources (DER).

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What will these choices mean for customers?

Option 1 - If the current situation continues:

Customers will have:

⬆ Energy bills

⬆ Cost of living

⬆ Pollution & emissions

\+ No ability to manage their energy bill

\= **Loss of personal control …who to blame??**

Option 2 - If we start now to develop customer choices:

Assist customers to:

☑ Reduce their energy consumption

☑ Better manage their energy bill

☑ Manage their impact on environment

\= **More choice and greater personal control**

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Design Program to Meet Customer and Utility Needs

The Right Program Will Have Substantial Mutual Benefit

Reduce Cost

Reduce Needs

Maintain Lifestyle

Satisfy Desires

Increased Value of Service

Reduce Capital Requirements

Improve Financial Performance

Increase System Utilization

Reduce Capacity Needs

Enhance Image of Utility & Industry

Customer Needs — **Mutual Benefit** — **Utility Needs**
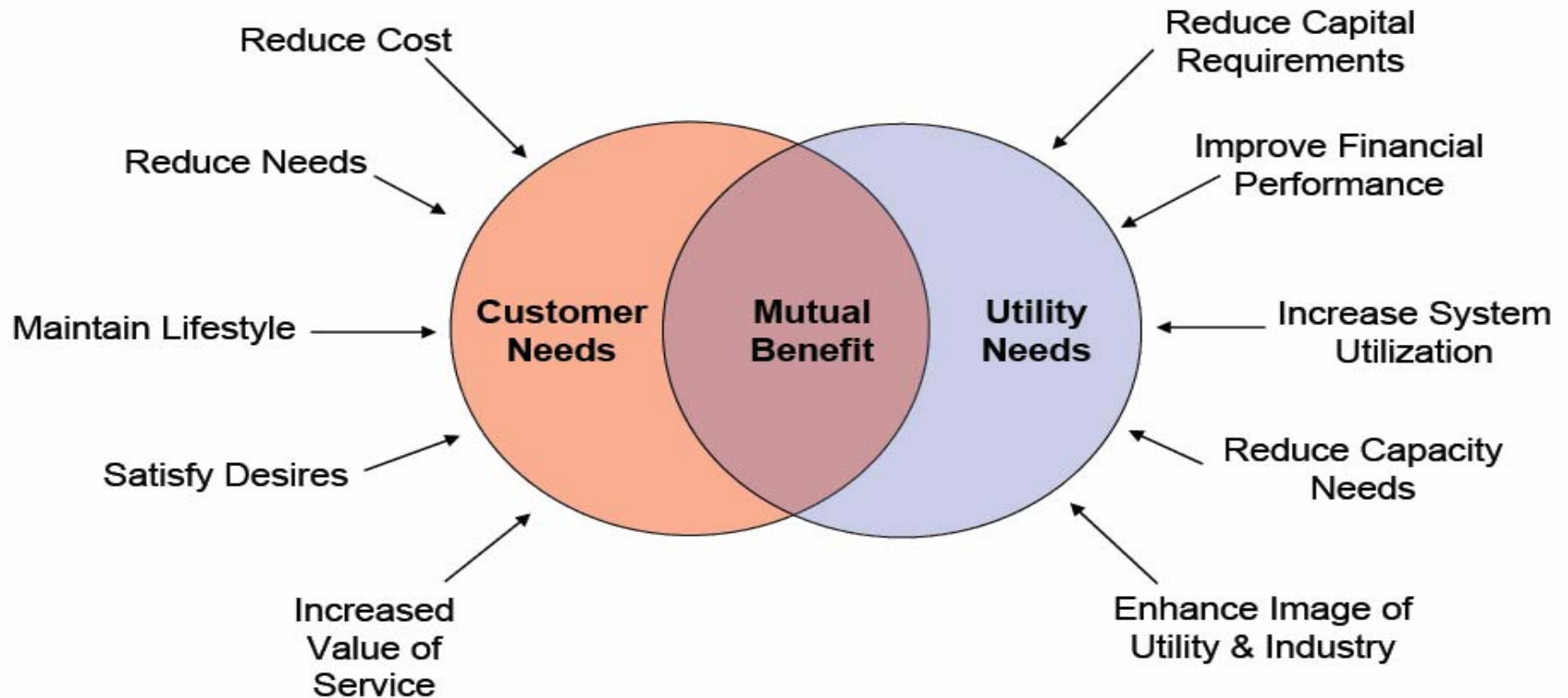
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Intelligent Network

Maximising PHEV Value
Utilising storage
Minimise grid impacts

Seamless Renewable Integration
Two-way flows of energy
Real time Volt / Var control

Real time Feeder Mgmt
More sensors
Embedded storage
Condition monitoring
Transformer intelligence
Load Management

Open Standards

SMART GRID

Information Model

Enabled Customers
Integrated Demand Mgmt
Enabled smart meters
More choices
Appliance Mgmt
AMI and AFLC

Enable Customer PV
Integrate to smart meters
Utilise in system forecasts
Enhance value with storage

Energy / Demand efficient buildings
Integrated building management
Reduced demand / energy footprint

Source – US Dept Energy

Understanding the Future

Energy Conservation & Demand Management programs to 2015

2009/10 Programs

….continuing into 2010 and beyond…

Residential targeted initiatives	Air conditioning direct load control
	Pool pump direct load control

	Hot water optimisation
	Convert hot water to off-peak

DM for C&I customers	DM for C&I customers	Lighting, HVAC, Fuel substitution

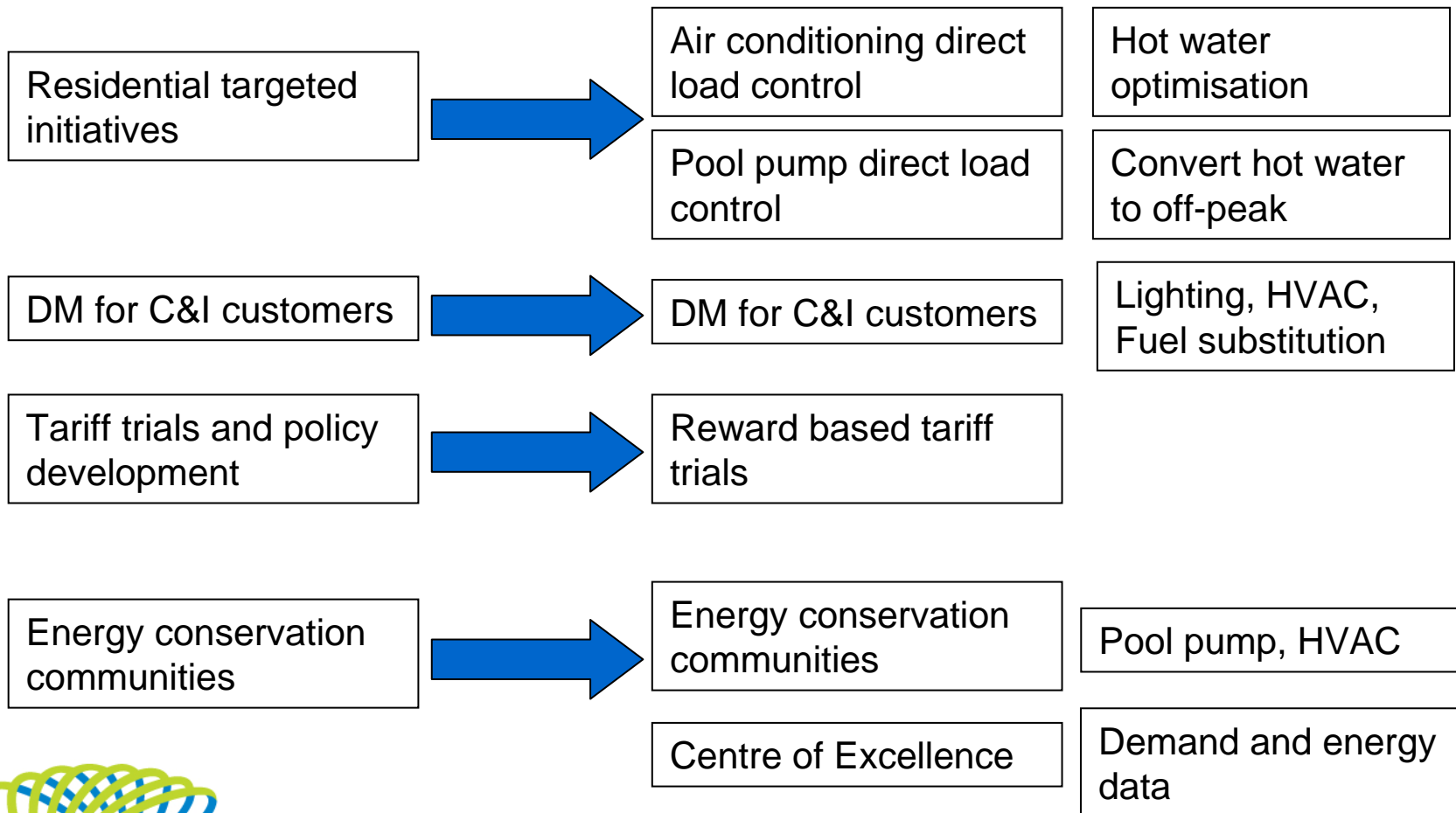|	
Tariff trials and policy development	Reward based tariff trials

Energy conservation communities	Energy conservation communities	Pool pump, HVAC
	Centre of Excellence	Demand and energy data

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Distributed Energy

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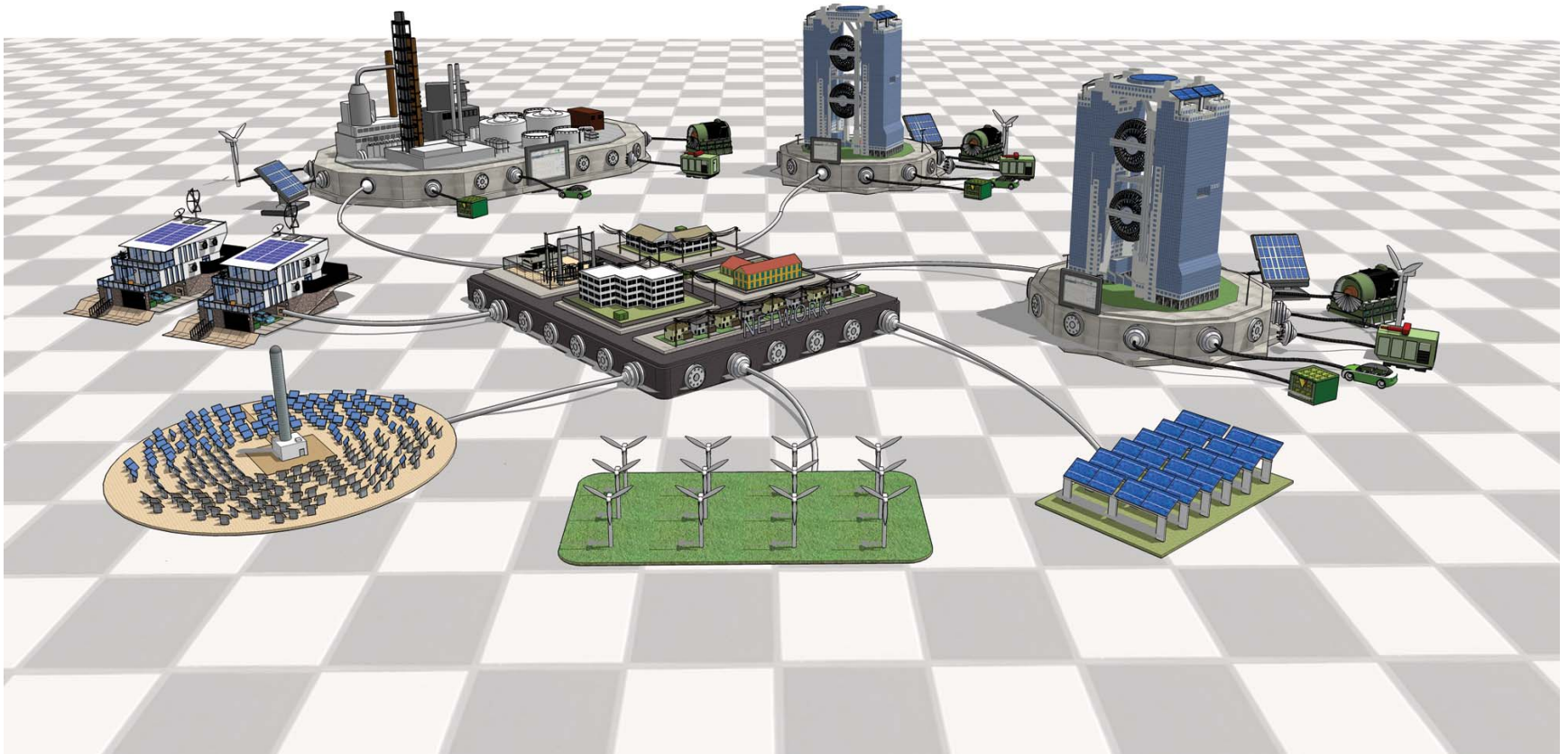
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One view of the future

Summary

Long term least cost will be achieved by the optimum mix of conventional supply-side solution integrated with Energy Conservation and Demand-side initiatives

Demand-side initiatives are not a silver bullet and will only have marginal impacts in the short-term

Distributors can play a part in influencing customers to modify their energy use behaviour

Reducing peak demand has favourable climate change impacts through reduced capital infrastructure requirements

Effective price signals will be a key element in encouraging the right sort of response by customers

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Key Messages

The greenest kWh is the one we don't use – energy conservation is the starting point.

ENERGEX is about to significantly expand its EC & DM programs via its 2010-2015 regulatory submission.

Time of Use is also key to the reduction in the overall carbon footprint.

The integration of renewables (particularly Micro-generation) will require a more intelligent network

Customer enablement and participation are key.

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