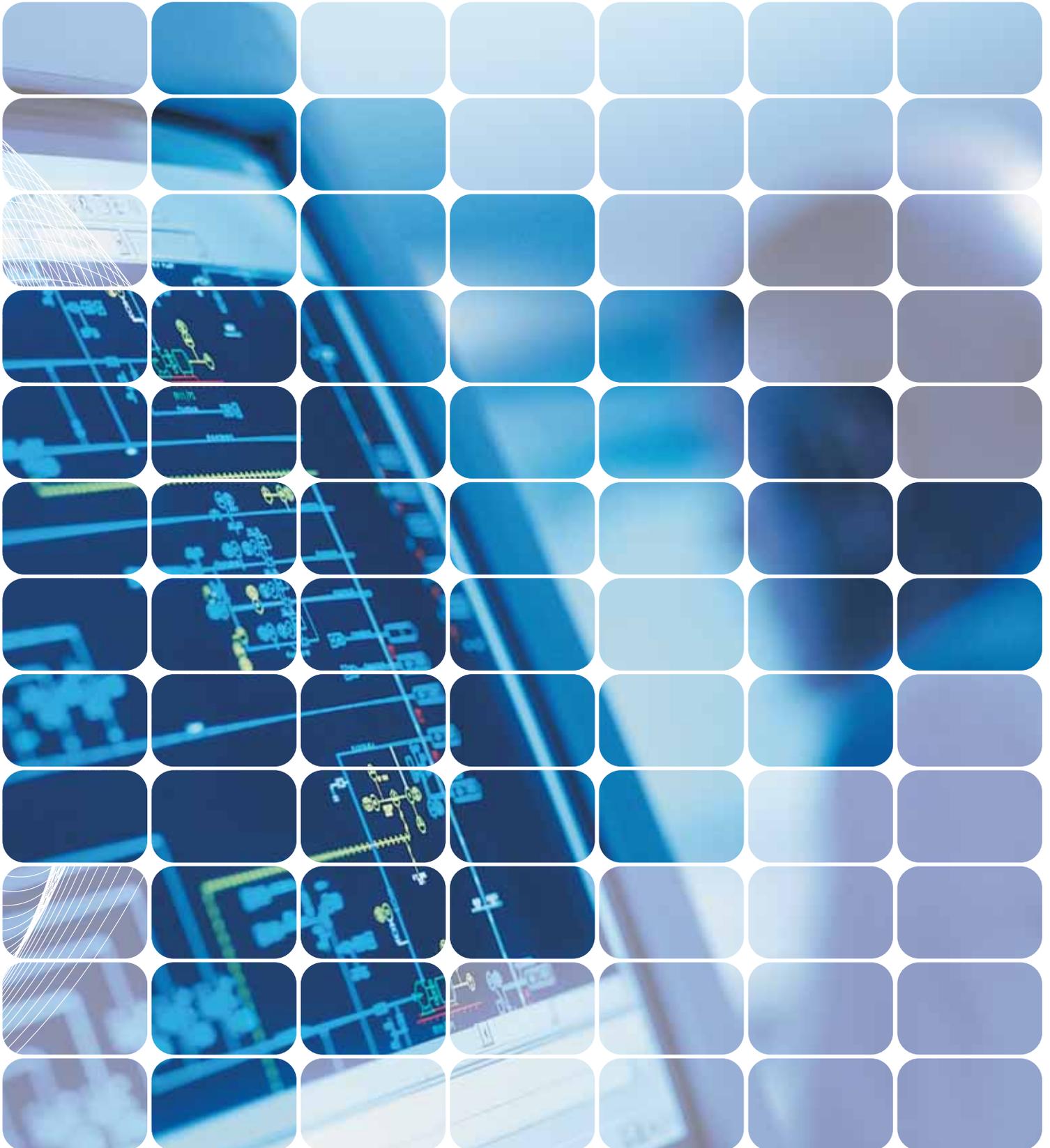


# Demand Side Management in Ireland

EVALUATING THE ENERGY EFFICIENCY OPPORTUNITIES

*Appendices*



**Demand Side Management in Ireland**  
**Evaluating the energy efficiency opportunities**

**APPENDICES**

## Table of Contents

Appendix A – International DSM Programmes.....	2
1. Overview of International Programmes.....	3
2. UK Demand Management Services.....	10
3. Canadian Demand Management Programs.....	46
4. Japanese Demand Management Services.....	62
5. New Zealand Demand Management Services.....	80
6. Vermont.....	86
7. Other International Programmes.....	94
Appendix B – KEMA’s DSM ASSYST™ Model.....	112
Appendix C – Assumptions in the Modelling.....	116
Appendix D – Indicative Programme Designs for Ireland.....	124
1. Residential Programmes.....	125
2. Commercial / Industrial Programmes.....	137
3. Budgets and Savings for Proposed Programmes.....	147
4. Pilot Only Programmes.....	152
5. Suggested Measures for Business Customers Grants Programme.....	156

## **Appendix A – International DSM Programmes**

This section considers Demand Side Management (DSM) programmes that currently exist in a number of key countries in order to assess what may be applicable for Ireland. The assessment starts with an overview of all the programmes considered based on whether they are primarily focussed on energy efficiency or on peak load reduction. A number of these programmes will achieve both peak demand reductions and energy savings.

The review looks at the following countries/states.

- UK – similar climate and electrical standards to the Ireland;
- Canada – innovative DSM programmes;
- Japan – short of natural resources;
- New Zealand – two small islands with limited interconnection and cold spells;
- Vermont – one of the most aggressive states in pursuing Demand side management

In addition a subset of other international programmes that may provide useful lessons for Ireland are also included. This includes examples from the California, Texas, Denmark and Italy.

## **1. Overview of International Programmes**

Before a detailed examination of the international programmes, it is worthwhile considering at a higher level the key objectives the programmes are designed to achieve and the relative numbers of the different types of programmes. All the programmes have therefore been considered assessed against these objectives which were defined as:

- Energy efficiency focused on implementation of building, lighting and/or appliance improvements (BL&A);
- Energy efficiency focused on behavioural change and/or improved Information (BC&I); or
- Peak Demand reduction (PD) programmes.

Some of the programmes have multiple aims and this is indicated in the tables below. Additional information is also provided on the fuel that is saved by each of the programmes. With the exception of peak demand reduction programmes, the majority of programmes provide savings across all fuels.

### **1.1 Implementation focussed Energy Efficiency Programmes**

The most common programmes for both business and domestic customers were those aimed at implementation of energy efficient equipment to improve the underlying energy efficiency of homes, commercial establishment and industrial facilities. All countries ran multiple programmes in this area with the majority being separate initiatives for business and domestic customers.

Some assessment has also been included as to whether the programmes were primarily aimed at new premises or at retrofit of existing premises. Most programmes were either aimed at retrofit or all property types with only Vermont and Japan having specific new construction programmes.

A summary of these programmes is shown the table below.

**Table 1-1  
Domestic Customers Energy Efficiency for Homes and Appliances**

<b>Programmes</b>	<b>Country</b>	<b>Customer</b>	<b>Main Target</b>	<b>Fuel</b>	<b>New/Retrofit</b>
The Energy Efficiency Commitment	UK	D	EE – BL&A	All	Retrofit
Warm Front	UK	D (P)	EE- BL&A	All	Retrofit
Reduced VAT on Energy Saving Materials	UK	D	EE- BL&A	All	Retrofit
Power Smart at Home	Can	D	EE- BL&A	Electricity	Both
Cool Savings Rebate	Can	D	EE- BL&A	Electricity	Retrofit
Every Kilowatt Counts	Can	D	EE- BL&A, BC&I	Electricity	Retrofit
Low Income Conservation and Demand Management	Can	D	EE – BL&A, BC&I	Electricity	Retrofit
Residential Energy Efficiency	Can	D	EE – BL&A, BC&A	All	Both
Top Runner Programme	Japan	B <sup>1</sup> /D	EE – BL&A	Electricity	Both
Eco Support Plan	Japan	B/D	EE- BL&A	Electricity	Retrofit
Subsidies for Energy Management System	Japan	D	EE- BL&A	All	Both
EnergyWise Home Grants	NZ	D	EE- BL&A	All	Retrofit
Solar Water Heating	NZ	D	EE – BC&I, BL&A	All	Both
Residential Energy Services: Retail Efficient Products	Vermont	D	EE- BL&A	Electricity	Both
Existing Residential Homes	Vermont	D	EE – BL&A	All	Retrofit
Residential New Construction	Vermont	D <sup>2</sup>	EE – BL&A, BC&I	All	New

<sup>1</sup> Aimed at manufacturers but end beneficiaries are often domestic

<sup>2</sup> Programmes is aimed at domestic premises but some of the grants and assistance would go to builders

**Table 1-2  
Business Customers Energy Efficiency for Commercial Establishments and Industrial Facilities**

<b>Programmes</b>	<b>Country</b>	<b>Customer</b>	<b>Main Target</b>	<b>Fuel</b>	<b>New/Retrofit</b>
Negotiated Energy Agreements	UK	B	EE – BL&A	All	Retrofit
Energy Efficiency Loans	UK	B	EE – BL&A	All	Retrofit
Enhanced Capital Allowances	UK	B	EE- BL&A	All	Retrofit
Power Smart for Business	Can	B	EE- BL&A, BC&I	Electricity	Both
Canadian Industry Programme for Energy Conservation	Can	B	EE- BC&I, BL&A	All	Retrofit
Top Runner Programme	Japan	B <sup>3</sup> /D	EE – BL&A	Electricity	Both
Eco Support Plan	Japan	B/D	EE- BL&A	Electricity	Retrofit?
Energy Reform Tax System	Japan	B	EE – BL&A	All	Retrofit
Energy Conservation Assistance	Japan	B	EE- BL&A	All	New
Emprove	NZ	B	EE – BL&A	All	Retrofit
Existing Business Facilities Assistance	Vermont	B	EE – BL&A	All	Retrofit
Business New Construction Assistance	Vermont	B	EE- BL&A, BC&I	All	New
Customer Credit Program	Vermont	B	EE – BL&A, BC&I	All	Both
Voluntary Agreement on Energy Efficiency in Trade and Industry	Denmark	B	EE – BL&A,	All	Retrofit

## **1.2 Behavioural Change and Improved Information Programmes**

Behavioural change and improving the information available for customer to make informed decisions regarding potential energy efficiency opportunities have also become increasingly important in the last few years. Some of the domestic programmes have been heavily advertised on television, and radio, whilst the business programmes are often a pre-requisite to being able to take the action facilitated by the more implementation based programmes above.

The programmes targeted primarily at Behavioural Change and Improved Information are shown in the tables below.

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<sup>3</sup> Aimed at manufacturers but end beneficiaries are often domestic

**Table 1-3  
Domestic Customers Energy Efficiency for Behavioural Changes and Improved Information**

<b>Programmes</b>	<b>Country</b>	<b>Customer</b>	<b>Target</b>	<b>Fuel</b>
Commit to Save your 20%	UK	D	EE- BC&I	All
Every Kilowatt Counts	Can	D	EE- BL&A, BC&I	Electricity
Low Income Conservation and Demand Management	Can	D	EE – BL&A, BC&I	Electricity
Residential Energy Efficiency	Can	D	EE – BL&A, BC&A	All
ECO <sub>2</sub> Support	Japan	D	EE – BC&I	Electricity & Gas
Energy Saving Labelling Programme	Japan	B <sup>4</sup> /D	EE- BC&I	Electricity
Energy Efficient Product Retailer Assessment System	Japan	B (D) <sup>5</sup>	EE-BC&I	Electricity
Energy Efficiency of Products	NZ	B /D	EE- -BC&I	All
Home Energy Ratings Scheme	NZ	D	EE- BC&I	All
Solar Water Heating	NZ	D	EE – BC&I, BL&A	All
Residential New Construction	Vermont	D <sup>6</sup>	EE – BL&A, BC&I	All

4 Business will need to label products but domestic and business customers will gain from increased knowledge

5 Targeted at retailers but will assist domestic customers in selecting more energy efficient appliances

6 Programme is aimed at domestic premises but some of the grants and assistance would go to builders

**Table 1-4  
Business Customers Energy Efficiency for Behavioural Change and Improved Information**

Programmes	Country	Customer	Target	Fuel
Energy Saving	UK	B	EE- BC&I	All
Carbon Management	UK	B	EE – BC&I	All
Networks Initiative	UK	B	EE-BC&I	All
Energy Efficiency Accreditation Scheme	UK	B	EE- BC&I	All
Power Smart for Business	Can	B	EE- BL&A, BC&I	Electricity
Canadian Industry Programme for Energy Conservation	Can	B	EE- BC&I, BL&A	All
Top Runner Programme	Japan	B <sup>7</sup> /D	EE – BL&A	Electricity
Eco Support Plan	Japan	B/D	EE- BL&A	Electricity
Energy Saving Labelling Programme	Japan	B <sup>8</sup> /D	EE- BC&I	Electricity
Energy Efficient Product Retailer Assessment System	Japan	B (D) <sup>9</sup>	EE-BC&I	Electricity
Energy Controlled Designated Factories	Japan	B	EE- - BC&I	All
Energy Audits	Japan	B	EE- BC&I	All
Energy Efficiency of Products	NZ	B <sup>10</sup> /D	EE- -BC&I	All
Business New Construction Assistance	Vermont	B	EE- BL&A, BC&I	All
Customer Credit Program	Vermont	B	EE – BL&A, BC&I	All
Energy Manager Programme	Italy	B	EE- BC&I	Energy
Voluntary Agreement on Energy Efficiency in Trade and Industry	Denmark	B	EE – BL&A,	All

7 Aimed at manufacturers but end beneficiaries are often domestic

8 Business will need to improve products but customers will gain from increased knowledge

9 Targeted at retailers but will assist domestic customers in choosing more energy efficient appliances

### 1.3 Peak Demand Reduction Programmes

The final set of programmes were those covering peak demand reduction, which only affects electricity as other fuels can be stored. In the countries examined business customers have the most potential in this area both in terms of controllable load and the ability to manage this load and it is therefore unsurprising that most of the programmes are aimed at them. This is shown in the tables below.

**Table 1-5  
Domestic Customers Peak Demand Programmes**

<b>Programmes</b>	<b>Country</b>	<b>Customer</b>	<b>Target</b>	<b>Fuel</b>
Distribution Network Avoidance	UK	B/D	PD	Electricity
Economy 7	UK	B/D	PD	Electricity
Danish Pilot Programme (smart meters)	Denmark	D	PD	Electricity
California Statewide Pricing Pilot	California	D/B	PD	Electricity
Austin Energy Power Partner	Austin (Texas)	D/B	PD,	Electricity

**Table 1-6  
Peak Demand Programmes for Business Customers**

<b>Programmes</b>	<b>Country</b>	<b>Customer</b>	<b>Target</b>	<b>Fuel</b>
Balancing Mechanism	UK	B	PD	Electricity
Demand Turndown Pilot Scheme	UK	B	PD	Electricity
Distribution Network Avoidance	UK	B/D	PD	Electricity
Fast Reserve	UK	B	PD	Electricity
Frequency Response	UK	B	PD	Electricity
Economy 7	UK	B/D	PD	Electricity
Standing Reserve	UK	B	PD	Electricity
Triad Avoidance	UK	B	PD	Electricity
It's Up to You	Can	D/B	PD	Electricity
Demand Response	Can	B	PD	Electricity
Thermal Storage Systems for Air Conditioning	Japan	B	PD	Electricity
Critical Peak Pricing (pilot)	Sweden	B	PD	Electricity
California Statewide Pricing Pilot	California	D/B	PD	Electricity
PJM Load Response Programmes	PJM region	B	PD	Electricity
Austin Energy Power Partner	Austin (Texas)	D/B	PD,	Electricity

The following sections provide a more detailed looks at all these programmes broken down by country.

## 2. UK Demand Management Services

The DSM programmes in the UK have been split according to whether their primary benefits are likely to be energy efficiency or peak load reductions.

<b>Energy Efficiency Programmes</b>	<b>Peak Demand Reduction Programmes</b>
Negotiated Energy Agreements	Balancing Mechanism
Energy Efficiency Commitment	Demand Turndown
Energy Efficiency Loans	Distribution Network Avoidance;
Enhanced Capital Allowance	Fast Reserve
Warm Front	Frequency Response
Reduced Rate of VAT on Energy Saving Materials	Night Time Economy Seven
Commit to save your 20%	Standing Reserve
Energy Survey	Triad Avoidance
Carbon Management	
Networks Initiative	
Energy Efficiency Accreditation Scheme	

## 2.1 Energy Efficiency Programmes

### 2.1.1 Negotiated Energy Agreements

<b>Programme Name</b>	Negotiated Energy Agreements (Part of the Climate Change Levy)
<b>Sponsoring Organisation:</b>	Administered by DEFRA
<b>Description of the Programme</b>	<p>The Climate Change Levy is a tax on the use of energy in industry, commerce and the public sector with offsetting cuts in employers' National Insurance Contributions (NICs). The levy was introduced in April 2001 and is charged for electricity at 0.44p/kWh.</p> <p>In establishing the Levy the government recognised the need for special consideration to be given to energy intensive industries, given their high energy usage and the potential impact of this charge. There are ten major energy intensive sectors and over thirty smaller sectors. Each sector's representative organisation has been in negotiation with the Energy Technology Support Unit (ETSU) to assess what would be a reasonable reduction based on business as usual (BAU), all cost effective (ACE) and all technologically possible (ATP) scenarios. 'Reasonable' reductions have been deemed to be around 60% of the savings shown in the 'All Cost Effective' Scenario.</p> <p>Facilities that are identified in this agreement are eligible for the 80% Levy discount. Eligibility will depend on whether the targets negotiated in previous years have been reached. This leads to large carbon savings as companies invest in energy efficiency improvements.</p>
<b>Purpose</b>	The negotiated agreements were put in place to support industries that use significant amounts of energy and reward them for putting in place energy saving innovations.
<b>Operating Dates</b>	Climate Change Levy (and Negotiated Agreements) were introduced from 1 April 2001.
<b>Eligibility Requirements</b>	Need to be in one of the Negotiated Agreement sectors.
<b>Type, size and number of customers targeted</b>	Large businesses in sector that have negotiated agreements.
<b>Savings</b>	Very significant financial savings of 80% of the Levy that would be paid by large customers.
<b>Role of Market Actors</b>	None
<b>Costs</b>	In order to take advantage of the reduced climate change levy rates companies need to invest in the energy improvements specified in the negotiated agreements.
<b>Benefits to participants</b>	Significant reduced payments of the Climate Change Levy.

<b><i>Take up of the Programme</i></b>	Very extensive as large customers were keen to avoid paying the full rate of the climate change levy.
<b><i>Key Barriers</i></b>	Obtaining agreement for each sector.
<b><i>Marketing Strategies</i></b>	Not really needed as large customers were aware of the Climate Change Levy and were keen to reduce their exposure to this tax.
<b><i>Contact Information</i></b>	DEFRA <a href="http://www.defra.gov.uk/environment/ccl">www.defra.gov.uk/environment/ccl</a>

### 2.1.2 Energy Efficiency Commitment

<b>Programme Name</b>	EEC2: The Energy Efficiency Commitment 2005-2008.
<b>Sponsoring Organisation:</b>	DEFRA (Ofgem administration).
<b>Description of the Programme</b>	<p>All licensed energy suppliers with at least 50,000 gas or electricity customers are subject to an EEC target. This target is set by Ofgem based on the supplier's domestic customers. Each supplier needs to implement energy efficiency measures that will save the energy targets that have been set by Ofgem according to a specified format. Fifty percent of the energy targets will need to be met by energy savings from priority group (low income) customers.</p> <p>Typical measures that are provided by supplies in order to meet their energy savings targets include:</p> <ul style="list-style-type: none"> <li>• Cavity wall insulation;</li> <li>• Loft insulation;</li> <li>• Upgrading boilers from B to A energy ratings (paying the difference);</li> <li>• CFLs;</li> <li>• Upgrading appliances;</li> <li>• Insulating water tank; and</li> <li>• Draughtproofing.</li> </ul>
<b>Purpose</b>	The programme is part of the Government's Climate Change Programme. It contributes to meeting climate targets and assists low income households (priority group).
<b>Operating Dates</b>	This particular programme runs from April 2005 to March 2008. It will be replaced by another similar energy efficiency programme (EEC3) and was a follow up to a successful programme (EEC1). The Energy Efficiency Commitment replaced the Energy Efficiency Standards of Performance that run from 1994-2002.
<b>Eligibility Requirements</b>	Mandatory for all large electricity and gas suppliers.
<b>Type, size and number of customers targeted</b>	Domestic customers – primarily the fuel poor.
<b>Savings</b>	The programme aims to save 130TWh between 2005 and 2008.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Costs will be passed on to all customers. Estimated to cost not more than £9 per customer per annum per fuel.
<b>Benefits to participants</b>	Energy efficiency improvements for no/low cost.
<b>Take up of the Programme</b>	Many millions of domestic customers will take part. Some of the customers may get small benefits (e.g. free light bulbs) for others the benefits could be much more significant such as free cavity wall installation.
<b>Key Barriers</b>	Suppliers need to access enough priority customers to reach their targets.

<b><i>Marketing Strategies</i></b>	Suppliers run their own marketing campaigns.
<b><i>Contact Information</i></b>	Contact individual suppliers for details of the programmes they operate. Often provide details of their programme at <a href="http://www.ofgem.gov.uk">www.ofgem.gov.uk</a>

### 2.1.3 Energy Efficiency Loans

<b>Programme Name</b>	Energy Efficiency Loans from the Carbon Trust (A similar scheme Loan Action Scotland is available in Scotland).
<b>Sponsoring Organisation:</b>	Carbon Trust.
<b>Description of the Programme</b>	Interest free loans of between £5,000 and £100,000 are available to qualifying small and medium sized enterprises that are investing capital in energy savings projects. Up to £200,000 is available in Northern Ireland. These loans are repaid over a period of up to 4 years.
<b>Purpose</b>	The capital needed for energy savings investment is often difficult to obtain, but the benefits can pay back quickly. The purpose of these loans is to reduce this barrier by providing capital on favourable terms.
<b>Operating Dates</b>	2005 onwards.
<b>Eligibility Requirements</b>	SME Customers with less than €50m turnover, less than 250 staff and less than €43m in assets. (EU Definition of SME)
<b>Type, size and number of customers targeted</b>	Small business customers targeted with a total of up to £10m available.  Certain sectors including transport, agriculture ore export sectors are excluded.
<b>Savings</b>	Will depend on the measure being implemented.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Administrative cost of being involved. The business will need to complete an application form with the help of the supplier of the equipment.  The business will need to pay for the energy saving scheme as this is only a loan.
<b>Benefits to participants</b>	Cheap loans.
<b>Take up of the Programme</b>	Not known.
<b>Key Barriers</b>	Loans still need to be paid back and investment has to overcome a minimum hurdle for emissions reduction per £. This is set at the equivalent of 1.43 tonnes carbon dioxide p/a per £1000 of loan value.
<b>Marketing Strategies</b>	TV and on-line advertising campaign in 2005.
<b>Contact Information</b>	Carbon Trust Helpline 0800 0852005 <a href="http://www.thecarbontrust.co.uk/loans">www.thecarbontrust.co.uk/loans</a>

#### 2.1.4 Enhanced Capital Allowances Programme

<b>Programme Name</b>	Enhanced Capital Allowance (ECA) Scheme.
<b>Sponsoring Organisation:</b>	Carbon Trust Administrator but funded from tax revenue (less tax is received).
<b>Description of the Programme</b>	The ECA scheme was set up to encourage businesses to purchase energy saving equipment specified on the Energy Technology List. Business can get enhanced capital allowances of 100% of capital expenditure for expenditure on the 9,000 products on the Energy Technology List. Business can claim the allowance on the costs of the product as well as costs associated with the provision of the product such as installation costs.
<b>Purpose</b>	Encourage businesses to invest in energy efficient investments.
<b>Operating Dates</b>	Enhanced capital allowances were first introduced in the November 1999 Budget, with the scheme properly launched in 2001. The programme has been amended every budget since 2002 to include additional products and amend some criteria. It is an on-going programme.
<b>Eligibility Requirements</b>	A business needs to be investing in energy efficiency equipment from the Energy Technology List. Need to be paying income/corporation tax in order to claim the enhanced capital allowance.
<b>Type, size and number of customers targeted</b>	Business customers.
<b>Savings</b>	Not available – would have encouraged customers to invest in energy efficiency equipment, but some of them may have invested anyway.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Cost to the exchequer as less tax is collected.
<b>Benefits to participants</b>	Reduction in tax bills.
<b>Take up of the Programme</b>	Not available but long life suggests it has been successful.
<b>Key Barriers</b>	Still requires expenditure by businesses.
<b>Marketing Strategies</b>	Information available on-line. Publicity generated in annual budgets.
<b>Contact Information</b>	Carbon Trust helpline 0800 585794 <a href="http://www.eca.gov.uk/etl">www.eca.gov.uk/etl</a>

### 2.1.5 Warm Front

<b>Programme Name</b>	Warm Front.
<b>Sponsoring Organisation:</b>	DEFRA (managed by EAGA Partnership).
<b>Description of the Programme</b>	<p>Warm Front is the Government's main grant funded programme for tackling fuel poverty. A Warm Front grant of up to £2,700 or £4,000 (if oil central heating is recommended) can provide a package of insulation and heating measures for each property including:</p> <p>Insulation Measures:</p> <ul style="list-style-type: none"> <li>• Loft Insulation;</li> <li>• Draught Proofing;</li> <li>• Cavity-wall insulation; and</li> <li>• Hot-water tank insulation</li> </ul> <p>Heating Systems:</p> <ul style="list-style-type: none"> <li>• Central heating;</li> <li>• Gas room heaters;</li> <li>• Electric storage heaters;</li> <li>• Converting a solid fuel open fire to modern glass fronted fire;</li> <li>• Time controls for electric space waters and water heaters; and</li> <li>• Heating repairs and replacements.</li> </ul> <p>Other Measures:</p> <ul style="list-style-type: none"> <li>• Energy advice;</li> <li>• Two low-energy light bulbs; and</li> <li>• Hot water tank jacket.</li> </ul>
<b>Purpose</b>	Assist Fuel Poor households to get adequate heating.
<b>Operating Dates</b>	Started in 2000 (called Home Energy Efficiency Scheme)
<b>Eligibility Requirements</b>	<p>Aimed at two Fuel Poor categories</p> <ul style="list-style-type: none"> <li>• Those with a young child (or pregnant) and in receipt of certain benefits</li> <li>• Those over 60 that are receipt of certain benefits.</li> </ul>
<b>Type, size and number of customers targeted</b>	Fuel poor households of all sizes. In 2004/05 over 207,500 customers were assisted. Up to March 2005 over 1 million households have receive assistance.
<b>Savings</b>	Not known
<b>Role of Market Actors</b>	EAGA act as scheme administrator.
<b>Costs</b>	Not known
<b>Benefits to participants</b>	Grants, advice, CFLs.
<b>Take up of the Programme</b>	High (>1 million customers).

<b>Key Barriers</b>	Average waiting times for new Central heating systems can be 3-6 months.
<b>Marketing Strategies</b>	Advertised on EAGA partnership website. Charities are made aware of the programme and can inform those entitled to the grant.
<b>Contact Information</b>	EAGA Partnership DEFRA

### 2.1.6 Reduced rate of VAT on Energy Saving Materials

<b>Programme Name</b>	Reduced VAT on Energy Saving Materials for installation in residential accommodation.
<b>Sponsoring Organisation</b>	UK Exchequer.
<b>Description of the Programme</b>	<p>The programme allows a reduced rate of VAT of 5% (as against 17.5%) to be charged for energy efficient equipment fitted to existing buildings. This reduced rate applies to</p> <ul style="list-style-type: none"> <li>• Central heating and hot water system controls;</li> <li>• Draught stripping;</li> <li>• Insulation;</li> <li>• Solar Panels;</li> <li>• Wind turbines;</li> <li>• Water turbines;</li> <li>• Air Source Heat Pumps;</li> <li>• Micro-CHP; and</li> <li>• Wood fuelled boilers.</li> </ul> <p>This reduced rate only applies to the supply of installed equipment. If a business supplies reduced rate energy saving materials without installation then the full rate of 17.5% applies.</p>
<b>Purpose</b>	The reduction in VAT should encourage installation of these materials and appliances.
<b>Operating Dates</b>	Has been introduced gradually over the last few years with a wider range of products.
<b>Eligibility Requirements</b>	Need to be installing energy efficient equipment.
<b>Type, size and number of customers targeted</b>	<p>A broad range of customers fit within the definitions of residential accommodation including:</p> <ul style="list-style-type: none"> <li>• Houses, Flats, other dwellings;</li> <li>• Armed forces residential accommodation;</li> <li>• Children’s homes and homes for the elderly;</li> <li>• Hospices;</li> <li>• Schools and universities residential accommodation;</li> <li>• Monasteries, nunneries and religious communities;</li> <li>• Some holiday accommodation; and</li> <li>• Some charity buildings.</li> </ul>
<b>Savings</b>	Not known.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Not known.
<b>Benefits to participants</b>	Grants towards building more energy efficient house.

<b><i>Take up of the Programme</i></b>	Not known but has been extended to a wider sets of technologies which suggests it has been successful.
<b><i>Key Barriers</i></b>	Still the cost of making the investment.
<b><i>Marketing Strategies</i></b>	Budget announcements.  Publicised by the companies that install the equipment as it generators additional business.
<b><i>Contact Information</i></b>	HM Customs and Excise

### 2.1.7 Commit to save your 20%

<b>Programme Name</b>	Commit to save your 20%.
<b>Sponsoring Organisation</b>	Energy Saving Trust.
<b>Description of the Programme</b>	<p>The idea is that customers should commit to saving 20% of their energy as their part towards the UK commitment to save CO<sub>2</sub>. To do this there are a list of possible measures on the Energy Savings Trust website. The website indicates how much (as a percentage) each of the measure will deliver in Carbon saving with the idea that consumers select a suite of measures that will result in them saving 20% of their energy. The savings are based on an average consumer. This list helps customers realise how much CO<sub>2</sub> they can save by making changes to the way they live.</p> <p>Once you commit to your suite of measures the Energy Saving Trust will send you a postcard of a favourite place (from their selection), which can also be sent to a friend. This postcard is a reminder of the place you are helping to protect from climate change by saving your 20%.</p>
<b>Purpose</b>	Encourage consumers to reduce their energy consumption and makes them aware of simple steps they can take to reduce consumption.
<b>Operating Dates</b>	Launched in 2006.
<b>Eligibility Requirements</b>	Open to all household customers.
<b>Type, size and number of customers targeted</b>	All household customers.
<b>Savings</b>	Not known.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Not known but low on a per customer basis.
<b>Benefits to participants</b>	Customers understand how they can save energy. Associate the benefits of saving energy with preserving the environment.
<b>Take up of the Programme</b>	Not known, but believed to be high.
<b>Key Barriers</b>	Making customers aware of the website. Getting customers to maintain their commitment.
<b>Marketing Strategies</b>	<p>Advertised on Energy Saving Trust.</p> <p>Promoted during Energy saving week.</p>
<b>Contact Information</b>	<p>Energy Saving Trust</p> <p><a href="http://www.est.org.uk">www.est.org.uk</a></p>

### 2.1.8 Energy Survey

<b>Programme Name</b>	Energy Survey.
<b>Sponsoring Organisation</b>	Carbon Trust.
<b>Description of the Programme</b>	<p>The Carbon Trust provides a range of energy surveys to businesses with energy bills over £50,000 p/a. These surveys will normally be free but are subject to availability and eligibility.</p> <p>When a company applies for a survey the company will be contacted by a Carbon Trust account manager to discuss the precise needs and requirements of the company. Where appropriate the account manager will raise an order for a consultant to visit your sites for a survey.</p> <p>Each survey will be conducted by an independent accredited consultant and will produce a practical action plan to meet the organisation's requirements. The Survey and action plan will normally take between 2-10 days depending on the size and complexity of the site. The consultant will feed back initial comments to relevant staff straight after the site visit, with a draft Action Plan produced a few weeks later. This will be discussed with the company before finalisation and will typically include:</p> <ul style="list-style-type: none"> <li>• An analysis of the company's energy use including comparisons with similar organisations;</li> <li>• A review of current energy management procedures; and</li> <li>• A list of energy saving opportunities that can be implemented.</li> </ul> <p>After the action plan is produced the account manager will contact the company for feedback. Where appropriate the Carbon Trust will provide follow up support to assist organisations to implement the recommendation in the action plan. This could include:</p> <ul style="list-style-type: none"> <li>• Assistance with senior management briefing;</li> <li>• Staff awareness and technical training;</li> <li>• Implementation and project management advice;</li> <li>• Energy management advice; and</li> <li>• Feasibility studies.</li> </ul> <p>A year after the survey companies will be contacted by the account manager to determine progress with the action plan.</p> <p>Multi-site assessment are available for companies with accumulative energy bill greater than £150,000 p/a.</p>
<b>Purpose</b>	Helps companies save energy and reduce their energy bills.
<b>Operating Dates</b>	Ongoing scheme.
<b>Eligibility Requirements</b>	Business with an energy bill of at least £50,000 p/a.
<b>Type, size and number of customers targeted</b>	All large customers.

<b>Savings</b>	Carbon Trust estimate savings could be between 10-30% of energy bills.
<b>Role of Market Actors</b>	Independent consultants are used to perform the survey.
<b>Costs</b>	Typically the surveys are free. However, some of the additional services such as feasibility studies for specific energy saving opportunities will only be part funded. In addition the company will also bear the costs of any energy saving actions they choose to undertake.
<b>Benefits to participants</b>	Lower energy bills.
<b>Take up of the Programme</b>	Thousands of companies have been involved.
<b>Key Barriers</b>	To gain the benefits suggested in the action plan the company still needs to invest. Getting companies to initiate the surveys.
<b>Marketing Strategies</b>	Advertised on the Carbon Trust website.
<b>Contact Information</b>	Carbon Trust website <a href="http://www.carbontrust.co.uk">www.carbontrust.co.uk</a>

### 2.1.9 Carbon Management

<b>Programme Name</b>	Carbon Management.
<b>Sponsoring Organisation</b>	Carbon Trust.
<b>Description of the Programme</b>	<p>The Carbon Management programme is designed for large organisation who wish to manage and reduce their carbon emissions while growing profitably. The programme aim to provide a strategic view of how carbon impacts the organisation by identifying the risks and opportunities associated with climate change.</p> <p>The programme takes a systematic approach with 5 key steps.</p> <ol style="list-style-type: none"> <li>1) Mobilise the organisation and get buy-in.</li> <li>2) Evaluate the Business case – Companies gain an understanding of climate change and its risks and opportunities for the business.</li> <li>3) Identify Opportunities – establish a detailed picture of company wide emission assets and liabilities. It is focused on generating and evaluating specific ideas for achieving cost effective emission reductions.</li> <li>4) Develop Implementation plans – prioritises opportunities to reflect corporate objectives and liabilities. Outcome is an implementation plan with actionable emissions reduction targets</li> <li>5) Manage Implementation – this monitors progress on the implementation plan and its effectiveness in delivering the specified objectives.</li> </ol> <p>The Carbon Management programme is delivered as a customised service, tailored for the individual company needs. It takes around 6 months with several week of pre-project preparation. A dedicated account manager from the Carbon Trust will work with each company to develop the scope and focus of the work.</p>
<b>Purpose</b>	Reduce the carbon being used by large companies.
<b>Operating Dates</b>	Started with a trial in 2003-04 and is ongoing.
<b>Eligibility Requirements</b>	Large Businesses – One pre-requisite is senior level company support and commitment.
<b>Type, size and number of customers targeted</b>	Large Businesses.
<b>Savings</b>	Pilot projects identified over 5 million tonnes of CO <sub>2</sub> emission reduction opportunities from a range of different sources. Energy efficiency and renewables were two areas of major opportunity.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Costs in implementing some of the recommendations.

<b>Benefits to participants</b>	<p>The Carbon Trust claim that the comprehensive nature of carbon management means that this process could impact positively on all of an organisation's operations, from research &amp; development, procurement and logistics through to cost management, branding and investment, employee or local community relations.</p> <p>In addition going through this process could lead to possibilities offered by renewable energy, waste reduction and the use of recycled raw materials.</p>
<b>Take up of the Programme</b>	Fifty companies in initial trial. Many more now participating.
<b>Key Barriers</b>	Time and funding to implement the opportunities.
<b>Marketing Strategies</b>	Advertised on the Carbon Trust website.
<b>Contact Information</b>	Carbon Trust website <a href="http://www.carbontrust.co.uk">www.carbontrust.co.uk</a>

### 2.1.10 Networks Initiative

<b>Programme Name</b>	Networks Initiative
<b>Sponsoring Organisation</b>	Carbon Trust
<b>Description of the Programme</b>	<p>The aim of the Networks Initiative is to save carbon by commissioning proposals from Networks that demonstrate an ability to deliver carbon savings. The definition of networks includes relationships with and activities based on trade and professional bodies and trade unions. Networks as organisations do not emit much carbon, but they will influence others that do.</p> <p>The Carbon Trust looks to procure services from these Networks through the delivery of projects. A project requires a proposal to be made that will be assessed on its ability to provide a business case as to how carbon saving will be brought about directly or indirectly. As an example a direct saving could be through development of a common specification, whilst an indirect saving could involve influencing others through Continuing Professional Development (CPD) delivery.</p> <p>There are two levels of financial support 'up to £30k' and 'up to £140k'. For both levels of support there will be a requirements for clear metrics linked to the objective of reducing UK Carbon emissions. Matched funding is a requirement for the higher level of funding.</p> <p>There have been a number of rounds of Network Initiative funding with the third round in 2006.</p>
<b>Purpose</b>	Encourages networks to reduce carbon emissions.
<b>Operating Dates</b>	Original call for proposal was made in November 2005. The third call is now underway.
<b>Eligibility Requirements</b>	<p>The following networks are excluded</p> <ul style="list-style-type: none"> <li>• Networks that do not provide representation and services</li> <li>• Networks that focus exclusively on the public sector</li> <li>• Networks that receive &gt;50% of the funding direct from the government or public sources</li> <li>• Commercial entities that operate under a 'profit distributing basis to the shareholders or members.</li> </ul> <p>To be eligible all companies would also need to sign a contract with the Carbon Trust.</p>
<b>Type, size and number of customers targeted</b>	All networks that are not excluded for the reasons listed above.
<b>Savings</b>	Not known.
<b>Role of Market Actors</b>	Networks organisations are a way to get to members who may collectively have high level of emissions.
<b>Costs</b>	First round gave away £717k in funding.

<b>Benefits to participants</b>	Payments for (or towards) the provision of programmes that help their members reduce Carbon .
<b>Take up of the Programme</b>	First round had 12 organisations participate. The second round had 13 organisations participate.
<b>Key Barriers</b>	The larger programmes require matched funds. Both programmes require the network to put together a proposal for an activity (saving carbon) that is not a core part of their business.
<b>Marketing Strategies</b>	Advertised on the Carbon Trust website.
<b>Contact Information</b>	Carbon Trust website <a href="http://www.carbontrust.co.uk">www.carbontrust.co.uk</a>

### 2.1.11 Energy Efficiency Accreditation Scheme

<b>Programme Name</b>	Energy Efficiency Accreditation Scheme
<b>Sponsoring Organisation</b>	Carbon Trust
<b>Description of the Programme</b>	<p>The Energy Efficiency Accreditation Scheme is the UK's only independent award which recognises achievements in reducing energy use by companies in industry, commerce and the public sector. It is now operated by the Carbon Trust, but was originally established by the Energy Systems Trade Association (ESTA) and the Energy Institute.</p> <p>Under this scheme companies are awarded Accreditation by the Energy Institute. To obtain Accreditation organisation need to reach the standards set by the scheme. Evaluations are undertaken by independent, experienced assessors who examine an organisation's performance in 3 main areas:</p> <ol style="list-style-type: none"> <li>1) Management commitment to energy efficiency;</li> <li>2) Investment in energy efficiency measures; and</li> <li>3) Energy efficiency improvement.</li> </ol> <p>An accreditation assessment normally takes 2-3 days after which time documentation is written up. The whole process takes around 1 month. To gain Energy Efficiency Accreditation the organisation must be able to demonstrate three years' continual investment in energy efficiency.</p> <p>As well as being beneficial in its own right, accreditation will also help in gaining exemption from the Climate Change Levy.</p> <p>Accreditation lasts for three year after which time the organisation can apply for re-accreditation.</p>
<b>Purpose</b>	Encourages firm to be energy efficient and enables them to use the energy efficiency logo on promotional material.
<b>Operating Dates</b>	Has been operating in some form since 1993, but has been run by the Carbon Trust since December 2004
<b>Eligibility Requirements</b>	Companies need to be able to demonstrate continual investment in energy efficiency.
<b>Type, size and number of customers targeted</b>	The scheme is open to any organisation from the industrial, commercial or public sectors with one or more site. Either entire organisations, separately identifiable units or a single premise can be accredited. All sizes of business can be accredited.
<b>Savings</b>	Typical saving from the process of accreditation is estimated at 3% of fuel bills.
<b>Role of Market Actors</b>	Independent assessors are needed to check whether the firm meets the requirements for Accreditation.
<b>Costs</b>	Organisations need to pay for Accreditation. This varies between £1,500 and £4,900 depending on the size of the organisation.
	Other events such as an annual award ceremony are free and covered by sponsorship.

<b>Benefits to participants</b>	<p>The Carbon Trust list the following benefits for participants on its website:</p> <ul style="list-style-type: none"> <li>• A nationally recognised award for energy efficiency;</li> <li>• A means of demonstrating environmental achievement to the public, customers, and shareholders;</li> <li>• An independent check on energy management systems and practices;</li> <li>• Guidance from independent assessors on improving energy performance;</li> <li>• Recognition of good management disciplines;</li> <li>• Prima facie evidence of meeting the qualitative requirements under Climate Change Agreements;</li> <li>• A way of reducing costs - energy efficiency means lower fuel bills (typically the process results in 3% saving on fuel bills); and</li> <li>• Membership of the Accredited Organisations Network, a forum for the exchange of information and for discussion of matters of common interest.</li> </ul>
<b>Take up of the Programme</b>	Over 200 companies have already got Accreditation and many others are in the process of obtaining Accreditation.
<b>Key Barriers</b>	The companies need to be making the energy efficiency improvements in order to gain accreditation. Needs to be prepared to make the investment.
<b>Marketing Strategies</b>	Advertised on the Carbon Trust website.
<b>Contact Information</b>	Carbon Trust website <a href="http://www.carbontrust.co.uk">www.carbontrust.co.uk</a>

## 2.2 Peak Demand Reduction Programmes

### 2.2.1 Balancing Mechanism

<b>Programme Name</b>	Participation in the Balancing Mechanism.
<b>Sponsoring Organisation</b>	National Grid Transco (NGT) and the Supplier of the customer.
<b>Description of the Programme</b>	NETA was intended to be a 2 sided market with NGT balancing the system using bids and offers from both the generation and the demand side of the market.  Suppliers submit offers for the demand BMU to reduce their load. If NGT accept these offers then the customers need to make this reduction or else be out of balance.
<b>Purpose</b>	NGT can utilise the demand side of the market to help keep the system in balance.
<b>Operating Dates</b>	In operation since NETA went live in March 2001.
<b>Eligibility Requirements</b>	Normally participants will have a Half Hour (HH) Meter and ability to turn down demand. Needs a Supplier to bid into the BM on the customers' behalf.
<b>Type, size and number of customers targeted</b>	Only a few very large customers have participated in the BM.
<b>Savings</b>	Focused on load shifting rather than load saving.
<b>Role of Market Actors</b>	Require supplier to submit bids/offer on behalf of the customer.
<b>Costs</b>	NGT will accept the cheapest bids/offers. The involvement of the demand side represents increased competition so there should be a saving to the industry.
<b>Benefits to participants</b>	Additional source of revenue.
<b>Take up of the Programme</b>	Very few active participants.
<b>Key Barriers</b>	<ul style="list-style-type: none"> <li>• Only licensed suppliers can participate in the BM. This activity therefore requires agreement from the supplier to place bids/offer.</li> <li>• Risk of potentially high imbalance payments if they failed to deliver.</li> <li>• Participants cannot receive balancing services availability payments and participate in the balancing mechanism.</li> </ul> <p>The requirement to segregate demand side participants in separate BMUs in order to provide sufficient resolution to confirm demand reduction was actually achieved.</p>
<b>Marketing Strategies</b>	Large Customers are aware of the opportunity to participate in the balancing mechanism through groups such as the Major Energy Users Council.
<b>Contact information</b>	<a href="http://www.elexon.co.uk">www.elexon.co.uk</a> <a href="http://www.ofgem.gov.uk">www.ofgem.gov.uk</a>



### 2.2.2 Demand Turndown

<b>Programme Name</b>	Demand Turndown Pilot Scheme.
<b>Sponsoring Organisation:</b>	National Grid Transco.
<b>Description of the Programme</b>	<p>This scheme was aimed at large demand customers, aggregators and/or small generators. Participants have to offer to turn down demand for a minimum of 2 hour periods.</p> <p>The winter scheme had a single 2 hour fixed window of availability from 9:00 to 11:00 and an optional window/zone at either side of this fixed window. The summer trial had 2 turndown periods from 09:30 to 11:30 and from 11:30 to 13:30. The change in the size of the windows from the summer to winter reflects feedback from participants.</p>
<b>Purpose</b>	<p>The scheme was designed to give the demand side a better opportunity to provide balancing services.</p> <p>.</p>
<b>Operating Dates</b>	<p>Trial ran from the end of November 2004 to end of March 2005.</p> <p>The first trial was run from 5 April to 30 July 2004.</p>
<b>Eligibility Requirements</b>	<p>Each participant needs to provide:</p> <ul style="list-style-type: none"> <li>• 100MW of turndown capacity (this has been relaxed so far);</li> <li>• Sustainable for up to 2 hours;</li> <li>• Single contracting counterparty and point of dispatch; and</li> <li>• Identified demand sites.</li> </ul> <p>Participating demand sites cannot participate in other services at the same time (i.e. need to avoid double payments).</p>
<b>Type, size and number of customers targeted</b>	<p>Large customers with HH metering (preferably minute by minute).</p> <p>Potentially small generators.</p>
<b>Savings</b>	Focused on load shifting rather than load saving
<b>Role of Market Actors</b>	Aggregators are needed to combine demand from demand sites and potentially generators.
<b>Costs</b>	<p>The report on the first trial of the pilot scheme has the preliminary settlement figures giving a total spend of £140k. This breaks down into:</p> <ul style="list-style-type: none"> <li>• Availability Payments - £36k;</li> <li>• Standby Payments - £30k; and</li> <li>• Utilisation Payments - £74k.</li> </ul>
<b>Benefits to participants</b>	Payments from NGT.

<b>Take up of the Programme</b>	<p>Disappointing for the first trial. Pilot scheme had 2 aggregators (Gaz de France and Npower) and involved seven site operators.</p> <p>The average daily availability was the 66 MW for the first 2 hour period and 48MW for the second period with maximum availability achieved of 87.6MW and 75.5MW in the respective periods.</p>
<b>Key Barriers</b>	<ul style="list-style-type: none"> <li>• Supply contract negotiations that coincided with the Demand Turndown trial periods;</li> <li>• Providers reluctant to provide a new service; and</li> <li>• Operational drivers outweighed the gains from payments for this service.</li> </ul>
<b>Marketing Strategies</b>	<p>Promoted at Ofgem’s Demand Side Working Group and NGT’s Operational Forum.</p>
<b>Contact information</b>	<p><a href="http://www.nationalgrid.com">www.nationalgrid.com</a>  <a href="http://www.ofgem.gov.uk">www.ofgem.gov.uk</a></p>

### 2.2.3 Distribution Network Avoidance (Anglesey)

<b>Programme Name</b>	Distribution Network Avoidance at Anglesey
<b>Sponsoring Organisation:</b>	MANWEB
<b>Description of the Programme</b>	<p>This is an old programme that was seen as an innovative option when introduced and has been reviewed for a number of case studies. The scheme had a number of different methods designed to reduce peak demand on the island. This includes:</p> <p><b>Households</b></p> <ul style="list-style-type: none"> <li>• Offer of 2 energy efficient light bulbs per household;</li> <li>• Offer of cheap loft insulation and draught proofing;</li> <li>• Free water tank insulation; and</li> <li>• Rebates on energy efficient appliances.</li> </ul> <p><b>Small Business Sector</b></p> <ul style="list-style-type: none"> <li>• Offer of 2 energy efficient light bulbs;</li> <li>• Free water tank insulation; and</li> <li>• A free lighting audit.</li> </ul> <p><b>Large Business Sector</b></p> <ul style="list-style-type: none"> <li>• Free energy audit;</li> <li>• Subsidies on energy saving measures; and</li> <li>• Subsidies on power factor correction equipment.</li> </ul>
<b>Purpose</b>	Avoid or defer investment in a new transformer at Holy Island
<b>Operating Dates</b>	Programme started in 1993 and ran for approximately one year.
<b>Eligibility Requirements</b>	<p>Most electricity customers were eligible for the programme and there were no special metering requirement.</p> <p>Customers needed to be electrically heated to be eligible for some of the insulation.</p>
<b>Type, size and number of customers targeted</b>	The programme targeted both residential and business customers including industrial and commercial customers.
<b>Saving</b>	Focused on load shifting rather than load saving.
<b>Role of Market Actors</b>	National Energy Action was responsible for draught proofing and insulation Prince's Trust was used for distributing the light bulbs.
<b>Costs of the scheme</b>	£250k.
<b>Benefits to participants</b>	Cheap mechanism for customers to save electricity. Free advice and discounted appliances. Manweb were able to defer network investment.

<b>Take up of the Programme</b>	<p>Good participation rate achieved – Energy Savings Trust reported following take up:</p> <ul style="list-style-type: none"> <li>• Residential customers had penetration rates of 79% for light bulbs, water cylinder insulation of 84%, but lower rates for draught proofing 20% and insulation 30%.</li> <li>• Small business market penetration rates were 24% light bulbs, 17% water cylinders, 6% lighting refurbishment.</li> <li>• Industrial customers who were involved saved significant amounts of energy. 60% of the peak demand was saved by just 4 sites.</li> </ul>
<b>Key Barriers</b>	<p>Persuading customers of the benefits of these demand side initiatives. To overcome this a dedicated mobile unit and a Manweb shop were used for sales and marketing of the programme.</p>
<b>Marketing Strategies</b>	<p>Mainly by direct mail, but also local radio, TV, press and local schools. Also the mobile unit applied above.</p>
<b>Contact information</b>	<p>Programme is now many years old. Information taken from</p> <p>Aine Kelly and Simon Marvin 'Demand Side Management: The Electricity Sector and Town Planning' Schol of Architecture, Planning &amp; Landscape, University of Newcastle upon Tyne.</p> <p>Energy Savings Trust 'Energy Efficiency and Jobs: UK Issues and Case Studies' A report by the Association for the Conservation of Energy to the Energy Savings Trust, Sept 2000.</p>

## 2.2.4 Fast Reserve

<b>Programme Name</b>	Fast Reserve.
<b>Sponsoring Organisation:</b>	National Grid Transco.
<b>Description of the Programmes</b>	<p>This scheme is aimed at both generation and supply.</p> <p>It requires rapid reduction in consumption after receipt of an electronic dispatch instruction from NGT. This power delivery needs to start within 2 minutes of instruction, deliver in excess of 25MW/minute and be sustainable for a minimum of 15 minutes.</p> <p>It is proven scheme for very large customers who have their processes controlled by direct circuit breakers.</p> <p>There was a trial in 2002/03 for small customers. One element was around short term interruptions and was based on water/space heating control by radio teleswitch/Cyclocontrol. These small customers could only provide fast reserve during off peak periods. It is also mainly applicable during the winter periods as it is based on the heating load. Trial was for 300MW from RTS customers and 50MW by Cyclocontrol.</p> <p>An additional element of the small customer trial was off-peak demand profiling using 600MW of teleswitch demand. This involved the off peak switching being staggered to smooth any rapid demand changes that would occur if all switching occurred at the same time.</p>
<b>Purpose</b>	Fast Reserve is required by NGT to help keep the system in balance.
<b>Operating Dates</b>	<p>All year round.</p> <p>Small customers were trialled in 2002/03.</p>
<b>Eligibility Requirements</b>	<p>NGT list the follow eligibility criteria for Fast Reserve:</p> <ul style="list-style-type: none"> <li>• Capability to start Fast Reserve delivery within 2 minutes of instruction</li> <li>• Delivery rate of Fast Reserve &gt; 25MW / minute</li> <li>• Capability to sustain output for &gt; 15 minutes</li> <li>• Capability to halt or start to unwind Fast Reserve delivery within 2 minutes of instruction</li> <li>• Unwind rate of Fast Reserve &gt; 25MW / minute</li> <li>• Minimum single instructable block size of 50MW or aggregation of more than one unit to create an aggregated unit with a size of 70MW</li> <li>• Electronic despatch</li> <li>• Measurable &amp; Demonstrable Fast Reserve delivery</li> </ul> <p>Limitations of utilisation of Fast Reserve.</p>
<b>Type, size and number of customers targeted</b>	<p>Very large customers that meet the requirements.</p> <p>Large groups of small customers for the trial.</p>
<b>Savings</b>	Focused on load shifting not load saving.
<b>Role of Market Actors</b>	Potential role for aggregators.

<b>Costs of the scheme</b>	Non Tendered Fast Reserve contracted on a bilateral basis from Service providers was worth £2.7m in availability payments in June 2005.
<b>Benefits to participants</b>	Payments from NGT.
<b>Take up of the Programme</b>	Fast Reserve mainly provided by generators rather than demand side.
<b>Key Barriers</b>	Technical qualification criteria are onerous and restrict demand side involvement. Most Fast Reserve provided by a small number of generating units.
<b>Marketing</b>	NGT's Operational Forum and the Demand Side Working Group.
<b>Contact information</b>	<a href="http://www.nationalgrid.com">www.nationalgrid.com</a> <a href="http://www.ofgem.gov.uk">www.ofgem.gov.uk</a>

## 2.2.5 Frequency Response

<b>Programme Name</b>	Frequency Response.
<b>Sponsoring Organisation:</b>	National Grid Transco.
<b>Description of the Programme</b>	<p>Suppliers can compete with generators to provide the non mandatory frequency response services. These services can either be firm or optional. The firm contracts mean that you have to shed load when required by NGT, the optional contracts give the participant some discretion on whether the service is provided.</p> <p>Customers who provide these services have to be prepared for their demand to be interrupted for up to 30 minutes several times a week. However, in practice the sites are interrupted between 10 and 30 times a year. (There is also only partial site interruption).</p> <p>These demand services can be initiated automatically from large customers using low frequency relays, which automatically shed load for pre-determined low frequency events.</p> <p>Suppliers are rewarded based on Holding (availability) and Response Energy Payments (not necessarily the supplier – NGT may pay the demand side provider directly or an aggregator). With optional contracts the holding payments are restricted to when the provider makes the service available.</p>
<b>Purpose</b>	NGT need to maintain frequency at 50 Hz and will endeavor to find the most cost effective way to achieve this. Utilising the demand side helps in broadening the potential market and reduces the need to use the more expensive mandatory service that generators provide. The LF relay approach is designed to alleviate frequency problems at times of high system stress, not a normal network condition.
<b>Operating Dates</b>	All year round. Has been utilised for many years.
<b>Eligibility Requirements</b>	Large customers with HH meters.
<b>Type, size and number of customers targeted</b>	The participants that normally provide these services are large flexible industrial load that can meet the changing demand requirements. Recently some aggregators such as Gas de France have been facilitating smaller sites being involved.
<b>Savings</b>	Focused on load shifting rather than load saving.
<b>Role of Market Actors</b>	Aggregators have started to play a role in this service.
<b>Costs</b>	In June 2005 £1.8m was spent on Mandatory frequency response and £1.5m was spent on Commercial frequency response.
<b>Benefits to participants</b>	Payments from NGT.
<b>Take up of the Programme</b>	In 2002 there was an estimate of at least 10 demand side providers of this service. NGT stated that these volumes have been steadily growing.

<b><i>Key Barriers</i></b>	Being prepared to be interrupted by NGT. Size required to be useful to NGT and the sole agent requirement HH Metering requirements.
<b><i>Marketing Strategies</i></b>	NGT have information on their website. Large users should be aware of the potential for these services through their lobbying groups such as Energy Intensive Users Group.
<b><i>Contact Information</i></b>	<a href="http://www.nationalgrid.com">www.nationalgrid.com</a> <a href="http://www.ofgem.gov.uk">www.ofgem.gov.uk</a>

## 2.2.6 Night Team Economy Seven

<b>Programme Name</b>	Economy 7 (different versions exist).
<b>Sponsoring Organisation:</b>	Suppliers.
<b>Description of the Programmes</b>	<p>Customers have two rate meters that record their usage separately at night and during the day. Electricity used during the night is cheaper than during the day encouraging customers to use more electricity at off peak times. Typically off-peak is for seven hours between such as 00:30 to 07:30.</p> <p>The largest part of this load may be electric heating which would be set to come on during the night. Some customers will have separate circuits for this load, but otherwise they will need to set the heating to come on when the Economy Seven tariffs are in operation. The customer may also set appliances such as washing machines/dishwashers to come on during the night. These appliances would typically be done during using a timer. Not all houses with Economy Seven meters have electric heating.</p> <p>Some customers will have teleswitch meters which will have an electrical circuit or tariff that is switched by radio circuit (e.g. off peak storage heating load). Suppliers are able to control the switching time of meters by the use of group codes. Either the supplier can sponsor its own group codes or can utilise existing codes provided by other supply companies. National radio signals (radio 4) are used to transmit the switching times of these restricted times and the times for reduced tariffs.</p> <p>For customer without teleswitch meters, the seven hours of night time load are pre-set and will require a change on the meter to alter the time at which this happens. This tends to be expensive (as a meter operator will need to visit the premises) and so the times are rarely changed.</p>
<b>Purpose</b>	<p>Balances load out more evenly across the day. Allows suppliers to purchase cheaper night time power and stop distribution companies needing to reinforce the network.</p> <p>For teleswitched meters this provides controllability of load which allows distribution businesses to avoid too much peak demand on the network. This functionality also allows suppliers to purchase energy at cheaper prices and moves load around to match energy purchases.</p>
<b>Operating Dates</b>	All year round.
<b>Eligibility Requirements</b>	<p>Two rate meter.</p> <p>Teleswitch customers need to have a meter with a radio teleswitch and preferably a separate electrical circuit that can be switched.</p>
<b>Type, size and number of customers targeted</b>	Domestic and small business customers. Many millions.
<b>Savings</b>	Focused on peak demand reduction rather than load saving.

<b>Role of Market Actors</b>	<p>Meter operators need to ensure meters are set to record cheap rate electricity at the right time.</p> <p>Teleswitch Agent needed to control switching times.</p>
<b>Costs</b>	<p>Two rate meters and radio teleswitches are slightly more expensive than standard meters.</p> <p>Additional costs if meters need to be visited to change the time regime at which they are set.</p> <p>Need to pay for the teleswitch signals being sent out.</p>
<b>Benefits to participants</b>	<p>Get cheaper night time electricity (day time electricity is normally more expensive).</p>
<b>Take up of the Programme</b>	<p>High, particularly in certain locations. Many newly built house in the 1980s had electric heating that come on at night and consequently they had two rate meters and benefit from economy seven tariffs.</p> <p>Higher penetrations in areas without mains gas supplies, i.e. more customers reliant on electric space/water heating. This provides much greater demand response.</p>
<b>Key Barriers</b>	<p>A key barrier to expansion has been the dramatic rise of gas central heating rather than electric. This has replaced some of the existing electric heaters that used to operate on economy 7.</p> <p>The fact that heating is not on a separate circuit may make it harder to dynamically switch this heating.</p> <p>Cost of setting up codes for teleswitching.</p> <p>Market competition – Competing suppliers do not know exact switching times, thus complicating demand forecasting and increasing non-incumbent balancing market exposures.</p>
<b>Marketing Strategies</b>	<p>Campaigns used to be run by the PESs to encourage electric heating. Most suppliers also have an economy seven type tariff to reward customers that use nighttime electricity.</p> <p>Limited marketing of teleswitching functionality. (Seen as too complicated with little initial investment and no guarantee that customers will remain loyal).</p>
<b>Contact Information</b>	<p>Supplier websites.</p> <p>Radio Teleswitch Sub Group Meeting (Available from Ofgem)</p>

### 2.2.7 Standing Reserve

<b>Programme Name</b>	Standing Reserve.
<b>Sponsoring Organisation:</b>	National Grid Transco.
<b>Description of the Programme</b>	<p>Standing reserve is sourced from participants capable of synchronizing and providing the TSO's required level of output for at least 20 minutes. Demand side participants can provide this reserve by offering to reduce load when requested by NGT.</p> <p>There is an annual competitive auction for standing reserve. This auction splits the year into five seasons, into working days and non working days and the periods into which the Standing Reserve is needed. These periods are referred to as availability periods. Participants bid (availability and utilisation) to provide standing reserve during these periods.</p>
<b>Purpose</b>	During parts of the day NGT will require extra power to deal with actual demand being higher than expected or generation not meeting the expected level. Some of this requirement is met by contracting for standing reserve of which demand reduction is a part.
<b>Operating Dates</b>	Scheme is utilised all year round.
<b>Eligibility Requirements</b>	<p>Providers of standing reserve need to be able to meet the following criteria:</p> <ul style="list-style-type: none"> <li>• Reduce demand by at least 3MW (this can be from a set of sites but needs a minimum aggregate of 3MW);</li> <li>• Response time to demand reduction of 20 minutes or less;</li> <li>• Provide reserve for at least 2 hours;</li> <li>• Recovery time of no more than 20 hours; and</li> <li>• Provide standing reserve at least 3 times a week.</li> </ul>
<b>Type, size and number of customers targeted</b>	Large HH Customers.
<b>Savings</b>	Focused on load shifting rather than load saving.
<b>Role of Market Actors</b>	None.
<b>Costs of the scheme</b>	In the latest month June 2005 £3.4m was spent on Standing Reserve availability payments.
<b>Benefits to participants</b>	Participants get paid. The amount will depend on whether the demand site is also a participant in the BM. Stand by generators get paid to test their plant. Characterized by low availability payments and high utilisation.
<b>Take up of the Programme</b>	Not known.
<b>Key Barriers</b>	Infrastructure requirements. Steady increase in small-scale distribution connected customer participation although predominantly provided from DG.
<b>Marketing Strategies</b>	Major users are aware of the schemes.

**Contact  
Information**

[http://www.nationalgridinfo.co.uk/balancing/pdfs/Standing\\_Reserve\\_Market\\_Report\\_2004-2005.pdf](http://www.nationalgridinfo.co.uk/balancing/pdfs/Standing_Reserve_Market_Report_2004-2005.pdf)  
[www.ofgem.gov.uk](http://www.ofgem.gov.uk)

## 2.2.8 Triad Avoidance

<b>Programme Name</b>	Triad Avoidance – Different suppliers have slightly different schemes for load shedding all based around minimizing peak demand.
<b>Sponsoring Organisation:</b>	National Grid (Indirectly).
<b>Description of the Programme</b>	<p>National Grid charge HH customers (through their supplier) for TNUoS based on electricity usage during the Triad. The Triad is the three settlement periods of highest transmission system demand. These three settlement periods needs to be separated from each other by at least 10 clear days from November to February of the Financial Year.</p> <p>Suppliers offer load management services that will predict a number of occasions when the triad is likely to occur. The Supplier will notify the customer who will have the option of reducing demand.</p> <p>Contracts expose the customer and the supplier to variable TNUoS charge risk. How this risk is shared varies between supplier offerings. Typically, customers are incentivised to reduce demand during triad avoidance periods for significant reductions in TNUoS charge.</p>
<b>Purpose</b>	One of the key drivers of transmission investment is the level of peak demand. This scheme will facilitate customers reducing their peak demand leading to lower TNUoS charges.
<b>Operating Dates</b>	1990 onwards.
<b>Eligibility Requirements</b>	Need HH metering.
<b>Type, size and number of customers targeted</b>	The need for HH metering means that it will be large customer. However, there are over 70,000 HH meters installed so this is a fairly large potential customer base.
<b>Savings</b>	Focused on load shifting rather than load saving.
<b>Role of Market Actors</b>	Suppliers are needed to offer these load management services as part of their product offerings.
<b>Costs</b>	The costs could be seen as more of an opportunity costs in terms of an alternative mechanism for dividing up the costs of Transmission User of System.
<b>Benefits to participants</b>	Lower Transmission Use of System charges.
<b>Take up of the Programme</b>	<p>A well utilised scheme, particularly among larger customers. There was some discussion in 2002 about discontinuing the scheme, but there was a lot of support for the current arrangements. Historically the result has been to reduce the system peak by up to 1700 MW. In 2001/02 NGT put this as 800MW was occurring although other respondents put the figure at up to 1,500 MW.</p> <p>An interesting feature of such schemes is that customer response to triad avoidance instructions is such that the timing of each Triad can be influenced, i.e. load management reduces and moves the timing of peak demand (thereby making Triad forecasting more challenging).</p>

<p><b>Key Barriers</b></p>	<ul style="list-style-type: none"> <li>• HH Meter</li> <li>• Desire to be interrupted (reduce load) when requested by the suppliers who are guessing the triad periods</li> </ul> <p>A mandatory HH metering programme for large customer in the run up to full retail competition has increased the number of customer that have the appropriate metering.</p>
<p><b>Marketing Strategies</b></p>	<ul style="list-style-type: none"> <li>• Suppliers contact customers and offer innovative (lower) tariffs that require customers to agree to be interrupted a number of times based on when Suppliers believe the triad will occur.</li> </ul>
<p><b>Contact Information</b></p>	<p><a href="http://www.nationalgrid.com">www.nationalgrid.com</a>  <a href="http://www.ofgem.gov.uk">www.ofgem.gov.uk</a>  Suppliers will have detail of the schemes they operate to promote load reduction at expected Triads.</p>

### 3. Canadian Demand Management Programs

The current DSM programs in Canada have been split according to whether their primary benefits are likely to be energy efficiency or peak load reductions.

<b>Energy Efficiency Programmes</b>	<b>Peak Demand Reduction Programmes</b>
Power Smart at Home (BC Hydro)	It's Up 2 You (Ontario Conservation Bureau)
Power Smart for Business (BC Hydro)	Demand Response Programme (Ontario Conservation Bureau)
Cool Savings Rebate (Ontario Conservation Bureau)	
Every Kilowatt Counts (Ontario Conservation Bureau)	
Low-income Conservation and Demand Management Programme (Ontario Conservation Bureau)	
Residential Energy Efficiency Programme (OEE)	
Canadian Industry Programme for Energy Conservation (OEE, industry associations)	

### 3.1 Energy Efficiency Programmes

#### 3.1.1 Power Smart at Home

<b>Programme Name</b>	Power Smart at Home
<b>Sponsoring Organisation</b>	BC Hydro
<b>Description of the Programme</b>	<p>Power Smart offers a variety of financial incentives, technical assistance, and guidance to encourage energy efficiency at home. BC Hydro expects Power Smart programmes to offset more than a third of its new customer demand. Programme measures include:</p> <ul style="list-style-type: none"> <li>• <u>Refrigerator buyback</u> – BC Hydro picks up, recycles, and pays small incentive fees to owners of old, inefficient refrigerators.</li> <li>• <u>Lighting rebate</u> – BC Hydro offers rebates for Energy STAR-certified light fixtures, lamps, and CFLs.</li> <li>• <u>Windows rebate</u> – BC Hydro offers a per-square-foot rebate for the purchase of Energy-STAR-labeled windows.</li> <li>• <u>Power Smart Homes</u> – This programme encourages developers to incorporate energy-efficient design concepts and products during construction, which is generally more cost-effective than retrofitting existing homes.</li> <li>• <u>Tips, Products, and Energy Analysis Software</u> – BC Hydro offers tips and product recommendations for all types of energy-consuming products commonly used in the home (lighting, appliances, water heating, HVAC, and building structure). The utility also provides free online software that analyses a home’s energy consumption and provides personalised information and advice on potential cost-saving upgrades.</li> </ul>
<b>Purpose</b>	To encourage the adoption of energy-efficient products in the home.
<b>Operating Dates</b>	1989-present.
<b>Eligibility Requirements</b>	BC Hydro ratepayers.
<b>Type, size and number of customers targeted</b>	All residents in BC Hydro service territory.
<b>Savings</b>	Since 1989 Power Smart has saved consumers over \$1.8 billion. Each year over 4,000 GWh of electricity is saved through Power Smart programs. (These figures include both business and homes programmes.)
<b>Role of Market Actors</b>	Not known.
<b>Costs</b>	Power Smart cost about \$81 per year per customer over the past two years (business and homes combined).
<b>Benefits to participants</b>	Electricity cost savings, system reliability, indoor air quality.
<b>Take up of the Programme</b>	Not known.

<b><i>Key Barriers</i></b>	Cost; getting information to consumers; implementation in existing homes.
<b><i>Marketing Strategies</i></b>	Website, attending industry events (energy, home/interior design, etc.), temporary rebate offers.
<b><i>Contact Information</i></b>	BC Hydro.
<b><i>Website</i></b>	<a href="http://www.bchydro.com/powersmart">www.bchydro.com/powersmart</a>

### 3.1.2 Power Smart for Business

<b>Programme Name</b>	Power Smart for Business.
<b>Sponsoring Organisation</b>	BC Hydro.
<b>Description of the Programme</b>	<p>Power Smart offers a variety of financial incentives, technical assistance, and guidance to encourage businesses to adopt energy efficiency measures, including:</p> <ul style="list-style-type: none"> <li>• <u>Product Incentive Programme</u> – Businesses can apply for incentives to make qualifying equipment upgrades.</li> <li>• <u>High-Performance Building Construction</u> – New commercial buildings of 6,000 to 50,000 square feet receive incentives for lighting designs that meet or exceed international standards and subsequent incentives for installation. Larger buildings receive technical assistance to identify and evaluate energy-efficient design strategies, as well as funds to offset any incremental cost increases to implement these design features.</li> <li>• <u>Compressed Air Initiative and Refrigeration Initiative</u> – For industrial entities with compressed air or large-scale refrigeration systems, Power Smart provides assessments, cost-matching/ incentives for in-depth upgrade studies and implementation measures, system monitoring, and related training and education.</li> <li>• <u>Tips &amp; Practices Guidance</u> – BC Hydro office businesses buying guides, O&amp;M guides, building-specific energy cost saving fact sheets, and other advice.</li> <li>• <u>Partner Programme</u> – Eligible organisations can become Power Smart Partners, gaining access to a variety of energy efficiency tools.</li> </ul>
<b>Purpose</b>	To encourage the adoption of energy-efficient business practices.
<b>Operating Dates</b>	1989-present.
<b>Eligibility Requirements</b>	<p>Commercial buildings include: offices, retail and mixed use low-rise buildings, restaurants, warehouses, schools, long-term healthcare and other government facilities.</p> <p>Qualifying large commercial buildings are electricity-intense facilities such as arenas, refrigerated warehouses, or grocery stores.</p>
<b>Type, size and number of customers targeted</b>	All BC Hydro business customers.
<b>Savings</b>	Since 1989 Power Smart has saved consumers over \$1.8 billion. Each year over 4,000 GWh of electricity is saved through Power Smart programs. (These figures include both business and homes programs.)
<b>Role of Market Actors</b>	Not known.
<b>Costs</b>	Power Smart cost about \$81 per customer per year over the past two years (business and homes combined).
<b>Benefits to participants</b>	Electricity cost savings, system reliability, improved building and air quality, good P.R.
<b>Take up of the Programme</b>	Not known.
<b>Key Barriers</b>	Cost; getting information to consumers; implementation in existing homes.

<b>Marketing Strategies</b>	Website, industry events.
<b>Contact Information</b>	BC Hydro.
<b>Website</b>	<a href="http://www.bchydro.com/business">www.bchydro.com/business</a>

### 3.1.3 Cool Savings Rebate

<b>Programme Name</b>	Cool Savings Rebate.
<b>Sponsoring Organisation</b>	Ontario Conservation Bureau.
<b>Description of the Programme</b>	The <a href="#">Cool Savings Rebate</a> programme encourages Ontario residents with existing central air conditioning systems to improve the operating efficiency of their AC systems by providing rebates of: <ul style="list-style-type: none"> <li>• \$50 for central AC system 'tune-ups';</li> <li>• \$75 towards the purchase and installation of programmable thermostats; and</li> <li>• \$500 to replace existing AC systems with ENERGY STAR® qualified-systems (i.e. 14 SEER or higher).</li> </ul>
<b>Purpose</b>	Improve efficiency of residential air conditioning systems.
<b>Operating Dates</b>	April – August 2006.
<b>Eligibility Requirements</b>	Ontario residents who do not have annual AC maintenance plan.
<b>Type, size and number of customers targeted</b>	Residential.
<b>Savings</b>	Not known.
<b>Role of Market Actors</b>	Replace air conditioning systems.
<b>Costs</b>	The Conservation Fund has an annual budget of \$1.5 million.
<b>Benefits to participants</b>	Improved AC performance; no need for premature replacement; electricity cost savings.
<b>Take up of the Programme</b>	Not known.
<b>Key Barriers</b>	Not known.
<b>Marketing Strategies</b>	Mailing rebates to ratepayers; involve registered contractors in program; website.
<b>Contact Information</b>	866-670-2665, or see website
<b>Website</b>	<a href="http://www.coolsavingsrebate.ca">www.coolsavingsrebate.ca</a>

### 3.1.4 Every Kilowatt Counts

<b>Programme Name</b>	Every Kilowatt Counts.
<b>Sponsoring Organisation</b>	Ontario Conservation Bureau.
<b>Description of the Programme</b>	<p>The programme has sent a booklet of energy saving tips and money saving instant rebate coupons to every one of Ontario's 4.6 million residences. Rebates include:</p> <ul style="list-style-type: none"> <li>• \$3 for ENERGY STAR® qualified CFLs;</li> <li>• \$15 for programmable thermostats;</li> <li>• \$15 for programmable baseboard heater thermostats;</li> <li>• \$7 for motion sensors switches;</li> <li>• \$3 for dimmer switches; and</li> <li>• \$5 for Seasonal LEDS (strings of 50 or more)</li> </ul> <p>The programme will attempt to build on the success of last autumn's seasonal rebate offer.</p>
<b>Purpose</b>	Provide residents with conservation tips and financial incentives to save electricity.
<b>Operating Dates</b>	Begins Oct 1 – Nov 30, 2006.
<b>Eligibility Requirements</b>	Ontario residential ratepayers.
<b>Type, size and number of customers targeted</b>	4.6 million residential customers (households).
<b>Savings</b>	80,000 MWh annually (enough energy to power 7,000 homes). Those who take advantage of the entire coupon package can save up to 10% on their winter electricity bills.
<b>Role of Market Actors</b>	31 retailers at over 3,000 stores are offering qualified devices, up from 23 retailers last year at 2,300 stores. 80 electricity distributors are helping the Conservation Bureau to promote the programme.
<b>Costs</b>	Rebate costs, programme administration. The Conservation Fund has an annual budget of \$1.5 million. Funding allocation will generally be limited to a range from \$10,000 to \$250,000 per project.
<b>Benefits to participants</b>	Energy savings, equipment upgrade savings.
<b>Take up of the Programme</b>	Nearly 250,000 Ontarians participated in the spring Every Kilowatt Counts campaign launched last April.
<b>Key Barriers</b>	Not known.
<b>Marketing Strategies</b>	Rebates only offered for two months a year; provide information along with rebate coupons.
<b>Contact Information</b>	<a href="mailto:conservationfund@powerauthority.on.ca">conservationfund@powerauthority.on.ca</a> ; 1-866-859-9898.
<b>Website</b>	<a href="http://www.everykilowattcounts.ca">www.everykilowattcounts.ca</a>



### 3.1.5 Low-income Conservation and Demand Management Program

<b>Programme Name</b>	Low-income Conservation and Demand Management Programme.
<b>Sponsoring Organisation</b>	Ontario Conservation Bureau.
<b>Description of the Programme</b>	<p>The programme has two overriding objectives:</p> <ul style="list-style-type: none"> <li>• To capture potential energy savings in Ontario's housing sector through lighting and appliance upgrades, building improvements, and consumer education aimed at promoting energy conservation, while at the same time ensuring that the broad energy needs of households in this sector are met.</li> <li>• To support programme partners in the creation and delivery of effective energy-management strategies as a means of improving the quality and viability of housing in the low-income sector generally.</li> </ul>
<b>Purpose</b>	Reduce energy consumption of low-income residents by 100 MW, while saving them money.
<b>Operating Dates</b>	Launched in March 2006; implementation of end-use lighting and appliance upgrades to be completed by end of 2006.
<b>Eligibility Requirements</b>	The programme is available to Ontario residents only. The initial phase is available to the 5,000 units who have undertaken an energy audit in summer 2005 through Social Housing Services Corporation (SHSC) Energy Management Program. It is intended that this phase will be expanded to include all 250,000 social housing units by the end of 2006. In 2007, the programme will be expanded to other low-income households and First Nations communities across the province.
<b>Type, size and number of customers targeted</b>	750,000 low-income units across Ontario.
<b>Savings</b>	10 MW by end of 2006; 100 MW by end of 2007 (projected).
<b>Role of Market Actors</b>	The programme is funded by the Conservation Bureau and delivered in conjunction with other programme stakeholders. SHSC manages aspects of the programme relating to the Green Light initiative, a province-wide initiative to help social housing providers take action to reduce energy use in their buildings. Other potential programme partners include First Nations consultants, Natural Resources Canada, the Canadian Mortgage and Housing Corporation and local distribution companies.
<b>Costs</b>	The Conservation Fund has an annual budget of \$1.5 million. Funding allocation will generally be limited to a range from \$10,000 to \$250,000 per project.
<b>Benefits to participants</b>	Lower energy costs, potentially for the long term.
<b>Take up of the Programme</b>	Not known.
<b>Key Barriers</b>	Sustaining efforts to improve the efficiency of low-income residences in the long term (including equipment use and maintenance); convincing low-income residents to implement the measures.
<b>Marketing Strategies</b>	Education; partnership with low-income housing agencies and providers, most notably the existing Green Light Initiative.

<b>Contact Information</b>	Conservation Fund: <a href="mailto:conservationfund@powerauthority.on.ca">conservationfund@powerauthority.on.ca</a> , 416-967-7474; SHSC Green Light program: <a href="mailto:energy@shscorp.ca">energy@shscorp.ca</a> ,
<b>Website</b>	<a href="http://www.conservationbureau.on.ca/Page.asp?PageID=122&amp;ContentID=1579&amp;SiteNodeID=129&amp;BL_ExpandID=143&amp;BL_ExpandID=143&amp;BL_ExpandID=143">http://www.conservationbureau.on.ca/Page.asp?PageID=122&amp;ContentID=1579&amp;SiteNodeID=129&amp;BL_ExpandID=143&amp;BL_ExpandID=143&amp;BL_ExpandID=143</a>

### 3.1.6 Residential Energy Efficiency Programs

<b>Programme Name</b>	Residential Energy Efficiency Programmes.
<b>Sponsoring Organisation</b>	Natural Resources Canada's Office of Energy Efficiency (OEE).
<b>Description of the Programme</b>	<ul style="list-style-type: none"> <li>• <u>EnerGuide for Houses Retrofit Incentive Programme</u> – This program, discontinued in May, offered incentives and technical assistance to residential property owners in Canada.</li> <li>• <u>EnerGuide for New Houses</u> – For about \$350, EnerGuide expert advisors review building blueprints and make upgrade recommendations about: air leaks &amp; sealing, structural heat maintenance, windows &amp; doors, passive solar heat &amp; house orientation, heating system efficiency &amp; distribution, and air exchange systems (e.g., exhaust fans). An advisor develops pre-construction analysis and reports, performs a post-construction blower door test, and provides an EnerGuide for New Houses rating. Canada Mortgage and Housing Corporation (CMHC) offers a 10% mortgage loan insurance premium refund for CMHC-insured financing to purchase EnerGuide-certified houses.</li> <li>• <u>R-2000 Standard</u> – This initiative includes requirements related to energy efficiency, indoor air quality, and the use of environmentally responsible products and materials. Rather than specifying how a house must be built, R-2000 sets performance criteria that leave the designer and builder free to choose the most effective and economical way to build it. Builders must be R-2000-certified. The house must: operate within a specific energy budget (generally 30 percent below conventional new home standards); possess whole-house ventilation; feature a number of indoor air and environmental options from a "pick-list;" provide clean heating; conserve water; and undergo a certification inspection.</li> <li>• ENERGY STAR for New Homes is a pilot project in Ontario, managed for Natural Resources Canada by EnerQuality Corporation. New homes that receive the ENERGY STAR label will be 40% more efficient than those built to minimum Ontario building code standards.</li> <li>• The OEE maintains a website featuring extensive information about major appliances as well as lists of models and manufacturers. Appliances include: refrigerators, freezers, major electric cooking appliances, dishwashers, clothes washers &amp; dryers, dehumidifiers, bottled water coolers, and more.</li> <li>• The OEE also has a list of regional programs that provide incentives for household energy efficiency.</li> </ul>
<b>Purpose</b>	All of these programs are designed to increase residential energy efficiency. R-2000 and EnerGuide are standards/systems that aim to improve efficiency in new homes. Other assistance aims at broader efficiency improvements.
<b>Operating Dates</b>	Established in April 1998 as part of Natural Resources Canada, the OEE's mandate is to renew, strengthen and expand Canada's commitment to energy conservation and energy efficiency. The OEE originated out of Canada's commitment to reduce greenhouse gas emissions by 6 percent below 1990 levels by the period between 2008 and 2012, as agreed to in the Kyoto Protocol.
<b>Eligibility Requirements</b>	Varies by programme.

<b>Type, size and number of customers targeted</b>	All Canadian residences; some programmes focus on new, some on old houses; some focus on individual houses, whereas others focus on housing developments and large apartment buildings.
<b>Savings</b>	<p>According to OEE's annual assessment of trends in energy use and related greenhouse gas (GHG) emissions in Canada since 1990, <i>Energy Efficiency Trends in Canada</i>, Canada has experience a 13% improvement in energy efficiency from 1990-2003, saving \$13.4 billion in energy costs in 2003 alone. Energy use in Canada increased by 22% over that time, rather than the 32% that would have taken place, and energy-related GHG emissions are more than 52 megatonnes lower than they would have been. A significant portion of these savings are attributable to OEE initiatives.</p> <p>The residential sector accounted for 17 percent of secondary energy use in Canada and 16 percent of related greenhouse gas (GHG) emissions in 2003. Between 1990 and 2003, residential energy use increased by 13 percent. The increase in energy use was largely driven by an increase in activity and a colder winter and warmer summer in 2003 relative to 1990. Without energy efficiency improvements, energy use would have risen by 32 percent between 1990 and 2003, instead of the observed 13 percent. These energy use improvements saved Canadians almost \$4.3 billion in 2003 alone. GHG emissions from the residential sector increased by about 15 percent between 1990 and 2003. This was principally due to increased energy consumption and a rise in the average GHG intensity of fuels used to generate electricity.</p>
<b>Role of Market Actors</b>	Various.
<b>Costs</b>	Various.
<b>Benefits to participants</b>	Energy costs savings; enables Canada to meet Kyoto GHG targets.
<b>Take up of the Programme</b>	EnerGuide for Existing Buildings was not highly successful and has thus been discontinued.
<b>Key Barriers</b>	Various.
<b>Marketing Strategies</b>	All of these programs are marketed on the OEE website.
<b>Contact Information</b>	See website for program-specific and regional contact info.
<b>Website</b>	<a href="http://oee.nrcan.gc.ca/residential/personal/new-homes.cfm?attr=4">http://oee.nrcan.gc.ca/residential/personal/new-homes.cfm?attr=4</a>

### 3.1.7 Canadian Industry Programme for Energy Conservation (CIPEC)

<b>Programme Name</b>	Canadian Industry Programme for Energy Conservation (CIPEC).
<b>Sponsoring Organisation</b>	OEE, industry associations.
<b>Description of the Programme</b>	CIPEC is a voluntary partnership between the Government of Canada and industry to improve Canada's industrial energy efficiency. CIPEC brings together industry associations and companies that represent more than 95% of all industrial energy use in Canada. Senior executives from leading industrial companies govern CIPEC through an executive board. CIPEC sector task forces, comprised of more than 40 industrial associations and hundreds of companies, set targets and develop action plans to improve energy efficiency in more than 25 industrial sectors. Members of the Task Force Council meet regularly to exchange ideas and recommend ways to address common needs associated with reducing energy costs and greenhouse gas emissions. More than 550 companies have registered as Industrial Energy Innovators, committing to meet specific energy efficiency targets. Natural Resources Canada's Office of Energy Efficiency (OEE) provides Secretariat services to organise meetings, benchmark energy intensity in various sectors, develop guidebooks, and deliver workshops.
<b>Purpose</b>	To improve Canada's industrial energy efficiency.
<b>Operating Dates</b>	CIPEC has been in existence since 1975. The deadline for submission of applications to the Industrial Energy Audit Incentive programme is December 22, 2006. Once Natural Resources Canada has approved an application, the audit must be completed by March 31, 2007.
<b>Eligibility Requirements</b>	Any industrial company in Canada can join the Industrial Energy Innovators network. A senior company official must simply fill out and mail a template letter to CIPEC and OEE confirming the company's commitment to implement energy efficiency measures and report on its progress.
<b>Type, size and number of customers targeted</b>	All industrial companies in Canada are targeted.
<b>Savings</b>	CIPEC publishes an annual progress report detailing sector-specific progress, targets, and challenges as well as company-specific case studies. According to the most recently available report, from 2003-2004, Canadian companies rely increasingly on CIPEC for the guidance and expertise to curtail energy costs and boost profitability. Its over 5000 member companies have reduced their combined energy intensity by 8.7% between 1990 and 2003, or an average of 0.7% per year, saving approximately <b>\$3.4 billion in purchased energy in 2003</b> , enough energy to heat 4.8 million Canadian households. Had energy intensity remained constant, industry's greenhouse gas emissions would have been 27.8 megatonnes higher.
<b>Role of Market Actors</b>	Explore and communicate energy efficiency strategies within companies and share with other CIPEC participants; meet energy efficiency targets.
<b>Costs</b>	In recent years, advances in energy efficiency have become more difficult to achieve, and the improvement curve has flattened due to increased costs and less room for improvement using existing technologies.

<b>Benefits to participants</b>	<p>Industrial Energy Innovators receive the following benefits (some of which are available to other CIPEC members):</p> <ul style="list-style-type: none"> <li>• <u>Energy audit incentives</u> – Funding is available to Innovators for up to 50 percent of the cost of an energy audit, up to \$5,000.</li> <li>• <u>Industrial Building Incentive Programme</u> – This demonstration initiative offers up to \$80,000 for eligible organisations for a building that consumes 25 percent less energy than a reference building.</li> <li>• <u>Dollars to \$ense</u> – OEE offers workshops to teach energy-saving practices that help companies to improve operating costs, competitiveness, and operational efficiency, while reducing GHG emissions.</li> <li>• <u>Employee Awareness Programme</u> – OEE’s employee awareness toolkit helps companies develop Employee Awareness Programs (EAP) within their organisations. The posters, fact sheets, stickers, slide presentations, and other materials seek to explain how every-day actions can significantly reduce energy waste, decrease operating costs, and increase competitiveness.</li> <li>• <u>Benchmarking information, studies, technical guides and the Heads Up CIPEC newsletter</u></li> <li>• <u>Energy Managers Network</u> – opportunities to share ideas and success stories. This is a network of professional energy management practitioners from Canadian industrial companies who strive to share knowledge, information, tools, and skills. Consultants and educators may apply for membership privileges.</li> <li>• <u>Energy Management Services Directory.</u></li> </ul>
<b>Take up of the Programme</b>	<ul style="list-style-type: none"> <li>• CIPEC represents more than 95% of industry in Canada; 40 industrial associations; over 5000 companies, including over 550 Innovators, participate in CIPEC.</li> <li>• More than 9000 representatives from over 4500 organisations from across Canada have enrolled in Dollars to \$ense workshops.</li> </ul>
<b>Key Barriers</b>	Enforcing Innovator targets; ensuring successful implementation of efficiency measures taught through workshops and other media.
<b>Marketing Strategies</b>	Industry associations, workshops, written media (newsletter, toolkits, website, etc.)
<b>Contact Information</b>	<p><b>Michael Burke</b>, Director, Industrial Programs Div., (613) 996-6872  Also see CIPEC Contact page:  <a href="http://oee.nrcan.gc.ca/industrial/opportunities/cipec/secretariat.cfm?attr=24">http://oee.nrcan.gc.ca/industrial/opportunities/cipec/secretariat.cfm?attr=24</a></p>
<b>Website</b>	<a href="http://oee.nrcan.gc.ca/industrial/cipec.cfm?attr=0">http://oee.nrcan.gc.ca/industrial/cipec.cfm?attr=0</a>

## 3.2 Peak Demand Reduction Programmes

### 3.2.1 It's Up 2 You

<b>Programme Name</b>	It's Up 2 You.
<b>Sponsoring Organisation</b>	Ontario Conservation Bureau.
<b>Description of the Programme</b>	This programme encourages building occupants to help decrease the summer peak cooling load. The strategy aims to convince building owners to increase building temperatures by two degrees during peak load hours while engaging managers, building tenants, and employees in a series of initiatives to make working in an environment with a slightly higher temperature comfortable.
<b>Purpose</b>	Reduce AC share of peak summer load.
<b>Operating Dates</b>	June 29, 2006 to end of summer.
<b>Eligibility Requirements</b>	Toronto building owners.
<b>Type, size and number of customers targeted</b>	Toronto businesses and residents.
<b>Savings</b>	Not known.
<b>Role of Market Actors</b>	The Conservation Bureau is working with Toronto's Building Owners and Management Association (BOMA), notably a group of high-profile early adopters, as well as a group of high-profile "Ambassadors of Conservation" (to be announced).
<b>Costs</b>	Marketing costs.
<b>Benefits to participants</b>	Lower cost of electricity during peak load season.
<b>Take up of the Programme</b>	A number of high-profile early adopters (new programme).
<b>Key Barriers</b>	In large buildings, it may be difficult to convince building managers to approve these changes affecting all building tenants or users. In general, many people may object to turning up the temperature.
<b>Marketing Strategies</b>	Radio announcements; secure high-profile participants; public recognition; website.
<b>Contact Information</b>	<a href="mailto:CECO@conservationbureau.on.ca">CECO@conservationbureau.on.ca</a>
<b>Website</b>	<a href="http://www.conservationbureau.on.ca/Page.asp?PageID=122&amp;ContentID=1620&amp;SiteNodeID=129&amp;BL_ExpandID=143">http://www.conservationbureau.on.ca/Page.asp?PageID=122&amp;ContentID=1620&amp;SiteNodeID=129&amp;BL_ExpandID=143</a>

### 3.2.2 Demand Response Programme (DRP)

<b>Programme Name</b>	Demand Response Programme (DRP).
<b>Sponsoring Organisation</b>	Ontario Conservation Bureau.
<b>Description of the Programme</b>	The DRP is a voluntary programme that allows participants to receive monthly payments for curtailing their electricity demand based on short-term (3-hour-ahead) price forecasts. The market-based design enables consumers to curtail load in response to economic signals, primarily using existing equipment and processes.
<b>Purpose</b>	This initiative supports the Conservation Bureau's stated goal to reduce 2007 peak demand in Ontario by 5%.
<b>Operating Dates</b>	Beginning June 2005 (ongoing).
<b>Eligibility Requirements</b>	Projects can be based on load interruption, load shifting or behind the meter generation (excluding diesel, coal, bi-fuel, and bio-diesel). Projects must reduce electricity consumption by at least 500 kW for at least one hour. Each participant must offer a monthly "strike price" at which they are willing to curtail load. The strike price must be higher than the minimum defined Floor Strike Price. Project applicants must submit a measurement & verification (M&V) plan certified by an M&V consultant.
<b>Type, size and number of customers targeted</b>	Ontario electricity consumers with at least 500 kW of load.
<b>Savings</b>	Not known
<b>Role of Market Actors</b>	IESO provides price forecasts; consumers reduce usage during peak hours.
<b>Costs</b>	Programme administration; incentive payments.
<b>Benefits to participants</b>	Incentive payments; improved grid reliability; reduced peak electricity costs for everyone.
<b>Take up of the Programme</b>	Not known.
<b>Key Barriers</b>	Cumbersome application process.
<b>Marketing Strategies</b>	Not known.
<b>Contact Information</b>	<a href="mailto:DR.Questions@conservationbureau.on.ca">DR.Questions@conservationbureau.on.ca</a>
<b>Website</b>	<a href="http://www.conservationbureau.on.ca/Page.asp?PageID=861&amp;SiteNodeID=183&amp;BL_ExpandID=143">http://www.conservationbureau.on.ca/Page.asp?PageID=861&amp;SiteNodeID=183&amp;BL_ExpandID=143</a>

#### 4. Japanese Demand Management Services

The current DSM programmes in Japan have been split according to whether their primary benefits are likely to be energy efficiency or peak load reductions.

<b>Energy Efficiency Programmes</b>	<b>Peak Demand Reduction Programmes</b>
Top Runner Programme	Thermal Storage Systems for Air Conditioning
Eco Support Plan	
Eco2 Support (CO2 Diet)	
Energy Reform Tax System	
Subsidies for Energy Management Systems	
Energy Conservation Assistance	
Energy Efficient Product Retailer Assessment	
Energy Saving Labelling Programme	
Energy Control Designated Factories	
Energy Audits	

## 4.1 Energy Efficiency Programmes

### 4.1.1 Top Runner Programme

<b>Programme Name</b>	Top Runner Programme.
<b>Sponsoring Organisation:</b>	Japanese Government (METI) implemented through the Energy Conservation Law.
<b>Description of the Programme</b>	<p>The Top Runner programme is aimed at improving the energy efficiency of key products and applies to both Japanese and imported products. The key product groups include air-conditioners, fluorescent lights, refrigerators, TVs, Computers, VCRs, magnetic disk units and copying machines. The Top Runner Programme divides each of the products into several groups (recognizing they have different sizes and functions) and establishes an energy efficiency target for each group. This target is based on the model having the highest energy efficiency of each product group and if further improvement is expected this is added to the efficiency target.</p> <p>If manufacturers fail to reach the target set by the programme then measures such as recommendations to take steps to raise energy efficiency are issued by METI, followed by publication of the name of the manufacturers. If manufacturers do not follow the recommendation then a penalty is applied. In Japan standards are based on sales-weighted average efficiency of each manufacturers' shipment. This provides the scope for the manufacturer to keep all equipment on the market, but they would need to stimulate purchase of more energy efficient equipment to meet the sales weighted efficiency targets</p> <p>In 2003 a number of additional products were added to the Top Runner Programme. This included gas and oil space heaters and water heaters, gas cookers, electric bath seat warmer, vending machines and distribution transformers.</p>
<b>Purpose</b>	Raise the energy efficiency of key equipment.
<b>Operating Dates</b>	Enforced since 1999 and expanded in 2002/2003.
<b>Eligibility Requirements</b>	According to the law the standards are voluntary for manufacturers and retailers, but no manufacturers would risk the negative publicity of failing to meet the standards.
<b>Type, size and number of customers targeted</b>	Manufacturers and importers.

<b>Savings</b>	<p>Not easy to calculate as raising of overall efficiency. Expected energy saving are huge. Expected savings for years between 2003-2010 (published in 2001 Energy Efficiency Policies and Indicators) were:</p> <ul style="list-style-type: none"> <li>• 63% reduction in weighted average energy consumption for heat pumps;</li> <li>• 17% for fluorescent lights;</li> <li>• 16% for TVs;</li> <li>• 59% for VCR; and</li> <li>• 30% for refrigerators.</li> </ul> <p>As an example for TVs if 40% of the stock meets the new standard then 3000 GWH would have been saved in 2000.</p> <p>Overall the Top Runner Programme is expected to save 10 MtCO<sub>2</sub>.</p>
<b>Role of Market Actors</b>	None.
<b>Costs</b>	<p>Mostly absorbed by manufacturers.</p> <p>Compliance costs of testing whether manufacturers have reached the standards are not published, but could be sizeable.</p>
<b>Benefits to participants</b>	Avoid getting a penalty and named by MITI.
<b>Take up of the Programme</b>	All manufacturers of relevant items.
<b>Key Barriers</b>	Cost of improving the energy efficiency of products.
<b>Marketing Strategies</b>	Not needed as legal requirements.
<b>Contact Information</b>	METI.

#### 4.1.2 ECO Support Plan

<b>Programme Name</b>	Eco Support Plan (Eco Cute heat-pump water heater).
<b>Sponsoring Organisation:</b>	TEPCO (TEPCO supply approximately a 1/3 <sup>rd</sup> of electricity in Japan).
<b>Description of the Programme</b>	<p>Within the Eco Support plan, TEPCO help homes offices and shops reduce their CO<sub>2</sub> emissions. A key part of this is encouragement for the Eco Cute.</p> <p>Eco Cute is a CO<sub>2</sub> refrigerant heat-pump water heater developed and introduced in Japan in 2001 as the first commercial product of its kind. Compared with the traditional combustion based water heaters, the heat pump water heaters achieved about 30% savings in primary energy consumption and a reduction in greenhouse gas emissions by about 40%.</p> <p>As part of the Eco Support Plan in the household sector users of the Eco Cute product would be given 5,000 yen for CO<sub>2</sub> savings that are estimated to be generated for 15 years by introducing high efficiency appliances.</p> <p>In the commercial sector the effectiveness of energy saving improvements are measured and evaluated with 600 yen being provided for every ton of CO<sub>2</sub> reduced over a five year period. An independent organisation verifies the CO<sub>2</sub> savings and issues CO<sub>2</sub> reduction certificates.</p> <p>TEPCO also contributes the same amount of donation under this scheme to supporting forest conservation activities, leading to sequestering CO<sub>2</sub> in the atmosphere.</p>
<b>Purpose</b>	Reducing consumption of CO <sub>2</sub> .
<b>Operating Dates</b>	Eco Support Plan was introduced in July 2004.
<b>Eligibility Requirements</b>	Need to install the Eco Cute heat pump water heater.
<b>Type, size and number of customers targeted</b>	Households and offices.
<b>Savings</b>	In Financial Year 2004 the plan saved 11,000 tons. In Financial Year 2005 the plan saved 29,000 tons.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Households need to invest in the Eco Cute.
<b>Benefits to participants</b>	Financial incentives as outlined above.
<b>Take up of the Programme</b>	<p>In 2004 11,000 customers in the household sector and 94 customers in the commercial sector participated.</p> <p>By March 31 2006 a total of about 120,000 Eco Cute units were in place in TEPCO's area. However, not all of these were funded by the Eco Support programme.</p>
<b>Key Barriers</b>	Costs of investing in the Eco Cute.
<b>Marketing Strategies</b>	Not known.

<b>Contact Information</b>	<a href="http://www.tepco.co.jp">www.tepco.co.jp</a>
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#### 4.1.3 ECO<sub>2</sub> Support (Including CO<sub>2</sub> Diet)

<b>Programme Name</b>	ECO <sub>2</sub> Support (CO <sub>2</sub> Diet Programme).
<b>Sponsoring Organisation:</b>	TEPCO.
<b>Description of the Programme</b>	<p>As from August 2002 TEPCO has been providing information on what households can do to mitigate climate change in its monthly energy usage statements for customers and on the company web site. The back of the electricity consumption notice contains a CO<sub>2</sub> check sheet that will allow customer to calculate the amount of CO<sub>2</sub> emissions for the amount of electricity and gas they consume. This can be calculated for each of the fuels consumed (electricity, gas, kerosene)</p> <p>A key part of the information programmes is the CO<sub>2</sub> Diet Programme</p> <p>TEPCO invites members of the community to join the CO<sub>2</sub>Diet program, in which participants make simple life style changes at home to reduce CO<sub>2</sub> emissions. Individuals make a declaration to cut CO<sub>2</sub>.</p> <p>Individuals are using TEPCO's CO<sub>2</sub> household account book from Lifestyle CO<sub>2</sub>Diet internet page. The Diet gives simple but useful information to save energy. It also provides useful tools for participants to raise their awareness namely:</p> <ol style="list-style-type: none"> <li>1. CO<sub>2</sub> Household Account Once users input the amount of different types of energy used then a graph displaying the CO<sub>2</sub>emissions will be shown.</li> <li>2. Eco Style Planning Simulates the CO<sub>2</sub> emissions and monetary savings from energy saving in the kitchen and living room</li> <li>3. Introduction to Eco-Housework Provides advice from professionals on performing housework in a more eco friendly way.</li> </ol> <p>In addition this campaign to help prevent global warming donates young trees to elementary schools based on the number of people that participate.</p>
<b>Purpose</b>	Encourages customer to reduce energy consumption.
<b>Operating Dates</b>	The CO <sub>2</sub> Diet began in August 2004. Better provision of information on monthly statements has been in existence since 2002.
<b>Eligibility Requirements</b>	All participating households need access to the internet.
<b>Type, size and number of customers targeted</b>	All households.
<b>Savings</b>	In 2006 TEPCO reported that 300,000 people have made this CO <sub>2</sub> declaration resulting in a CO <sub>2</sub> reduction of 25,000 tons.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	None.
<b>Benefits to participants</b>	Provides advice as to how to save energy.

<b><i>Take up of the Programme</i></b>	300,000 by 2006.
<b><i>Key Barriers</i></b>	Being aware of the site and wanting to make energy efficiency improvements.
<b><i>Marketing Strategies</i></b>	Press releases, adverts and involvement of TEPCO Staff. TEPCO run an employee CO2 diet and in 2005 over 13,000 employees took part.
<b><i>Contact Information</i></b>	<a href="http://www.tepco.co.jp">www.tepco.co.jp</a>

#### 4.1.4 Energy Reform Tax System

<b>Programme Name</b>	Energy Reform Tax System.
<b>Sponsoring Organisation:</b>	Japanese Government.
<b>Description of the Programme</b>	<p>Two taxation measures are offered to promote investment in energy efficient equipment. This is for projects that have been approved in accordance with the Energy Conservation and Recycling Law. Options are:</p> <ul style="list-style-type: none"> <li>• A tax deduction amounting to 7% of the equipment acquisition costs (this should not be more than 20% of the corporate tax payable); or</li> <li>• A special depreciation that allows companies to depreciate a maximum of 30% of the acquired value in addition to the normal depreciation in the year of acquisition.</li> </ul> <p>In order to qualify for this allowance the equipment needed to guarantee a 5% reduction in energy use.</p>
<b>Purpose</b>	Encourage installation of energy efficient measures.
<b>Operating Dates</b>	1996 onwards.
<b>Eligibility Requirements</b>	Approved equipments that will meet savings targets.
<b>Type, size and number of customers targeted</b>	From 1999 this measure was restricted to small and medium sized firms.
<b>Savings</b>	Not quantified but substantial (see take up below).
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Tax costs to the government.
<b>Benefits to participants</b>	Lower cost introduction of energy efficient equipment.
<b>Take up of the Programme</b>	Figures for mid 1990's show around 25,000 pieces of equipments being installed each year with an additional investment for the period 1996-1998 of \$4bn.
<b>Key Barriers</b>	Still have to invest in the equipment.
<b>Marketing Strategies</b>	Not known.
<b>Contact Information</b>	www.eccj.or.jp

#### 4.1.5 Subsidies for Energy Management Systems

<b>Programme Name</b>	Promoting the introduction of high efficiency energy systems in Houses and buildings.
<b>Sponsoring Organisation:</b>	New Energy and Industrial Technology Development Organisation (NEDO).
<b>Description of the Programme</b>	<p>MITI provides subsidy through (NEDO) to introduce Home Energy Management Systems. These help manage energy consumption of appliances such as lighting, air conditioning and hot water supply by using information technology system.</p> <p>These IT systems allow automatic management of several appliances at the same time leading to energy savings and reduced environmental impact.</p> <p>Phase 1 which ran from 2001-2005 was focused on verification of the energy conservation impact as well as the pricing mechanism/incentive function. In Phase 2 it is intended that home appliance manufacturers, information service businesses and power companies will work together to provide these services to customers.</p>
<b>Purpose</b>	Encourage home energy management systems.
<b>Operating Dates</b>	Phase 1 Field test verification ran from 2001-2005 Phase 2 Full scale system promotion is running now
<b>Eligibility Requirements</b>	Need to install an Energy Management system.
<b>Type, size and number of customers targeted</b>	Envisaged that larger number will be targeted in current phase.
<b>Savings</b>	Not known.
<b>Role of Market Actors</b>	It is hoped that a number of companies will work as a consortium to provide these services to customers.
<b>Costs</b>	Not known.
<b>Benefits to participants</b>	Energy management system should minimise energy use.
<b>Take up of the Programme</b>	Not known.
<b>Key Barriers</b>	Cost of energy management system.
<b>Marketing Strategies</b>	Not known.
<b>Contact Information</b>	NEDO

#### 4.1.6 Energy Conservation Assistance (Low interest loans)

<b>Programme Name</b>	Energy Conservation Assistance.
<b>Sponsoring Organisation:</b>	Development Bank of Japan.
<b>Description of the Programme</b>	<p>This programme was established by the 1993 Energy Conservation Assistance Law and allowed for interest subsidies where a commercial building has implemented measures that meet the energy conservation guidelines specified by the ministry. This includes utilising equipment and building materials that contribute to the rational use of energy. Business that meet the criteria specified need to submit an activity plan to the appropriate minister for approval.</p> <p>These loans are provided by the Development Bank of Japan and are long-term low interest loans for the total construction costs of buildings having high energy efficiency and incorporating measures to reduce the environmental burden. There are also options of other assistance under this Law including a Bond under the Industrial Foundation Improvement Fund or exemptions from taxation.</p> <p>Enterprises that adopt appliances certified by the International Energy Star Programme can also apply for low interest loans from the Japan Development Bank.</p>
<b>Purpose</b>	Encourage uptake of energy efficiency measures.
<b>Operating Dates</b>	1993 planned for 10 years.
<b>Eligibility Requirements</b>	Submit an activity plan to the appropriate minister.
<b>Type, size and number of customers targeted</b>	Business customers.
<b>Savings</b>	Not known.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Cost to the business of installing or improving the equipment.
<b>Benefits to participants</b>	Low interest loan.
<b>Take up of the Programme</b>	Not known.
<b>Key Barriers</b>	Still the cost of investment.
<b>Marketing Strategies</b>	Not known.
<b>Contact Information</b>	Development Bank of Japan

#### 4.1.7 Energy Efficient Product Retailer Assessment System

<b>Programme Name</b>	Energy Efficient Product Retailer Assessment System.
<b>Sponsoring Organisation</b>	Energy Conservation Center, Japan.
<b>Description of the Programme</b>	<p>In order to promote energy efficient products it was felt essential to introduce measures for appliance retailers who are the contact point with customers.</p> <p>The assessment system is targeted at large home appliance retailers who meet two criteria</p> <ul style="list-style-type: none"> <li>• A floor space of at least 1,000 square meters; and</li> <li>• At least 50% of sales coming from home appliances.</li> </ul> <p>Stores that actively promote energy efficient products or provide appropriate energy conservation information will be able to be recognised as top retailers and be authorized to carry a special logo. Top 'energy efficient product promotion stores' are selected each year and publicised along with their rankings.</p>
<b>Purpose</b>	To demonstrate that stores are energy efficient.
<b>Operating Dates</b>	Introduced 2003 still current.
<b>Eligibility Requirements</b>	Large home appliance retailers with a floor space of at least 1,000 square meters and 50% of sales from home appliances.
<b>Type, size and number of customers targeted</b>	Large retail stores.
<b>Savings</b>	Not quantified but should help domestic customer to deliver energy savings through more efficient appliances.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Small cost to retailers in providing services.
<b>Benefits to participants</b>	<p>Top energy efficient product promotion stores are publicised each year along with their rankings.</p> <p>Stores selected as top retailers are authorised to carry a special logo.</p>
<b>Take up of the Programme</b>	Not Known.
<b>Key Barriers</b>	Not Known.
<b>Marketing Strategies</b>	Promotion of successful stores.
<b>Contact Information</b>	Energy Conservation Center, Japan

#### 4.1.8 Energy Saving Labelling System

<b>Programme Name</b>	Voluntary Energy Saving Labelling Programme for Efficiency Improvements of Home Appliances.
<b>Sponsoring Organisation</b>	Energy Conservation Center, Japan, META.
<b>Description of the Programme</b>	<p>The Energy Conservation Law requires labelling of product name, model, energy consumption efficiency and power fuel consumption of each designated product. The labelling does not require energy consumption performance relative to that of other products.</p> <p>To provide this information the voluntary Energy Saving Labelling Programme was launched in August 2000. This should enable consumers to compare energy efficiencies so they can select products with higher energy efficiency. By August 2004 there were 13 products for this voluntary labelling programme including Air Conditioners, Fluorescent Lights, TVs, Refrigerators, Freezers, Space heater, Electric toilet seats, Computers, Magnetic Disk Units and Transformers</p> <p>The new voluntary labels show the Symbol mark, Top Runner target for the fiscal year, Achievement rate relative to Top Runner target and energy consumption efficiency. This is best shown in the label below. Orange means failure to meet target, green means 100% of target achieved.</p> <div data-bbox="483 961 1247 1564" style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;"><b>Method of Indication</b> Voluntary Energy Saving Labeling Program</p> <p>★ <b>Case 1: Target still not achieved</b> Symbol colored in orange</p> <p>★ <b>Case 2: Target achieved</b> Symbol colored in green</p> <p style="font-size: small;">* The label size differs depending on the space available for indication etc.</p> </div> <p>METI designates and promulgates the criteria to serve as judgment guidelines for each product.</p>
<b>Purpose</b>	Easier for consumers to see energy efficiency of each product.
<b>Operating Dates</b>	2000 onwards with more products added in August 2004.
<b>Eligibility Requirements</b>	Voluntary programme.

<b><i>Type, size and number of customers targeted</i></b>	Manufacturers.
<b><i>Savings</i></b>	Hard to quantify but may have encouraged purchase of energy efficient appliances.
<b><i>Role of Market Actors</i></b>	None.
<b><i>Costs</i></b>	None.
<b><i>Benefits to participants</i></b>	Allow manufacturers of energy efficient appliances to demonstrate the benefits to end customers.
<b><i>Take up of the Programme</i></b>	Not known.
<b><i>Key Barriers</i></b>	Manufacturers Choice.
<b><i>Marketing Strategies</i></b>	Not known.
<b><i>Contact Information</i></b>	Energy Conservation Center, Japan

#### 4.1.9 Energy Control Designated Factories

<b>Programme Name</b>	Energy Control Designated Factories.
<b>Sponsoring Organisation:</b>	MITI.
<b>Description of the Programme</b>	<p>Factories above a certain size have a requirement to have a certified energy manager and report the status of their energy consumption every year to MITI and the Ministry responsible. The original law was aimed at large factories with energy consumption of 12 GWh covering about 3,500 installations.</p> <p>The revised energy consumption law passed in 1998 brings this down to 6 GWh covering about 9,000 medium sized factories. The measure within this act include obligations to:</p> <ul style="list-style-type: none"> <li>• Make efforts for rationalisation of energy use (Judgment is by METI);</li> <li>• Select energy managers;</li> <li>• Attend lectures on energy conservation; and</li> <li>• Record condition of energy use</li> </ul> <p>The Energy Conservation Law allows the METI minister to instruct a failing factory to create a rationalisation plan.</p> <p>On site surveys have focused mainly on efforts to broaden and enhance awareness of the Energy Conservation Law. This involves checks of key items of equipment at factories and whether energy management manuals have been compiled with. Implementation of on-site surveys started in April 2001 with all factories due to be visited in a five year period.</p>
<b>Purpose</b>	Reduce factories consumption of energy.
<b>Operating Dates</b>	Has been run in different formats since 1979.
<b>Eligibility Requirements</b>	Size of factory.
<b>Type, size and number of customers targeted</b>	Large factories using above 6 GWh p/a.
<b>Savings</b>	Substantial due to size of factories.
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Costs to the factories to comply.
<b>Benefits to participants</b>	Compulsory.
<b>Take up of the Programme</b>	Compulsory.
<b>Key Barriers</b>	None – Legal requirements.
<b>Marketing Strategies</b>	Compulsory no marketing necessary.

<b>Contact Information</b>	METI
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#### 4.1.10 Energy Audits

<b>Programme Name</b>	Energy Audits.
<b>Sponsoring Organisation:</b>	Energy Conservation Center Japan (ECCJ).
<b>Description of the Programme</b>	<p>Energy audits are offered to small and medium sized factories as well as for commercial buildings.</p> <p>The small and medium factories are defined as those whose capital is less than 100 million yen or who have less than 300 employees. For these companies the audit will be free. The audit will last from 1-2 days with 1-2 auditors and provide advice on electricity usage and heat use.</p> <p>Energy audits for commercial building are also free of charge and involve two or three audit experts holding an interview with the persons in charge about the management standards for the building. The auditors then provide an on-the-spot opinion how the facilities in the building are operated. After the survey, the auditors produce a list of areas which need remedies and give advice for energy saving.</p>
<b>Purpose</b>	Improved the way energy is consumed.
<b>Operating Dates</b>	Operating since 1955 with over 5,600 energy audit around Japan
<b>Eligibility Requirements</b>	Small/medium factories or commercial buildings.
<b>Type, size and number of customers targeted</b>	Small/medium factories or commercial buildings.
<b>Savings</b>	Not quantified.
<b>Role of Market Actors</b>	Auditors provided free.
<b>Costs</b>	Cost of the auditors undisclosed.
<b>Benefits to participants</b>	Identification of ways to save energy and therefore money.
<b>Take up of the Programme</b>	5,600 separate audits since 1955 according to ECCJ websites.
<b>Key Barriers</b>	Not Known.
<b>Marketing Strategies</b>	Not Known.
<b>Contact Information</b>	Energy Conservation Center, Japan

## 4.2 Peak Demand Reduction Programmes

### 4.2.1 DSM with Thermal Storage Systems for Air Conditioning

<b>Programme Name</b>	Thermal storage systems for air conditioning.
<b>Sponsoring Organisation</b>	Tokyo Electric Power Company (TEPCO).
<b>Description of the Programme</b>	<p>The largest problem with the promotion of thermal storage systems are the increased construction costs of installing the thermal storage tank and the complication of the design.</p> <p>Help to overcome this cost barrier includes:</p> <ul style="list-style-type: none"> <li>(i) Cost reduction of electricity charges. TEPCO have nighttime electricity charges that are 1/3-1/4 of day time charges. TEPCO calculations show a reduction of 53% in electricity charges for a typical office building;</li> <li>(ii) Schemes run by TEPCO provide fixed incentives to manufacturers of ice storage systems in order to promote their widespread use.</li> </ul> <p>The Japanese Government is leading the introduction of thermal storage systems in public construction. They have also established a national center on thermal storage to achieve understanding by the population.</p>
<b>Purpose</b>	<p>Annual Power load factors of Japan are low (55%) compared with figures of 60-70% for most western countries. This disparity is believed to be due to differences in heating demand due to climatic differences.</p> <p>This programme aims to improve annual load factors by reducing the growth in peak power.</p>
<b>Operating Dates</b>	<p>The promotion of thermal storage systems for air conditioning in Japan was made a top government task after a cabinet meeting in May 1997.</p> <p>Support is provided in a number of ways as indicated above.</p>
<b>Eligibility Requirements</b>	Need to install thermal storage system.
<b>Type, size and number of customers targeted</b>	Large commercial building operators.
<b>Savings</b>	Potentially very large savings on energy costs (53% based on TEPCO calculations).
<b>Role of Market Actors</b>	None.
<b>Costs</b>	Additional costs of installing the thermal storage system for air conditioning.

<b>Benefits to participants</b>	<p>Participants gain from low priced off peak energy and financial incentives from TEPCO. In addition there are technical benefits to companies installing Thermal storage costs that do not rely on TEPCO incentives. These include</p> <ul style="list-style-type: none"> <li>(i) Reductions in equipment size and cuts in machine room space – Thermal storage systems allow reductions in the size of substations, pipes in machine rooms and control equipment. This reduces the requirement for office space which is an expensive commodity in Tokyo.</li> <li>(ii) Operating Convenience – Thermal storage systems mean that sudden air conditioning loads such as the morning peak can be met by utilizing the thermal storage tank. The alternative conventional heat source air conditioning systems will require the start up of heat source equipment.</li> </ul>
<b>Take up of the Programme</b>	Not known.
<b>Key Barriers</b>	Costs of installation.
<b>Marketing Strategies</b>	Not known.
<b>Contact Information</b>	Not known.

## 5. New Zealand Demand Management Services

Energy Efficiency programs run by the New Zealand EECA are managed across business sector lines.

<b>Energy Efficiency Programmes</b>	<b>Peak Demand Reduction Programmes</b>
Emprove	
Energy Efficiency of Products	
Home Rating Scheme	
EnergyWise Home Grants	
Solar Water Heating	

## 5.1 Energy Efficiency Programmes

### 5.1.1 Emprove

<b>Programme Name</b>	Emprove.
<b>Sponsoring Organisation:</b>	New Zealand EECA.
<b>Description of the Programme</b>	<p>The EECA Emprove is the general umbrella programme aimed at improving energy efficiency and energy management practices in the commercial sector. It focuses on all types of businesses, splitting the segment into business with less than 100K in revenues, less than 500K in revenues, and greater than 500K in revenues.</p> <p>Programmes include financial assistances with energy audits and energy efficiency improvements.</p>
<b>Purpose</b>	EECA Programme to improve energy efficiency in businesses, and maximize cost effective utilisation of energy efficiency.
<b>Eligibility Requirements</b>	Commercial Businesses.
<b>Savings</b>	Anticipated savings in 2012 to be 1.8-2.2 PJ of Energy, \$40-\$50 million in Energy Cost Savings, and 180,000-200,000 tonnes of CO <sub>2</sub> .
<b>Costs</b>	0.3-.5 million for energy audit grants, 2-3 million available for loans, and 0.5-.9 million in energy intensive business grants.
<b>Benefits to participants</b>	Financial assistance for energy audits, energy efficiency improvements.
<b>Key Barriers</b>	Not known.
<b>Marketing Strategies</b>	EECA marketing and events. Market research undertaken and a new section of the EECA business website developed to e-government standards to meet the needs of small to medium enterprises by January 2007.
<b>Contact Information</b>	<p>Phone (04) 470 2200          Fax (04) 499 5330          PO Box 388, Wellington          Level 1, Vector House, 44 The Terrace          Wellington</p>

### 5.1.2 Energy Efficiency of Products

<b>Programme Name</b>	Energy Efficiency of Products.
<b>Sponsoring Organisation:</b>	EECA.
<b>Description of the Programme</b>	System to establish Minimum energy Performance Standards, Minimum Energy Performance Labelling, and Voluntary Energy Star labelling for consumer products.
<b>Purpose</b>	Information to influence the purchase of energy efficient consumer products. Goal of having 20% of products display ENERGY STAR label by 2007
<b>Type, size and number of customers targeted</b>	Retailers and Manufacturers of Consumer Goods.
<b>Savings</b>	By 2012: 7-11PJ annually, \$175-\$275 million in Savings Annually, 1.2-2 million Tonnes of CO2 Avoided.
<b>Role of Market Actors</b>	Participate in Labelling Campaign.
<b>Benefits to participants</b>	Better and more competitive market for efficient appliances.

### 5.1.3 EnergyWise Home Grants

<b>Programme Name</b>	EnergyWise Home Grants.
<b>Sponsoring Organisation:</b>	EECA.
<b>Description of the Programme</b>	Financial assistance to retrofit existing home stock to energy efficient insulation levels. Goal is to have 40,000 homes retrofitted by 2008.
<b>Purpose</b>	Improve the energy efficiency of 900,000 Pre-1977 homes.
<b>Eligibility Requirements</b>	Own a Pre-1977 home.
<b>Savings</b>	By 2012, total savings of .2 to .4 PJ annually, 30,000 to 60,000 tonnes of avoided CO <sub>2</sub> , and \$4.5-9 million in health cost savings.
<b>Role of Market Actors</b>	Need installers for insulation equipment.
<b>Costs</b>	Relies on \$10.3 million of third party funding. \$5.42 million grant funding committed for insulation retrofits to 7,000-8,000 homes by 30 June 2007.
<b>Benefits to participants</b>	Better insulated homes will reduced their energy costs.
<b>Take up of the Programme</b>	As of 2006, 25,000 homes have been retrofitted.

#### 5.1.4 Home Energy Rating Scheme (HERS)

<b>Programme Name</b>	Home Energy Rating Scheme (HERS).
<b>Sponsoring Organisation:</b>	EECA.
<b>Description of the Programme</b>	<p>This programme is a rating system that is applied to residential homes. It is similar to the star rating currently used for appliances. This rating will allow owners and buyers of the property to be aware of the energy performance of their home and to make energy efficiency improvements.</p> <p>Households and landlords that participate in the scheme will receive information on the energy efficiency improvements they can make to their house. .</p>
<b>Purpose</b>	Owners and buyers will be better informed about the energy efficiency of their houses. Buyers/renters may use this information as one part of their valuation of the property. The list of potential measures may encourage landlords/buyers and new owners to undertake actions and improve the efficiency of the housing stock.
<b>Type, size and number of customers targeted</b>	The scheme is voluntary and open to all customers. However, the priority market is middle to high income earners and landlords who are responsible for pre-1977 houses. The Energy Efficiency Conservation Authority who runs this programme estimate this could be in the order of 250,000 houses.
<b>Savings</b>	Part of the EnergyWise Program. Anticipated savings are rolled into expectations for that program.
<b>Costs</b>	\$1.7m has been allocated from the 2006/07 budget. No indication is yet available as to how much the rating will cost for each property.

### 5.1.5 Solar Water Heating

<b>Programme Name</b>	Solar Water Heating.
<b>Sponsoring Organisation:</b>	EECA.
<b>Description of the Programme</b>	Combination of Financial Assistance, Information, and Quality Assurance to encourage the proliferation of solar water heating. Optimal target of 500,000 Square Meters of additional solar water heating by 2012.
<b>Purpose</b>	To encourage the growth and proliferation of solar water heating technology in New Zealand: <ul style="list-style-type: none"> <li>• Provides buyers with greater certainty of product and service quality through standards, accreditation procedures and training.</li> <li>• Provides incentives for solar water heating uptake to expand the current market and encourage new buyers.</li> <li>• Changing the perception of solar water heating through information and marketing programs.</li> </ul>
<b>Operating Dates</b>	Renewables programme started in 2001.
<b>Type, size and number of customers targeted</b>	Targeted at small and medium generation companies.
<b>Savings</b>	By 2102: .5PJ annually of additional solar thermal energy, lower prices of solar water heaters, 80,000 tonnes of CO <sub>2</sub> avoided.
<b>Benefits to participants</b>	Energy Savings on hot water heating costs.

## 6. Vermont

The Demand Side Management programmes run by Efficiency Vermont are split across Business Programmes and Residential Programmes. There is also an energy efficiency project financing programme that operates parallel to these two programs.

<b>Energy Efficiency Programmes</b>	<b>Peak Demand Reduction Programmes</b>
Existing Business Facilities	
New Business Facilities	
Existing Residential Homes	
New Residential Homes	
Retail Efficient Products	
Consumer Credit Program	

## 6.1 Energy Efficiency Programmes

### 6.1.1 Existing Business Facilities Assistance

<b>Programme Name</b>	Existing Business Facilities Assistance.
<b>Sponsoring Organisation:</b>	Efficiency Vermont.
<b>Description of the Programme</b>	<p>Programmes for existing facilities offer business owners both standardized, prescriptive and customised services.</p> <ul style="list-style-type: none"> <li>• Prescriptive services provide simple application and standardized financial incentives for businesses installing certain equipment upgrades.</li> <li>• Customised services include technical analysis and partnering with third parties for design and financing assistance.</li> </ul> <p>Existing Business Facilities includes:</p> <ul style="list-style-type: none"> <li>• Lighting rebates and information outreach for super T8 fixtures;</li> <li>• Lighting savings calculation tools;</li> <li>• Rebates and information on efficient HVAC options;</li> <li>• Rebates and information on efficient appliances; and</li> <li>• Rebates and information on efficient motor applications.</li> </ul>
<b>Purpose</b>	Encourage the uptake of Energy Efficient equipment and practices.
<b>Operating Dates</b>	2004.
<b>Eligibility Requirements</b>	Businesses receive rebates and assistance based on qualifying applications.
<b>Costs</b>	<p>Cost to businesses of installing proscriptive measures. For 2004 this was approximately \$7.1 million.</p> <p>Cost to programme for participant incentives. For 2004, this was approximately \$3.1million</p>
<b>Take up of the Programme</b>	617 Businesses, ranging from dairy farms to large industrial buildings, took advantage of the program.
<b>Marketing Strategies</b>	Industry and Utility Partnerships. Partnerships with advocacy groups. Website advertising.
<b>Contact Information</b>	<p>Efficiency Vermont  <a href="http://www.encyvermont.org/pages/">http://www.encyvermont.org/pages/</a>            255 S. Champlain Street, Suite 7, Burlington VT 05401</p>

### 6.1.2 Business New Construction Assistance

<b>Programme Name</b>	Business New Construction Assistance.
<b>Sponsoring Organisation:</b>	Efficiency Vermont.
<b>Description of the Programme</b>	<p>Programme aimed at businesses performing new construction during the project year. Programmes include:</p> <ul style="list-style-type: none"> <li>• Design assistance to integrate energy-efficient measures and building practices.</li> <li>• Assistance to contractors on energy efficiency practices.</li> <li>• Energy analysis of buildings and measures.</li> <li>• Financial incentives for energy efficiency measures.</li> <li>• Outreach to business that plan to start new construction projects.</li> <li>•</li> </ul>
<b>Purpose</b>	<ul style="list-style-type: none"> <li>• Lower energy use statewide.</li> <li>• Encourage the incorporation of energy efficiency as a baseline for design.</li> <li>• Motivate suppliers to stock high efficiency products.</li> <li>• Motivate construction community to regularly include energy. efficiency and market its benefits to customers.</li> </ul>
<b>Eligibility Requirements</b>	Businesses that plan on building new projects in the coming project year.
<b>Type, size and number of customers targeted</b>	<p>During 2004, EVT Targeted:</p> <ul style="list-style-type: none"> <li>• Dairy Farms: Worked with 71 Farms, who saved an estimated \$80K in annual costs. Focused on Water-cooled milk chillers and T-5 Lighting.</li> <li>• Multifamily Housing: Reduced costs in 1,689 multifamily units for a total of \$2.2 million in annual energy costs saved. Emphasis on ENERGY STAR Ratings, partnerships with housing developers, Super T8 lighting.</li> <li>• Schools: Worked with 51 Schools, reduced costs by \$1.2 million. Emphasis on education, student involvement.</li> <li>• Ski Areas: Worked with 9 ski areas, reduced energy costs by \$100K for each area. Emphasis on technical training, snowmaking controls. Improvements in Residential, Commercial and Industrial areas of the parks.</li> <li>• State Buildings: Worked on 20 State Buildings, expected to lower annual energy costs by \$175K. Emphasis on education, assistance and advice to state building engineers.</li> <li>• Water and Wastewater Facilities: worked on 19 wastewater facilities to reduce annual energy costs by \$174K. Emphasis on improved metering and analysis, leak detection.</li> </ul>
<b>Savings</b>	See Above
<b>Costs</b>	\$1.25 million in Incentives Paid, \$2.8 million in Participant Costs.
<b>Take up of the Programme</b>	See Above.
<b>Contact Information</b>	<p>Efficiency Vermont  <a href="http://www.efficiencyvermont.org/pages/">http://www.efficiencyvermont.org/pages/</a>            255 S. Champlain Street, Suite 7, Burlington VT 05401</p>



### 6.1.3 Residential Energy Services: Retail Efficient Products

<b>Programme Name</b>	Residential Energy Services: Retail Efficient Products
<b>Sponsoring Organisation:</b>	Efficiency Vermont
<b>Description of the Programme</b>	<p>Promote ENERGY STAR products, and provide financial incentives for ENERGY STAR CFLs, fixtures, ceiling fans with lights, clothes washers, room air conditioners, freezers, and refrigerators.</p> <p>Strengthen relationships with retailers, vendors and manufacturers of energy-efficient products.</p> <p>2004 Programme included:</p> <ul style="list-style-type: none"> <li>• Rebate for ENERGY STAR qualified freezers;</li> <li>• Lighting rebate coupons;</li> <li>• Buy-down offers to retailers and manufacturers; and</li> <li>• Commitment to national initiative to encourage computer manufacturers to use energy efficient power supplies in personal computers and servers.</li> </ul>
<b>Purpose</b>	<p>Promote the purchase of energy efficient appliances, especially ENERGY STAR qualified products.</p> <p>Strengthen relationships with retailers, vendors and manufacturers of energy-efficient products.</p>
<b>Eligibility Requirements</b>	Residential customers.
<b>Type, size and number of customers targeted</b>	Residential customers.
<b>Savings</b>	18,026 MWh saved in 2004, 129,394MWh since project inception.
<b>Costs</b>	\$1 million in incentives paid, \$4.5 million in costs to participants.
<b>Benefits to participants</b>	Lower energy bills.
<b>Take up of the Programme</b>	<p>Air Conditioning: 1,771 Participants</p> <p>Cooking and Laundry: 4,166 Participants</p> <p>Lighting: 31, 159 Participants</p> <p>Refrigeration: 1,106 Participants</p>
<b>Marketing Strategies</b>	Website marketing. Participation in national ENERGY STAR campaign. Launched nations' first ENERGY STAR retail centers – a central location to sell ENERGY STAR certified products.
<b>Contact Information</b>	<p>Efficiency Vermont</p> <p><a href="http://www.encyvermont.org/pages/">http://www.encyvermont.org/pages/</a></p> <p>255 S. Champlain Street, Suite 7, Burlington VT 05401</p>

#### 6.1.4 Existing Residential Homes

<b>Programme Name</b>	Existing Residential Homes.
<b>Sponsoring Organisation:</b>	Efficiency Vermont.
<b>Description of the Programme</b>	<p>Works with retailers, contractors, and renovators to disseminate knowledge of energy efficiency practices. Puts homeowners in touch with these builders.</p> <p>Works with homeowners by providing incentives and information about energy efficient building practices, appliances and lighting products.</p> <p>This programme also caters to low income single-family housing, with weatherisation assistance and installation of ENERGY STAR certified lighting and appliances.</p>
<b>Purpose</b>	Programme to support energy efficiency in existing Vermont homes.
<b>Savings</b>	Total 2004 net savings from programs, 3,805 MWh saved, 1,762 CCF of water saved.
<b>Costs</b>	\$920K in Incentives Paid, \$565K in Participant costs.
<b>Take up of the Programme</b>	<p>In the 2004 Project Year:</p> <ul style="list-style-type: none"> <li>• Air Conditioning: 39 Participants</li> <li>• Hot Water Efficiency: 441 Participants</li> <li>• Hot Water Fuel Switching: 317 Participants</li> <li>• Lighting: 1,149 Participants</li> <li>• Motors: 2 Participants</li> <li>• Other Fuel Switching: 2 Participants</li> <li>• Refrigeration: 431 Participants</li> <li>• Space Heat Efficiency: 42 Participants</li> <li>• Space Heat Fuel Switching: 131 Participants</li> <li>• Water Conservation: 1 Participant</li> </ul>
<b>Marketing Strategies</b>	<p>Training sessions on building performance issues, sales and marketing of energy efficiency measures.</p> <p>Contractor partnerships</p> <p>Promotional materials.</p>
<b>Contact Information</b>	<p>Efficiency Vermont</p> <p><a href="http://www.encyvermont.org/pages/">http://www.encyvermont.org/pages/</a></p> <p>255 S. Champlain Street, Suite 7, Burlington VT 05401</p>

### 6.1.5 Residential New Construction

<b>Programme Name</b>	Residential New Construction.
<b>Sponsoring Organisation:</b>	Efficiency Vermont.
<b>Description of the Programme</b>	Programs for builders and buyers of new homes. EVT provides technical assistance, plan reviews, on-site inspections, performance testing, energy ratings and ENERGY STAR labelling for qualified homes.
<b>Purpose</b>	Encourage energy efficient building practices.
<b>Type, size and number of customers targeted</b>	All new build homes in Vermont. In 2004 VT was among the top five states for total market share of ENERGY STAR qualified single family and multifamily homes.
<b>Savings</b>	Net MWh saved in 2004: 783, 14,053 MWh saved since project inception. 15,697 MMBTU of Fuel saved in 2004. 806 CCF of water.
<b>Costs</b>	\$318K in Incentives Paid, \$191,875 in Participant costs.
<b>Take up of the Programme</b>	Air Conditioning Efficiency: 43 Participants Cooking and laundry Efficiency: 454 Hot Water Efficiency: 394 Lighting: 468 Other Activities: 401 Refrigeration: 404 Space Heat Efficiency: 448 Ventilation: 423
<b>Marketing Strategies</b>	Print promotion, partnerships with contractors and other third parties.
<b>Contact Information</b>	Efficiency Vermont <a href="http://www.encyvermont.org/pages/">http://www.encyvermont.org/pages/</a> 255 S. Champlain Street, Suite 7, Burlington VT 05401

### 6.1.6 Customer Credit Programme

<b>Programme Name</b>	Customer Credit Programme.
<b>Sponsoring Organisation:</b>	Efficiency Vermont.
<b>Description of the Programme</b>	<p>Alternative financing path for customers who have the capability and resources to identify, analyse and undertake efficiency projects.</p> <p>Projects are customer initiated. The customer or its contractors must complete all technical analysis. Customer can receive cash incentives capped at 70% of their projected two-year contribution to the statewide energy efficiency fund. Customers can draw on contributions from the current year and either the previous or ensuing year. Market-driven projects are eligible for incentives For retrofits, customers can receive incentives that reduce the customer payback time to 18 months.</p>
<b>Purpose</b>	Provide financing for certain energy efficiency projects.
<b>Eligibility Requirements</b>	<p>Customers must:</p> <ul style="list-style-type: none"> <li>• Never accepted cash incentives from any Vermont utility Demand Side Management programme.</li> <li>• Show a corporate commitment to energy efficiency by participation in the United states EPA Climate Wise Program, or currently active similar programme as determined by the Public Service Board.</li> <li>• Have ISO 14001 Certification.</li> </ul>
<b>Savings</b>	2004 Net MWh saved: 947, Net Lifetime MWH: 13,625.
<b>Costs</b>	2004 Incentives Paid, \$223K, Participant Costs, \$40K.
<b>Take up of the Programme</b>	<p>Design Assistance:1            Lighting: 1            Motors: 1            Other Efficiency: 1            Refrigeration: 1</p>
<b>Contact Information</b>	<p>Efficiency Vermont  <a href="http://www.encyvermont.org/pages/">http://www.encyvermont.org/pages/</a>            255 S. Champlain Street, Suite 7, Burlington VT 05401</p>

## 7. Other International Programmes

A few selected additional international programmes have been included in this assessment. These have been split into those that are primarily energy efficiency programmes and those that are focused on peak load reduction.

<b>Energy Efficiency Programmes</b>	<b>Peak Demand Reduction Programmes</b>
Energy Efficiency Obligation – White Paper (Italy)	Critical Peak Pricing (Sweden)
Voluntary Agreements on Energy Efficiency in Trade and Industry (Denmark)	Danish Pilot Programme
Energy Managers (Italy)	California Statewide Pricing Pilot
	PJM Load Response
	Austin Energy Power Partner

## 7.1 Energy Efficiency Programmes

### 7.1.1 Critical Peak Pricing (Sweden)

<b>Programme Name</b>	Critical Peak Pricing.
<b>Sponsoring Organisation</b>	Skånska Energi.
<b>Description of the Programme</b>	A maximum 40 hours per year, customers in this pilot were notified of a higher than usual ("Critical") peak price a day before and are therefore given the opportunity to shift or reduce electricity load to avoid high peaks that range from 3,000 – 5,000 SEK per MWh. No additional technology is added for participating customers; this is simply a tariff that includes information and notification to yield savings for customers if they are reactive to notifications.
<b>Purpose</b>	The pilot was designed to study the elasticity of customer energy usage and other aspects of notification and usage software when customers are faced with high peak pricing a limited number of hours (40) per year.
<b>Operating Dates</b>	Effective dates and duration of CPP pilot unclear. Effective from July 2006 (legislative effective date) all customer with main fuses > 63 A must have hourly meters installed; beginning July 2009, all meters must be read once per month for billing.
<b>Eligibility Requirements</b>	Hourly meters already installed.
<b>Type, size and number of customers targeted</b>	The Skanska Energi CPP pilot targeted 100 large non-residential customers who already have hourly meters.
<b>Savings</b>	Not known.
<b>Role of Market Actors</b>	Skanska Energi provided online and called day-before notifications and tracks the energy usage of each pilot participant.
<b>Costs</b>	Not available.
<b>Benefits to participants</b>	<ul style="list-style-type: none"> <li>• Incentives for pilot customers to reduce peak consumption (and reap savings) through the disincentive of a high critical peak price 40 max hours per year.</li> <li>• Benefit for Skanska to study the effectiveness and logistics of price signals and information on customer behavior.</li> </ul>
<b>Take up of the Programme</b>	Not available.
<b>Key Barriers</b>	Current price levels (and limited peaks) do not drive incentives for demand response in Sweden. Pilots such as Skanska's are being conducted by several utilities to test the degree of customer responsiveness to price and information signals.
<b>Marketing Strategies</b>	Not known.

<b>Contact Information</b>	<p>Overview of Barriers to Demand Response in Sweden &amp; overview of pilot project: <a href="http://www.energy.sintef.no/arr/Capacity/pdf/DR%20-%20Market%20design%20aspects.pdf">http://www.energy.sintef.no/arr/Capacity/pdf/DR%20-%20Market%20design%20aspects.pdf</a></p> <p>Scandanavian DRR policy and regulatory opportunities (See Slide 9 for brief overview of metering development to support DRR in Sweden): <a href="http://www.energy.sintef.no/arr/Capacity/pdf/Nordic%20Regulatory%20perspectives.pdf">http://www.energy.sintef.no/arr/Capacity/pdf/Nordic%20Regulatory%20perspectives.pdf</a></p>
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### 7.1.2 Pilot Programme for Peak Pricing (Denmark)

<b>Programme Name</b>	Danish Pilot Programme.
<b>Sponsoring Organisations</b>	Elkraft System, Eltra, Seas, and Energy Piano.
<b>Description of the Programme</b>	<p>Automatic, price driven control of electric heating.</p> <p>Undertaken in 25 single family houses with direct electric heating. The following criteria were identified.</p> <ul style="list-style-type: none"> <li>• Consumption &gt; 16,000 kWh/yr</li> <li>• Individual setting controls the duration of interruption</li> <li>• Price driven control of 5 zones of electric heating</li> <li>• 3 price levels</li> <li>• 2 time periods (morning/afternoon)</li> <li>• Possible to override control</li> <li>• 100 hours of high prices in the winter (guaranteed)</li> <li>• Goal = 5 kW reduction per household (cold day)</li> </ul>
<b>Purpose</b>	<p>Demand response is aimed at</p> <ul style="list-style-type: none"> <li>• Better integration of electricity produced by wind turbines.</li> <li>• Creating stronger competition in relation to supply of control services.</li> <li>• Reducing the demand for investments in new capacity in grids and at power plants.</li> </ul>
<b>Operating Dates</b>	Duration of project not clear. Elkraft had previously conducted an industrial customer DR pilot that lasted 20 months, ending in January 2003.
<b>Eligibility Requirements</b>	Targeted pilot customer have an annual usage of 16,000 kWh/yr.
<b>Type, size and number of customers targeted</b>	This pilot programme only targetted 25 customers.
<b>Savings</b>	Not known
<b>Role of Market Actors</b>	NordPool provides spot price information in real time, which is loaded in real time to software the customers can access to make decisions about shifting or reducing load. The utility facilitates the meters and the platform for network data and settles with NordPool.
<b>Costs of the scheme</b>	Overall cost of the pilot is not clear.
<b>Benefits to participants</b>	Price driven tariffs would enable savings if responding to price signals.
<b>Take up of the Programme</b>	Not available.

<b>Key Barriers</b>	<p>Costs of technology</p> <p>Eastern Denmark (because of its proximity to the Swedish grid) has more Demand Response potential than Western Denmark at this time.</p>
<b>Marketing Strategies</b>	<p>Not clear. Since implementation is not broad-based, mass marketing is not required.</p>
<b>Contact Information</b>	<p>Whitepaper overview of DRR potential, recommendations in the Danish market:  <a href="http://www.eltra.dk/media(16183,1033)/Nordel_-_Dansk_TSO-plan_GB_ny.pdf">http://www.eltra.dk/media(16183,1033)/Nordel_-_Dansk_TSO-plan_GB_ny.pdf</a></p> <p>EFFLOCOM Overview:  <a href="http://www.nordpool.com/courses/Presentations/NPseminar_Dec03/Elkraft%20SystemDec03.pdf">http://www.nordpool.com/courses/Presentations/NPseminar_Dec03/Elkraft%20SystemDec03.pdf</a></p>

### 7.1.3 California Statewide Pricing Pilot

<b>Programme Name</b>	Statewide Pricing Pilot Programme (SPP)
<b>Sponsoring Organisation:</b>	The California Public Utilities Commission and the California Energy Commission. Implemented by the three large investor owned utilities (IOUs) in the state: Southern California Edison (SCE), San Diego Gas and Electric (SDG&E) and Pacific Gas and Electric (PG&E).
<b>Description of the Programme</b>	<ul style="list-style-type: none"> <li>• Nexus Energy Software was chosen to provide a Web-based energy bill analysis system for customers on the pricing pilot. Based on customer-provided survey information and hourly meter data, customers receive a monthly bill "Scorecard" with a personalized examination of the costs of air conditioning, lighting and other appliances during critical peak periods, and what can be saved by managing how those appliances are used.</li> <li>• A refined version of the software was deployed on a larger sample of customers, including a personalised Web page for each participant, as well as monthly e-mails and notices the evening before a "Critical Peak" day, when rates are especially high from 2 to 7 p.m. for residential customers (the peak is noon to 6 p.m. for non-residential customers). Customers without Internet access received mail reports.</li> <li>• Opinion Dynamics and EPRI Solutions are providing market research and evaluation services to determine the effectiveness of the bill information, comparing the participating customers to a control group of similar customers on the same rate.</li> </ul>
<b>Purpose</b>	<p>The project is part of the California Statewide Pricing Pilot begun in 2003 to evaluate the potential peak demand reduction benefits of time-based rates..</p> <p>Core objectives are:</p> <ul style="list-style-type: none"> <li>• Enhance system reliability</li> <li>• Reduce power purchases and consumer costs</li> <li>• Protect the environment</li> </ul>
<b>Operating Dates</b>	2003-2005.

<p><b>Eligibility Requirements</b></p>	<ul style="list-style-type: none"> <li>• Basic enrollment requirements included: the bill payer must occupy the home for residential customers (to avoid renting/owner complications over electricity decisions); customers could not be planning to move locations within the next six months; and customers were required to provide a land-based phone number where they could be reached for notifications of a “Shift &amp; Save” event (where super peak prices would be in effect if a CAL ISO emergency was declared). A maximum of 90 hours per year anytime during the noon-6 p.m. peak for C&amp;I customers; and a max of 15 days per year for residential customers could be declared a “super peak” time where prices were set as high as .75 cents per kWh to deter or encourage usage shifting.</li> <li>• All customers targeted (see targeting scheme) received a free advanced digital electric meter designed to facilitate energy information and management. Website portals were established for enrolled customers through their utility websites to check their usage online, using a password-protected login.</li> <li>• Residential and commercial customers were given a free Honeywell programmable thermostat. Adjustments to thermostats were encouraged by providing tips on pre-cooling and presettings (see marketing materials).</li> </ul>
<p><b>Type, size and number of customers targeted</b></p>	<ul style="list-style-type: none"> <li>• The initial marketing and enrollment for the pilot was premised on a sample design of 2,500 random customers, across residential and commercial classes in all three IOU territories participating in the program, with a 10x over sample to fill each “slot.”</li> <li>• The pilot pricing was designed as an “opt-out” program, but required an enrollment center operated by KEMA to confirm enrollment in writing. Each enrolled customer (the metered accounts were the unit of analysis for all customers) was randomly assigned into one of the following tariffs: Time of Use (with a peak and off-peak price), Critical Peak Pricing (with a peak, off-peak, and “super peak” price – invoked a limited number of days per year for residential customers and an limited number of hours per year for commercial customers when a load emergency was declared by the CAL ISO), or an “Information Only” group where they received all Programme information with no rate change.</li> <li>• Taking into account the tariff (TOU, CPP (fixed and variable versions), rate (summer vs. winter peaking areas), customer class (residential vs. C&amp;I) and service territory (SCE, PG&amp;E, SDG&amp;E), there were 32 permutations of customer enrollment in the pilot.</li> </ul>
<p><b>Savings</b></p>	<ul style="list-style-type: none"> <li>• Sending dynamic rates to customers achieved average peak load reductions ranging from 12% to 40% of baseline peak usage for different customer cohorts. The degree of reduction depended on the tariffed rate, weather, customer appliance holdings, and availability and use of demand response controls.</li> <li>• Residential and small to medium C&amp;I customers understand and overwhelmingly prefer dynamic rates to existing inverted tier rates. Sending dynamic prices to residential customers led to average peak savings of 14% and bill savings of \$60 per year.</li> </ul>

<b>Role of Market Actors</b>	The project sponsors of the pilot were critical in designing the pilot sample and collaborating to develop enrollment and marketing materials for pilot participation and retention. The three IOUs dedicated website portals to house customer billing and usage information in near-real time.
<b>Costs</b>	Approximately \$20 million.
<b>Benefits to participants</b>	Customer benefits include new meters, programmable thermostat, reduced bills, and more information about how to lower their electricity use and therefore reduce their electric bills.
<b>Take up of the Programme</b>	Target of 2500 customers were recruited.
<b>Key Barriers</b>	Pilot programmes so small number of customers recruited.
<b>Marketing Strategies</b>	<ul style="list-style-type: none"> <li>• Main marketing method was direct mail</li> <li>• Web site, bill stuffers, and initial marketing handbook also explained the role customers could play in reducing their electricity use and costs. These guides were customized by customer type, region, and rate treatment.</li> </ul>
<b>Contact Information</b>	<ul style="list-style-type: none"> <li>• Overview of the background of this Programme in the context of Demand Response regulatory efforts in CA: <a href="http://www.energy.ca.gov/papers/2004-08-31_ROSENFELD_ACEEE.PDF">http://www.energy.ca.gov/papers/2004-08-31_ROSENFELD_ACEEE.PDF</a></li> <li>• Comprehensive evaluation results from this pilot program: <a href="http://www.nwouncil.org/energy/dr/library/drrc_presentation.pdf">http://www.nwouncil.org/energy/dr/library/drrc_presentation.pdf</a></li> </ul>

## 7.2 Peak Demand Reduction Programmes

### 7.2.1 PJM Load Response

<b>Programme Name</b>	PJM Load Response Programs.
<b>Sponsoring Organisation:</b>	Pennsylvania, New Jersey and Maryland Power Grid.
<b>Description of the Programme</b>	PJM has 3 main programs. One is a price response programme with day ahead notification. The second is a price response programme with real-time price option. The third programme is an emergency programme where participants are called in the event of an emergency.
<b>Purpose</b>	Peak demand reduction is the major objective. Secondary objectives are to: <ul style="list-style-type: none"> <li>• Obtain compensation as balancing energy market resource;</li> <li>• Encourage use of load response technologies; and</li> <li>• Encourage use of more sophisticated metering.</li> </ul>
<b>Operating Dates</b>	2002-current for these programs.
<b>Eligibility Requirements</b>	End- use customers must be able to shed at least 100 kW. End-use customers in the price responsive programme need interval metering. Suppliers/distribution companies/ aggregators must belong to PJM. In the emergency programmes if the customer is not metered by PJM they must submit metering data within 60 days to be paid.
<b>Type, size and number of customers targeted</b>	Generally large business customers are targeted for these programmes.
<b>Savings</b>	Significant as shown in take up of the programme.
<b>Role of Market Actors</b>	Local distribution companies, aggregators, and competitive supplies play a large role in marketing the individual programmes.
<b>Costs</b>	Varies based on need for performance.
<b>Benefits to participants</b>	Incentive payments - most guaranteed the greater of the real time price or a minimum price.
<b>Take up of the Programme</b>	Price Responsive programs – 2113 MW Emergency Programme – 1783 MW  94 % of MWh reductions under the price responsive programme were under the real time option.
<b>Key Barriers</b>	Split incentives (between disco/ Transco / genco/ marketers) – to some extent addressed by having the distribution companies, aggregators and suppliers market the programme.

<b>Marketing Strategies</b>	Main marketing channels were distribution companies, suppliers and aggregator account managers. PJM staff worked closely on co-marketing of all Programme elements including <ul style="list-style-type: none"><li>• Meetings held with industry groups;</li><li>• Web sites of PJM and other parties</li></ul>
<b>Contact Information</b>	<a href="http://www.pjm.com/services/demand-response/demand-response.html">http://www.pjm.com/services/demand-response/demand-response.html</a>

### 7.2.2 Austin Energy Power Partner

<b>Programme Name</b>	Austin Energy Power Partner.
<b>Sponsoring Organisation:</b>	Austin Energy.
<b>Description of the Programme</b>	<p>Air Conditioning is reduced at time of system peak using a programmable thermostat.</p> <ul style="list-style-type: none"> <li>• Customers were given a free Honeywell Superstat™ programmable thermostat.</li> <li>• Customers were also given free AC checks for programmable thermostat compatibility and free programmable thermostat repair/replacement.</li> <li>• Most common cycling/set-point protocol: 33% duty cycle (10 minutes/half hour). Daily Cycling Window: 4–8 PM (residential), 3–8 PM (commercial). Cycling Season/Limits: No restrictions on # of days.</li> </ul>
<b>Purpose</b>	<p>Peak load reduction is the major objective</p> <p>Secondary objectives are to:</p> <ul style="list-style-type: none"> <li>• Broaden the utility's portfolio of rate options.</li> <li>• Obtain compensation as balancing energy market resource.</li> <li>• Encourage use of programmable thermostats.</li> </ul>
<b>Operating Dates</b>	2003 – current.
<b>Eligibility Requirements</b>	<ul style="list-style-type: none"> <li>• Residential or commercial with CAC 10 tons or less</li> </ul>
<b>Type, size and number of customers targeted</b>	<ul style="list-style-type: none"> <li>• Residential or commercial with CAC 10 tons or less, in good working order, and not controlled by another building automation system.</li> <li>• Municipal accounts with small tonnage CACs are also eligible.</li> <li>• Residential multifamily housing.</li> </ul>
<b>Savings</b>	Not known but significant due to number of customers signed up.
<b>Role of market actors</b>	None.
<b>Costs</b>	Not Known.
<b>Benefits to participants</b>	B/C data not readily available – similar scheme also in Texas had B/C of 1.1 Customer benefits include new thermostat, reduced bills, and AC check.
<b>Take up of the Programme</b>	30,000 customers.
<b>Key Barriers</b>	<p>The free thermostat removed a key cost barrier and also increased comfort</p> <p>Customers also receive free repairs/ replacement of thermostats to remove</p>

	informational barriers.
<b>Marketing Strategies</b>	Main marketing method was direct mail <ul style="list-style-type: none"><li>• Web site, bill stuffers, bill newsletter were also used as channels by the utility</li><li>• Meeting were held with HVAC contractors</li><li>• Trade shows.</li></ul>
<b>Contact information</b>	<a href="http://www.austinenergy.com">http://www.austinenergy.com</a>

### 7.2.3 Energy Manager Programmes (Italy)

<b>Programme Name</b>	Energy Manager Programme.
<b>Sponsoring Organisation</b>	Italian Federation for the Rational use of Energy (FIRE).
<b>Description of the Programme</b>	<p>There are two separate pieces of legislation that introduced requirements for energy managers dating all the way back to 1982. Today energy managers are required for large industrial consumers, large energy users in the civil and transport sector and public authorities. The threshold for needing an energy manager is set at 10,000 toe/year for companies in the industrial and tertiary sectors, and 1,000 toe/year for the remaining sectors (public administration). The Energy Manager can be an employee of the company subject to the obligation or a consultant.</p> <p>The law requires</p> <ul style="list-style-type: none"> <li>• Energy Managers to identify actions, interventions and procedures to ensure the promotion of rational use of energy.</li> <li>• Public sectors to apply efficient solutions in properties where these are technically or economically feasible.</li> <li>• Regional and city authorities (populations &gt; 50,000) need to evaluate energy saving potential in the wider economy.</li> </ul> <p>FIRE has created a network of Energy Managers that allowed the presentation of many case studies and best practice examples since 1992. This network including workshop and seminars has given the possibility to exchange many problems and solutions in the last decade.</p>
<b>Purpose</b>	Main purpose of the extended legislation in 1991 was to improve energy efficiency.
<b>Operating Dates</b>	First legislation introduced in 1982.
<b>Eligibility Requirements</b>	Mandatory for large consumers and public authorities.
<b>Type, size and number of customers targeted</b>	Large Customers and public authorities.
<b>Savings</b>	A 1998 survey by FIRE of Energy Manager found that 65% of them implemented energy efficiency measures in the previous three years. However, this may be slightly higher than the average as only 10-15% of energy managers responded to the survey.
<b>Role of Market Actors</b>	FIRE play a facilitation role in bringing energy managers together.
<b>Costs</b>	<p>FIRE estimates the expenses related to the administration of this task as approximately 125,000 €/year.</p> <p>There will be cost to each company and public authority in appointment of these energy managers, but these are not quantified.</p>
<b>Benefits to participants</b>	Mandatory but should also benefit by energy savings.

<b>Take up of the Programme</b>	Over the last decade there have been around 2,500 individuals appointed as energy managers. Despite being mandatory it does not appear that all companies that should have taken part in the programme have been involved. In particular there was evidence that the tertiary and public sector could do much better as the benefit from an energy manager is not as significant.
<b>Key Barriers</b>	Main barriers to the success of the programme are: <ul style="list-style-type: none"> <li>• The low hierarchical positions of some energy managers within their organisations;</li> <li>• The difficulty in convincing top managers and policy managers of the benefits of adopting the proposed measures; and</li> <li>• The fact that many public and civil users have not appointed an energy manager.</li> </ul>
<b>Marketing Strategies</b>	Mandatory to appoint an energy manager.
<b>Contact Information</b>	The Italian Federation for the Rational use of Energy Manager (FIRE). <a href="http://www.fire-italia.it">www.fire-italia.it</a>  The Italian Agency for New Technologies, Energy and Environment (ENEA).

#### 7.2.4 Energy Efficiency Obligation (Italy)

<b>Programme Name</b>	Energy Efficiency Obligation.
<b>Sponsoring Organisation</b>	Autorita per l'energia elettrica (AEEG). Assisted by ENEA (the National Agency for New Technologies, Energy and the Environment) with certifying the energy savings.
<b>Description of the Programme</b>	<p>The obligation sets national quantitative energy efficiency targets. Large electricity and gas distributors (&gt;100,000 customers) are obliged to take action. They have 4 options:</p> <ol style="list-style-type: none"> <li>1) Develop in-house energy efficiency programmes;</li> <li>2) Develop energy efficiency projects jointly with third parties;</li> <li>3) Buy on the market or via bilateral contracts tradable energy efficiency certificates; or</li> <li>4) Pay the penalty for non compliance with the obligation.</li> </ol> <p>At least half of each year's target has to be achieved via reduction of electricity and natural gas use. Costs incurred in carrying out projects can be recovered in gas and electricity tariffs. These costs have to meet AEEG criteria and are capped.</p> <p>Projects must be designed, implemented and validated according to AEEG criteria. Eligible projects will contribute to the achievement of targets for up to 8 years.</p> <p>Measurement and verification is an important part of the process undertaken by AEEG and ENEA. Only additional savings over and above market trends and legislative requirements are allowed. Three approaches are used:</p> <ol style="list-style-type: none"> <li>a) a default (deemed savings) approach with no on field measurement;</li> <li>b) an engineering approach with partial on field measurement; or</li> <li>c) an energy monitoring plan where no deemed savings or engineering methods has been adopted by AEEG.</li> </ol> <p>The certification of the energy savings produced by each project is made via the issuing of Energy Efficiency Certificates (EECs). There are three types of certificates depending on whether electricity, gas or another fuels was saved.</p> <p>EECs are tradable in a specific market organised by the AEEG and the Electricity Market Operator. They can also be traded over the counter. Three separate markets will exist for the different types of certificates and the banking of certificates is allowed.</p> <p>Distributors need to have sufficient EECs to demonstrate that they have met their annual target. Distributors who turn out to be non compliant are subject to penalties. Sanctions for non compliance need to be proportional and in any case greater than the investment needed to compensate the non compliance. Under certain conditions a 2 year grace period may exist. Sanction funds will be put in a fund used to finance information and training programmes.</p>
<b>Purpose</b>	Assist Italy in meeting Kyoto targets and with Security of Supply.
<b>Operating Dates</b>	Started in January 2005 and is ongoing.
<b>Eligibility Requirements</b>	Compulsory for all large distributors.
<b>Type, size and number of customers targeted</b>	All customers.

<b>Savings</b>	In 2005 Distributors needed to save 155,000 tons of oil equivalent.
<b>Role of Market Actors</b>	Other companies can obtain Certificates and sell to distributors. In 2005 over 400 Energy Services Companies were accredited to obtain certificates. GME have set its own electronic platform for trading certificates.
<b>Costs</b>	Not Known.
<b>Benefits to participants</b>	Compulsory. Helps meet targets or creates certificates that can be sold.
<b>Take up of the Programme</b>	Compulsory A Joint press release by GME and AEEG noted that the Authority had received over 350 requests to verify savings from over a 1000 projects. About half of these were done directly by distributors with the rest done by an Energy Service Company.
<b>Key Barriers</b>	Projects need to meet criteria set by AEEG.
<b>Marketing Strategies</b>	Compulsory.
<b>Contact Information</b>	<a href="http://www.autorita.energia.it">www.autorita.energia.it</a>

### 7.2.5 Voluntary Agreements on Energy Efficiency in Trade and Industry (Denmark)

<b>Programme Name</b>	Voluntary Agreements on Energy Efficiency in Trade and Industry.
<b>Sponsoring Organisation</b>	Danish Energy Authority (DEA).
<b>Description of the Programme</b>	<p>The Voluntary Agreements (VA) scheme was launched in 1996 as part of a package of Green taxes, subsidies (now removed) and Voluntary Agreements. The scheme mainly targets energy intensive industries that are given the potential to enter VA with the Danish Energy Authority and in return receive a CO<sub>2</sub> rebate. These voluntary agreements last for three years and customers can either enter them individually or as a group.</p> <p>The CO<sub>2</sub> taxes and VA are differentiated between heavy processes, light processes and space heating. Companies with light processes can only enter a VA if the company's tax on energy use exceeds 4% of the company's value added.</p> <p>The VAs contain a number of elements</p> <ul style="list-style-type: none"> <li>• An energy management system (EMS) – compulsory for a VA and there is a Danish standards for an EMS (DS 2403)</li> <li>• An energy flow screening – focused on the most energy intensive part of the process to identify areas relevant for further investigation</li> <li>• Special investigation to identify energy saving project. These now focus on the core processes of the company. In the case of a collective agreement the special investigation are coordinated between companies.</li> <li>• Energy Saving projects – All profitable energy saving projects identified in the special investigation need to be carried out. Profitable projects means having a payback of less than 4 years for heavy processes and less than 6 years for light processes. This payback is calculated based on energy prices in the absence of an agreement.</li> </ul> <p>After applying for entering a VA the company has up to 10 months to finish the preparatory tasks.</p> <p>The emergence of the EU Emissions Trading Scheme is likely to lead to a removal of the CO<sub>2</sub> tax from the process energy to which the ETS applies.</p>
<b>Purpose</b>	<p>There were two main aims of the VAs namely:</p> <ol style="list-style-type: none"> <li>1) To encourage energy efficiency in industry in order to reduce the CO<sub>2</sub> emissions; and</li> <li>2) To ensure that the competitiveness of Danish industry is not weakened by increased green taxes.</li> </ol>
<b>Operating Dates</b>	In operation since 1996 although a revised scheme came into force in July 2002.
<b>Eligibility Requirements</b>	All companies with heavy processes are eligible to enter a VA. Heavy processes include greenhouse heating, sugar, paper cement and glass. Companies with light processes can enter a VA if the company's tax on energy use exceeds 4% of the company value added. This includes energy used for space heating.
<b>Type, size and number of customers targeted</b>	All customer with relatively high energy usage.

<b>Savings</b>	The net impact of the VAs was estimated in an evaluation in 2005. These calculations were based only on an investigation of 27 companies. The impact of the latest scheme was estimated at 312GWh p/a between 2000-2003. This equates to a reduction of energy used of 1.9% p/a.
<b>Role of Market Actors</b>	None
<b>Costs</b>	The administrative costs have decreased significantly from 4 million € p/a in 1996 to about 0.4m € p/a for 2005.  Participant costs will be user specific depending on the energy saving investments required. The user costs have been significantly decreased by the removal of the compulsory energy audit which was replaced by an energy flow screening requirement.
<b>Benefits to participants</b>	The main benefits to participants are the CO <sub>2</sub> tax rebates. For many large companies the CO <sub>2</sub> tax rebate is of such considerable size that the VAs are perceived as necessary rather than voluntary.  There are some companies for which energy efficiency and VAs are part of their green profiling. A few such companies on which the ETS apply have expressed an interest in keeping their VAs when the CO <sub>2</sub> tax is lifted from their process energy used.  Many companies attribute their energy savings to the fact that the VAs have put energy issues on the company agenda.
<b>Take up of the Programme</b>	In 2005 98% of the energy used in heavy processes was covered by VAs with the remaining 2% deliberately left outside for economic reasons.
<b>Key Barriers</b>	The take up rates suggest that there are few barriers to these programmes. Companies are well aware of how the VAs operate and good contacts have already been established with the DEA.
<b>Marketing Strategies</b>	Scheme is well known and established in Denmark so little marketing is needed. The size of the potential savings means that customers are keen to find out and participate in this programme.
<b>Contact Information</b>	Danish Energy Authority.

## Appendix B – KEMA’s DSM ASSYST™ Model

### DSM ASSYST™ Model Description

DSM ASSYST™ (Demand-Side Management Technology Assessment System) is a tool developed to assess the technical, economic and market potential of DSM technologies in the residential, commercial and industrial sectors. Based on user-specified information about base technologies, conservation technologies, load shapes, utility avoided costs, utility service rates, and economic parameters, DSM ASSYST yields numeric data for a variety of criteria. The user can then evaluate and compare technologies. DSM ASSYST allows the user to analyse each DSM technology in multiple combinations of building types, market segments, end uses, and vintages both individually and compared to other DSM technology options.

The current version of DSM ASSYST uses a combination of Microsoft Excel spreadsheets and Visual Basic (VB) programming software. All input and output data are stored in spreadsheets. The VB modules read input data from various spreadsheets, perform the various analyses, and store output results into spreadsheets.

There are three major VB analysis modules: Basic, Supply, and Penetration. The diagram provides an overview of the model process and key inputs. Each module is briefly described below.

#### Basic Module

In the Basic module, each technology is assessed individually by comparing it to a base case. Comparisons are made at a high degree of segmentation. The segmentation may include, but is not limited to sector, building type, end use, vintage and geographic area.

The Basic module reads four types of information, contained within four spreadsheet files. These files include:

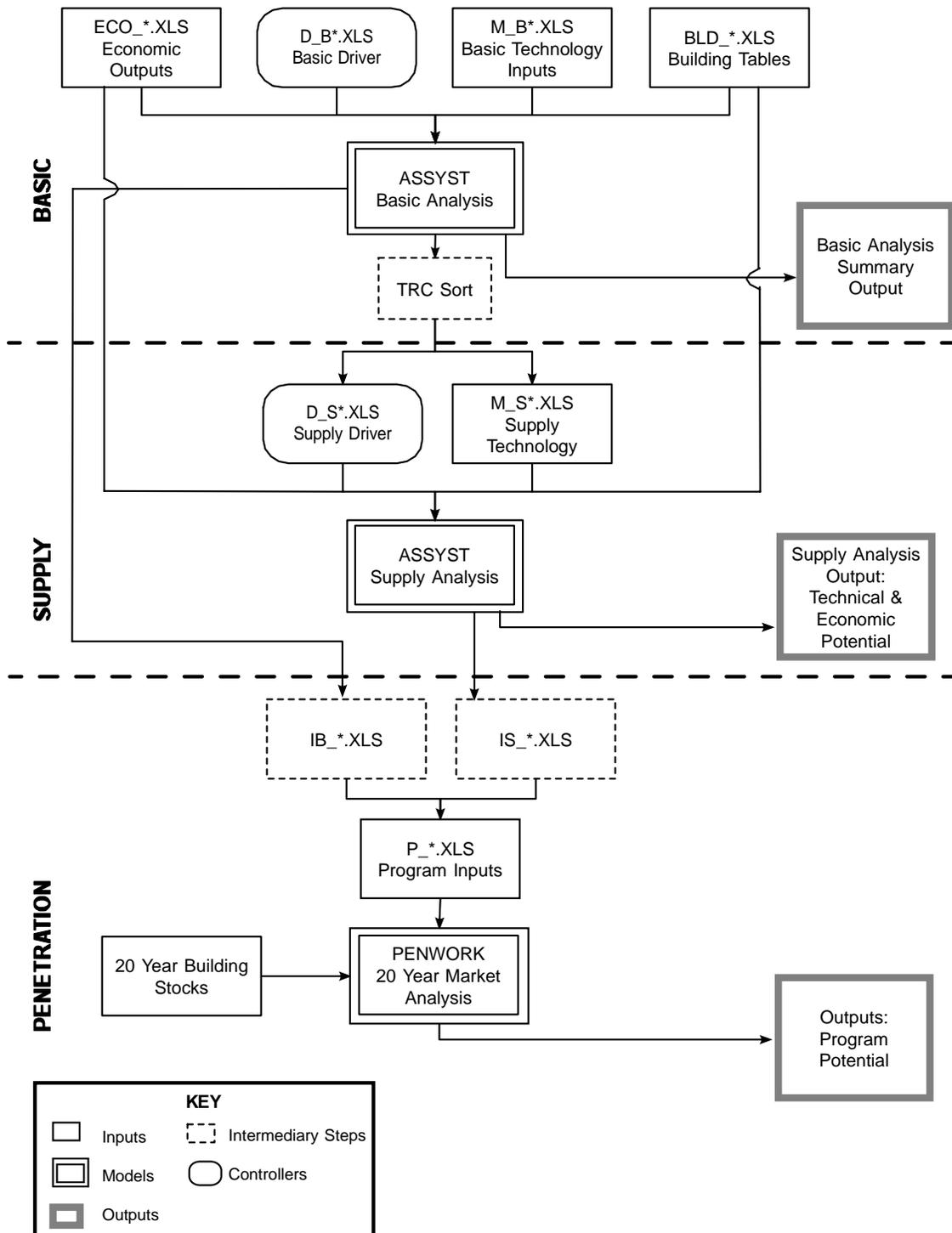
**Economic:** containing utility rates paid by customers, discount rates, avoided costs, and other utility-specific economic parameters;

**Building:** containing square footage or number of households and load shape data;

**Measure:** containing technology based inputs for the Basic Analysis; and

**Driver:** containing information that drives the analysis process.

### DSM ASSYST Analytic Flow



The output files produced by the Basic module include a summary basic output file that contains an assessment of how much energy and demand each technology will save relative to the base case within each segment. In addition, the summary contains cost data, savings fractions, before and after energy use intensities, service life, the levelised costs of implementing the technology and results of economic tests. These tests include the Total Resource Cost (TRC) test, Participant Test, and Customer Payback.

This module also produces a second file that contains all the measures that were assessed in the Basic Analysis sorted in the highest to lowest TRC order within each market segment and end use. This file serves as an input file for the Supply module.

## **Supply Module**

In the Supply Module each technology, within each market segment, is stacked, or implemented, such that all energy savings are realised from preceding technologies prior to the implementation of all subsequent technologies. The stacking order generally follows the TRC sort order, highest to lowest, resulting from the Basic module.

The Supply module requires two input files: a Driver file and a modified output file from the Basic module. As in the Basic module, the Driver file contains instructions for the analysis process. The output file from the basic analysis must be modified in Excel to address overlapping measures, such as different SEER levels or measures that are direct substitutes for each other.

Output from the Supply module contains the technical and economic potential plus energy and demand supply curves. The Supply module produces measure-level information that can be incorporated into the input file for the Penetration module

## **Penetration Module**

The Penetration (or Programme Potential) module of ASSYST is designed to calculate the costs and net energy and demand savings from DSM programmes under a variety of marketing scenarios. This module estimates the net impact and cost of a programme over time by forecasting the naturally occurring penetration of each measure as well as the penetration of each measure given the programme activities (i.e., incentives and awareness building).

Using a stock accounting algorithm over a period of 20 years, this module first calculates the number of customers for whom the measure will apply. Second, the model calculates the number of informed customers based on the amount of money spent on advertising. Third, the model calculates the number of customers who will implement the technology based on their benefit/cost ratio. Finally, the model compares the number of customers that implement the technology due to the programme with those who would take the technology anyway (naturally occurring). Per-unit energy and demand savings are applied to the net number of customers (total minus naturally occurring) over the 20-year period. After completing the analysis, the results are automatically summed across measures to provide programme-level costs and savings for 20 years.

A programme input file is used to define a programme and provide the building stock forecast. The programme characterisation variables include:

- Incentive Levels
- Incentive Budget Constraints
- Yearly Incentive Adjuster
- Technology Acceptance Curve Parameters
- Administration Budgets

- Advertising Budgets
- Awareness Decay Rate
- Target Effectiveness
- Advertising Effective Ratio.

## **Appendix C – Assumptions in the Modelling**

The modelling is predicated on a number of assumptions. A summary of these assumptions was provided in the main report. This appendix provides more detail these assumptions. It is split into the following sections:

- Economic Assumptions
- Building Stock Assumptions
- Measure Data
- Lifetime Data

### **Economic Assumptions**

As part of the modelling, assumptions have been made about the future trends of economic variables that will determine the value of energy benefits. Key assumptions that have been made are as follows:

- Electricity Price Forecast – This is split into two types of price forecast. An avoidable cost of generation and the retail cost to the consumer of power. The retail cost is used for the consumer economics (i.e. how they value savings) and the avoidable cost is used for the societal benefits costs test.
- Avoidable cost split into 2/3 periods per day and has a summer/winter split. The value of the power depends on whether it is the avoidable cost of generation or retail cost being considered
- Retail costs have been derived for 2007 from ESB published tariffs available in late 2006. Where more than one tariff exists then the model utilises an average, but the whole tariff is entered into the calculations to capture the different tariffs applying for each time periods. These prices were escalated for future years beyond 2007 by 2% p/a, reflecting the forecast of inflation.

### Indicative tariffs showing range of values

Customer Type	Tariff Used	Price
Residential	Urban Domestic Rural Domestic	Unit Rate Day - €0.14 KWh Unit Rate Night - €0.07 KWh
Commercial	General Purpose QH and NQH General Purpose (Nightsaver) MD Low Voltage Low Voltage Low Load Factor	Unit Rate varies different summer/winter, day/night and time of use blocks Night - €0.068 KWh Day time blocks up to €0.1867 KWh
Industrial	38 kV Medium Voltage	Unit Rate varies different summer/winter, day/night and time of use blocks Winter Night as low as €0.0659 KWh Summer Night as low as €0.0532 KWh Day time blocks up to €0.2999 KWh

- The avoidable costs of generation was based on the LOOP2 data produced by EirGrid and available as part of the All Island Project
- A central value of carbon of €20 tonne was used for the avoidable costs
- A capacity charge based on the best new entrant cost has also been included in the avoidable costs and spread over the winter peak hours. These peak hours were different for each customer type.
- The wholesale gas prices (avoided cost) have been produced from the price of wholesale gas prices at the UK NBP with additional transportation costs added to get the gas to Ireland. These UK prices came from a major UK Broker Spectron from early 2007. Prices per kWh including transmission costs but excluding local network costs were in the region of 1.4-2.0 c/kWh. All prices were inflated by 2% p/a after 2007 to account for inflation.
- The retail gas prices are derived from Bord Gáis Prices laid out in the CER Direction to Bord Gáis on Tariffs charged to Domestic and Small Commercial and Industrial Customers published on the 4<sup>th</sup> December 2006. The standard tariff for domestic customers was €4.09c/KWh with the cheapest industrial tariff at 3.389 c/KWh. The rate varied partly depended on the standing charge and average of these tariff charges was applied for the different customers segments of residential, commercial and industrial. These prices were increased each year by inflation.
- The retail heating oil prices were estimated from a number of regional prices using websites including irishfuelprice.com. The retail price was based on €0.53 per litre with the wholesale price estimated at €0.37 per litre.
- The cost of VAT was included for residential customer and excluded for business customers as it is assumed they will reclaim this cost.
- The benefit cost test was based on a 7.5% discount rate for the utility sector

- The discount rates used in the market penetration modules were 7.5% for Commercial and Industrial Sectors and 15 % for the residential sector.
- Economic growth was assumed to be 5.7% until 2010 and 2.4% from 2010 to 2020. These figures were agreed by Energy Policy Statistical Support Unit in early 2007.
- The inflation rate was assumed to be 2% p/a

Prices were forecast over the lifetime of the modelling period and by customer class.

### Building Stock Assumptions

Residential building stock was modelled using two building types – detached homes/bungalows and flats. Building stock data came from the Census of Housing. 2003<sup>11</sup> data was projected to 2007 to develop the base year number of housing units. The major end uses modelled were: space heating, space cooling, lighting, water heating and appliances. Usage data was derived from SEI data along with data on measures from the Department of Environment, Food and Rural Affairs (DEFRA) (UK).

The base year number of housing units are shown below:

	<b>Base Year</b>	<b>First Year Additions</b>
Detached/ Bungalows	745,043	21,256
Flats	717,229	64,220
Total	1,462,272	85,477

The following building types were modelled for the commercial sector:

- Offices
- Shops
- Education,
- Health
- Transport
- Warehouses
- Hotel and Catering
- Miscellaneous

<sup>11</sup> [http://www.cso.ie/releasespublications/pr\\_hseholds.htm](http://www.cso.ie/releasespublications/pr_hseholds.htm)

Commercial square meter data was derived from UK data from 1994 for average size per establishment and was allocated to Irish data using the number of establishments.

The major end uses for commercial were: Heating, ventilation, air conditioning and cooling (HVAC), lighting, cooking, refrigeration and office equipment. Historic usage by building type came from the Irish energy balance data and end use data was derived from this data.

The following industries were modelled:

- Rubber
- Food
- Mining
- Non metallic minerals
- Chemicals
- Textiles
- Paper
- Wood
- Paper
- Machinery
- Electrical
- Transport
- Other Manufacturing

The major end uses modelled were: lighting, pumps, motors, process, HVAC, refrigeration, and other. Historic usage data came from the Irish Energy Balance Spreadsheet and end use data was derived from this data and the 2003 Irish census of Industrial Production.<sup>12</sup>

## **Measure Data**

KEMA derived individual measure data from interviews with selected market actors in Ireland, data from the Department for Business, Enterprise and Regulatory Reform (UK), DEFRA (UK) and previous studies. The following data was collected: percentage energy savings, percent demand savings, lifetime, applicable square footage, awareness and other penetration curve parameters.

A partial sample of this data is shown below:

Sample Residential Existing Home:

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<sup>12</sup> Central Statistics Office, Stationary Office, Dublin, Ireland, Census of Industrial Production, 2003

## Residential Electric

Measure	Building Type	Total GWH	Total MW	GWh Savings	Total Energy Savings GWh	Percent GWh Savings	MW Savings	Total Capacity Savings MW	Percent MW Savings	Total Resource Cost Test TRC
Base Incandescent Bulb	Detached/Bungalow	1,196.94	152.24	0.00	0.00	0%	0.00	0.00	0%	N/A
CFL - 15w	Detached/Bungalow	665.31	84.62	531.63	531.63	44%	67.62	67.62	44%	10.22
Base Torchiere	Detached/Bungalow	131.57	16.73	0.00	0.00	0%	0.00	0.00	0%	N/A
CFL Torchiere - 55w	Detached/Bungalow	26.50	3.37	105.06	105.06	80%	13.36	13.36	80%	3.22
Base Fluorescent Fixture, 2L4T12, 40W, 1EEMAG	Detached/Bungalow	63.20	8.04	0.00	0.00	0%	0.00	0.00	0%	N/A
ROB 2L4T8, 1EB	Detached/Bungalow	46.15	5.87	17.05	17.05	27%	2.17	2.17	27%	3.26
RET 2L4T8, 1EB	Detached/Bungalow	33.70	4.29	12.45	29.50	47%	1.58	3.75	47%	2.38
Base Refrigerator/Freezer	Detached/Bungalow	478.43	55.34	0.00	0.00	0%	0.00	0.00	0%	N/A
Remove secondary refrigerator/freezer	Detached/Bungalow	419.64	48.54	58.79	58.79	12%	0.00	0.00	0%	2.07
HE Refrigerator/Freezer - A++ rated	Detached/Bungalow	222.29	25.71	197.35	256.14	54%	22.83	22.83	41%	0.85
Base Refrigerator	Detached/Bungalow	295.87	34.22	0.00	0.00	0%	0.00	0.00	0%	N/A
Remove secondary refrigerator	Detached/Bungalow	89.45	10.35	206.42	206.42	70%	0.00	0.00	0%	3.69
HE Refrigerator - A+ rated	Detached/Bungalow	60.35	6.98	29.09	235.52	80%	3.36	3.36	10%	0.33
Base Freezer	Detached/Bungalow	291.10	34.67	0.00	0.00	0%	0.00	0.00	0%	N/A
HE Freezer - A rated	Detached/Bungalow	247.72	29.50	43.38	43.38	15%	5.17	5.17	15%	9.85
HE Freezer - A+ rated	Detached/Bungalow	234.94	27.98	12.78	56.16	19%	1.52	6.69	19%	1.45
Remove secondary freezer	Detached/Bungalow	95.83	11.41	139.11	195.27	67%	0.00	6.69	19%	3.58
Base 40 gal. Water Heating (EF=0.88)	Detached/Bungalow	116.35	12.45	0.00	0.00	0%	0.00	0.00	0%	N/A
Pipe Wrap	Detached/Bungalow	113.13	12.10	3.22	3.22	3%	0.34	0.34	3%	4.82
Low Flow Showerhead	Detached/Bungalow	110.42	11.81	2.71	5.93	5%	0.29	0.63	5%	3.84
Faucet Aerators	Detached/Bungalow	108.76	11.63	1.66	7.59	7%	0.18	0.81	7%	2.86
HE Water Heater (EF=0.93)	Detached/Bungalow	106.79	11.42	1.98	9.56	8%	0.21	1.02	8%	1.21
Heat Pump Water Heater (EF=2.9)	Detached/Bungalow	92.09	9.85	14.69	24.26	21%	1.57	2.59	21%	1.14
Tankless Water Heater	Detached/Bungalow	90.25	9.65	1.84	26.10	22%	0.20	2.79	22%	1.03
Solar Water Heat	Detached/Bungalow	87.99	9.41	2.26	28.36	24%	0.24	3.03	24%	0.41
Timeclock for Circulation Pump	Detached/Bungalow	86.69	9.27	1.31	29.66	25%	0.14	3.17	25%	0.33
Base Clotheswasher (MEF=1.04)	Detached/Bungalow	32.27	4.16	0.00	0.00	0%	0.00	0.00	0%	N/A
HE Clotheswasher (MEF=1.42)	Detached/Bungalow	10.73	1.38	21.54	21.54	67%	2.77	2.77	67%	3.98
Ultra-HE Clotheswasher (MEF=1.8)	Detached/Bungalow	8.93	1.15	1.79	23.33	72%	0.23	3.00	72%	0.10
Base Dishwasher (EF=0.46)	Detached/Bungalow	9.79	1.04	0.00	0.00	0%	0.00	0.00	0%	N/A
HE Dishwasher (EF=0.58)	Detached/Bungalow	9.35	0.99	0.44	0.44	4%	0.05	0.05	4%	1.49

RESIDENTIAL OIL (EXISTING)									
Measure	Building Type	Total Therms	Total Therms/Day	Therms Savings	Total Energy Savings Therms	Percent Therms Savings	Therms/Day Savings	Total Capacity Savings Therms/Day	Total Resource Cost Test TRC
Base Furnace, 80 AFUE, 80 kbtu	Detached/Bungalow	154,852,227	335,878	0	0	0%	0	0	N/A
Ceiling R-0 to R-19 Insulation Blown-in (.71)	Detached/Bungalow	141,768,787	307,500	13,083,440	13,083,440	8%	28,378	28,378	11.51
Programmable Thermostat (.6)	Detached/Bungalow	138,133,690	299,615	3,635,097	16,718,537	11%	7,885	36,263	5.41
Duct Insulation (.6)	Detached/Bungalow	134,898,588	292,598	3,235,101	19,953,638	13%	7,017	43,280	4.91
Basic HVAC Diagnostic Testing And Repair	Detached/Bungalow	130,547,021	283,159	4,351,567	24,305,206	16%	9,439	52,719	4.39
Wall 2x4 R-0 to Blow-In R-13 Insulation (.86)	Detached/Bungalow	105,787,886	229,456	24,759,135	49,064,341	32%	53,703	106,422	3.15
Duct Repair (0.68)	Detached/Bungalow	97,237,257	210,910	8,550,629	57,614,970	37%	18,546	124,968	2.31
Condensing Furnace, 92 AFUE	Detached/Bungalow	86,249,875	187,078	10,987,382	68,602,351	44%	23,832	148,800	0.79
Floor R-0 to R-19 Insulation-Batts	Detached/Bungalow	81,643,541	177,087	4,606,334	73,208,686	47%	9,991	158,791	0.88
Infiltration Reduction (.6)	Detached/Bungalow	80,645,860	174,923	997,681	74,206,366	48%	2,164	160,955	0.62
Base 40 gal. Water Heating (EF=0.60)	Detached/Bungalow	79,634,965	144,453	0	0	0%	0	0	N/A
Water Heater Blanket	Detached/Bungalow	75,428,997	136,823	4,205,968	4,205,968	5%	7,629	7,629	30.27
Pipe Wrap	Detached/Bungalow	74,520,214	135,175	908,783	5,114,751	6%	1,648	9,278	14.83
Low Flow Showerhead	Detached/Bungalow	72,839,086	132,126	1,681,129	6,795,880	9%	3,049	12,327	8.78

Measure	Building Type	Total GWH	Total MW	GWh Savings	Total Energy Savings GWh	Percent GWh Savings	MW Savings	Total Capacity Savings MW	Percent MW Savings	Total Resource Cost Test TRC
COMMERCIAL ELECTRIC (EXISTING)										
Base Fluorescent Fixture, 4L4T12, 34W, 2EEMAG	Offices	131.70	39.23	0.00	0.00	0%	0.00	0.00	0%	N/A
Lighting Control Tuneup	Offices	131.02	39.02	0.68	0.68	1%	0.20	0.20	1%	32.57
RET 2L4' Premium T8, 1EB, Reflector	Offices	105.19	31.33	25.83	26.51	20%	7.69	7.90	20%	36.38
RET 4L4' Premium T8, 1EB	Offices	82.87	24.68	22.32	48.83	37%	6.65	14.54	37%	44.36
Occupancy Sensor, 4L4' Fluorescent Fixtures	Offices	73.53	21.90	9.34	58.18	44%	2.78	17.33	44%	6.40
Continuous Dimming, 5L4' Fluorescent Fixtures	Offices	51.47	15.33	22.06	80.23	61%	6.57	23.90	61%	1.82
Base Fluorescent Fixture, 2L4T12, 34W, 1EEMAG	Offices	116.37	34.66	0.00	0.00	0%	0.00	0.00	0%	N/A
Lighting Control Tuneup	Offices	115.76	34.48	0.60	0.60	1%	0.18	0.18	1%	32.57
RET 1L4' Premium T8, 1EB, Reflector OEM	Offices	108.32	32.26	7.44	8.05	7%	2.22	2.40	7%	16.48
Occupancy Sensor, 8L4' Fluorescent Fixtures	Offices	96.11	28.63	12.21	20.26	17%	3.64	6.03	17%	9.47
RET 2L4' Premium T8, 1EB	Offices	69.89	20.82	26.22	46.48	40%	7.81	13.84	40%	16.68
Continuous Dimming, 10L4' Fluorescent Fixtures	Offices	48.92	14.57	20.97	67.44	58%	6.25	20.09	58%	1.99
Base Fluorescent Fixture, 2L8T12, 60W, 1EEMAG	Offices	10.76	3.21	0.00	0.00	0%	0.00	0.00	0%	N/A
RET 2 - 1L4' Premium T8, 1EB, Reflector OEM	Offices	8.71	2.60	2.05	2.05	19%	0.61	0.61	19%	16.38
Occupancy Sensor, 4L8' Fluorescent Fixtures	Offices	7.73	2.30	0.98	3.03	28%	0.29	0.90	28%	7.04
RET 2 - 2L4' Premium T8, 1EB	Offices	6.33	1.89	1.40	4.43	41%	0.42	1.32	41%	14.69
Continuous Dimming, 5L8' Fluorescent Fixtures	Offices	4.43	1.32	1.90	6.33	59%	0.57	1.88	59%	1.72
Base Incandescent Flood, 75W to Screw-in CFL	Offices	66.46	19.79	0.00	0.00	0%	0.00	0.00	0%	N/A
CFL Screw-in 18W	Offices	49.22	14.66	17.24	17.24	26%	5.13	5.13	26%	21.12
Base Incandescent Flood, 75W to Hardwired CFL	Offices	22.15	6.60	0.00	0.00	0%	0.00	0.00	0%	N/A
CFL Hardwired, Modular 18W	Offices	16.41	4.89	5.75	5.75	26%	1.71	1.71	26%	6.94
Base High Bay Metal Halide, 400W	Offices	50.58	15.07	0.00	0.00	0%	0.00	0.00	0%	N/A
High Bay T5	Offices	32.28	9.62	18.29	18.29	36%	5.45	5.45	36%	11.39
Base 4L4T8, 1EB	Offices	196.53	58.54	0.00	0.00	0%	0.00	0.00	0%	N/A

## Lifetime data

A number of technical assumptions had to be made to determine the quantity of energy that would be saved by the introduction of measures.

The key area of debate has been the lifetime of the individual measures. Primarily these have been derived from KEMA's database of energy efficient resources. However, the EU is producing standard lifetimes for the calculation of savings measures towards the Energy Services Directive target. Within the EU Energy Service Directive there are a number of example lifetimes of measures and whilst these lifetimes are still to be agreed it was felt appropriate to use the figures that are currently included within the Directive. The approach has been to identify where such figures vary significantly from those in the KEMA database and comment on the variation.

### Example Measure Life in the Energy Services Directive

Measure	Lifetime
Loft Insulation of Private Dwellings	30 years
Cavity Wall Insulation of Private Dwellings	40 years
Glazing E to C rated (in m2)	20 years
Boilers B to A rated	15 years
Heating controls – Upgrade with boiler replacement	15 years
CFLs - retail	16 years

The lifetime figures for lighting seemed high in comparison with KEMA's international experience and the expectation of some members of the DSM Advisory Group.

The savings available from each fuel are also impacted by the degree to which each fuel is used for space heating and water heating. KEMA have used the following figures as a guide to the existing penetration of the different fuels for residential space and water heating.

**Table 1-1**  
**Penetration of Space and Water Heating**

<b>Fuel</b>	<b>Space Heating</b>	<b>Water Heating</b>
Electricity	10%	30%
Gas	35%	30%
Oil	40%	30%
Other	15%	10%

Saturation levels of the key appliances and current levels of insulation were the final major items impacting, particularly on residential potential. Estimates of these saturation levels were derived from a mixture of Irish and UK data and discussed with the DSM Advisory Group in order to reach agreed assumptions to be used in the modelling. Prices for each of these measures, including the incremental costs based on the reference non energy-efficient product, were where possible calculated from Irish price data from a variety of sources.

## **Appendix D – Indicative Programme Designs for Ireland**

This appendix presents the detailed programme design templates for the recommended programmes. It also includes the budgets for these programmes and presents programme designs for two load control pilot programmes. These are purely indicative and meant as starting points for further examination.

# **1. Residential Programmes**

## **1. Introduction**

In the design of suitable programmes for Ireland it is essential to consider lessons from the best practice designs that have evolved. Three of the key best practice recommendations were to have participation strategies that were multi pronged and inclusive, to keep programmes stable over time and to have a single point of contact. To achieve these it is recommended that the programmes are broad ranging and may include a number of related initiatives that work together to deliver the energy efficiency savings or peak load reduction required in Ireland.

In addition to the potential from these programmes, there are significant savings from the introduction of changes to the building regulations which increase the efficiency of the building stock. These building regulation changes have meant that there is a lower emphasis on residential new construction programmes than is typically seen in the design of DSM programmes.

### **1.1 Recommended Residential Programmes**

The recommended business programmes built on the lessons from international programmes. These suggested that lighting and insulation will be the largest areas of opportunity, that mandatory standards can be used to increase efficiency but incentives are still required and that there is a need to increase awareness of energy saving opportunities. Based on this analysis the following four programmes are recommended for implementation in Ireland:

- Residential On-line Audits
- Lighting and Appliances ( Efficient Products)
- Weatherization and Air Sealing programme (Residential Retrofit)
- Residential New Construction (in addition to the new building regulations)

Detailed programme designs are presented below:

## 1.2 Residential On-line Audit Programme

<b>Programme Objectives</b>	The residential on-line audit programme's objective is to provide an education-based customer service for those customers who are interested in learning more about how to save energy in their home. This would be an expansion of the existing on-line tools including the Power of One Campaign and the Home Energy Survey. The audit would cover all fuels.
<b>Programme Theory or Market Barriers and Approaches to Overcome Them</b>	<p>Audit programmes have been a staple at utilities since the 1970s. The theory of an audit programme is to provide a customer service visit and technical assistance to customers. The service helps educate customers about how they can save energy in their own home.</p> <p>The programme's most significant market barriers include:</p> <ul style="list-style-type: none"> <li>• Low response to broad market offers;</li> <li>• Challenge of motivating customers to implement recommended measures; and</li> <li>• Valuing the energy savings achieved as a result of the programme.</li> </ul> <p>In order to help overcome these barriers, the programme approach includes targeted marketing, revised reporting tools to help streamline the process and more clearly indicated savings opportunities for customers. The programme should consider evaluation efforts to permit some energy savings to be attributed to the programme.</p>
<b>Programme Description</b>	The on-line audit will exist on the programme administrator's web site and will be promoted to customers via bill inserts of electricity and gas suppliers. The audit will allow consumers to estimate their usage by end use and identify savings measures to save energy in their home. The audit would also provide linkages to other proposed programmes such as the lighting and the weatherization programmes.
<b>Existing Programmes</b>	The Power of One programme would be complimentary in assisting customers to understand the energy efficiency actions they could take. The home energy survey details many of the improvements that could be made, but not tailored for the individual premise. The audit could use much of the information provided as part of the home energy survey.
<b>Target Market</b>	The audit programme will be available to all Irish residential customers. The audit programme will be highlighted on the programme administrator's web site with links from suppliers' websites
<b>Eligible Measures</b>	There are no specific eligibility measures for the audit programme. However, the audit focuses on a whole house assessment of energy use and provides recommendations on weatherization, major home equipment and appliances.

<b>Implementation Strategy</b>	<p>The trend in audit programmes has been away from more expensive on-site surveys to less costly and more broadly accessible online or direct mail surveys. An evaluation of implementation costs that Southern California Edison performed in 2002-2003 indicated that their audit services cost \$91 for on-sites, \$36 for phone, \$25 for direct mail, and \$2 for online.</p> <p>A software based audit would include the following key programme design steps:</p> <ul style="list-style-type: none"> <li>• Identify potential software solutions;</li> <li>• Evaluate an implementation strategy (in-house versus outsourced);</li> <li>• Customise chosen software to include Ireland specific values and create recommendations that highlight other Irish programmes;</li> <li>• Create new onsite forms using the new software and integrate onsite and other delivery mechanisms; and</li> <li>• Promote the new on line audit services more heavily.</li> </ul>
<b>Marketing Strategy</b>	<p>The programme administrator would market the audit programme through supplier bill inserts that promote the service as a way to conserve energy. It could also be promoted with direct mail and via e-mail.</p>
<b>Staffing/ Implementation Strategy</b>	<p>This would require ½ an FTE to administer along with the Residential Retrofit programme.</p>
<b>Budget</b>	<p>The budget of this programme would be not be included as a separate programme budget, but instead would be part of the administrative costs supporting the other residential programmes.</p>
<b>Quality Control</b>	<p>Residential audits, regardless of their delivery mechanism, should have savings recommendations that are customised to the participant’s specific home and habits. Recommendation calculations and the resulting savings presented to customers should be reviewed periodically to ensure they are accurate. Recommendations should appropriately point customers to grants or other incentives that might help reduce measure costs.</p>
<b>Performance Metrics</b>	<p>The programme administrator should ensure that tracking systems are set up to maximise the value of the information collected during an energy audit.</p> <p>Key performance metrics to track include:</p> <ul style="list-style-type: none"> <li>• Number of hits on web site;</li> <li>• Number of completed audits;</li> <li>• Number of measures recommended;</li> <li>• Savings potential of recommended measures; and</li> <li>• Customers available for follow-up marketing of other programmes.</li> </ul>
<b>Proposed Evaluation Procedures and Schedule</b>	<p>This programme will not produce measurable energy savings. Customer satisfaction should be monitored via a survey in the first 18 months.</p>
<b>Coordination with Other Programmes/ Agencies</b>	<p>Residential audits offer an opportunity to cross-sell services to customers. Customer recommendations should include details on both the lighting and</p>

	the weatherization programmes that are available.
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### 1.3 Residential Retrofit

<b>Programme Objective</b>	The objective of the Residential Retrofit programme is to reduce energy use in homes. Opportunities would be identified by an in-home audit. The contractors providing the audit would then provide the appropriate measures with a customer contribution of 25 -50 percent. Measures would include air sealing, insulation, set back thermostats, water heater blankets, CFL's, appliance removal and heating system upgrades where appropriate. Services would be provided to fuel poor customers at no customer cost.
<b>Programme Theory or Market Barriers and Approaches to Overcome Them</b>	<p>The programme offsets excessively high energy costs by reducing energy.</p> <p>The programme's most significant market barriers include:</p> <ul style="list-style-type: none"> <li>• Lack of knowledge about the measures; and</li> <li>• Lack of capital to install the measures.</li> </ul> <p>In order to overcome these barriers, the programme will incorporate customer education, provide training and networking opportunities for the auditors and provide funding for measures.</p>
<b>Programme Description</b>	An audit will be provided to customers who request an audit. The audit will identify all energy saving measures that exist for the customer. The contractors providing the audit would then provide the appropriate measures with a customer contribution of 25- 50 percent. Measures would include air sealing, insulation, set back thermostats, water heater blankets, CFL's, and towel rack timers. The customer contribution would be waived for low income customers.
<b>Existing Programmes</b>	The Warmer Homes programme provides a similar range of measures to low income customers. This programme could continue and be used for the targeting of higher levels of discount for the fuel poor with a wider programme then focusing on all other customers.
<b>Target Market</b>	<p>All Irish residential customers with internal heating systems are eligible for the programme.</p> <p>Low income / Fuel poor areas should be targeted for installation in the first years of the programme.</p>
<b>Eligible Measures</b>	<p>The programme's primary measures will be:</p> <ul style="list-style-type: none"> <li>• Insulation;</li> <li>• Programmable thermostats;</li> <li>• CFL's including fixtures;</li> <li>• Air sealing;</li> <li>• Selected appliance replacement; and</li> </ul>

	<ul style="list-style-type: none"> <li>• Water heater blankets.</li> </ul>
<b>Implementation Strategy</b>	The programme would be administered by a vendor. The vendor would conduct the audits and install the measures or subcontract the installation of the measures. It is suggested that this programme is started as a pilot.
<b>Marketing Strategy</b>	Direct mail should be used for the majority of lead generation activity. The programme administrator could also work with the distributors or retailers to include it in their bill stuffers and to add to their web sites.
<b>Incentive Strategy</b>	It is recommended that a 25- 50 % customer contribution should be required for measures to be installed for non fuel poor customers. For fuel poor customers it is recommended that the full cost of the measures be covered by the programmed.
<b>Staffing/ Implementation Strategy</b>	The programme administrator should have at least a 0.5 FTE programme manager for this programme with an appropriate level of support staff. The vendor should be selected through an RFP process.
<b>Quality Control</b>	In the initial programme year there should be significant quality control of the in-home installations to ensure quality. In future years a sample of homes should be reviewed by a quality control vendor.
<b>Estimated Budgets</b>	The overall estimated programme budget this programme is combined with lighting and appliances and is presented in Section 3.
<b>Savings</b>	Savings are provided in Section 3.
<b>Milestones</b>	RFP Vendor (s) selected Initial programme pilot
<b>Cost Effectiveness Assessment</b>	The Total Resource Cost Test Ratio (TRC) for the programme ranges from 4.7 - 11 depending on the fuel.
<b>Coordination with other Programmes/ Alternative programmes designs</b>	This programme could also be implemented as means to meet the requirements of a certificate programme. The programme could also be supported by a loan programme to cover the cost of the measures not covered by incentives. It also could be implemented along with a home rating scheme.
<b>Proposed Evaluation Procedures and Schedule</b>	This programme should have process evaluation and an impact evaluation within the first 18 months of operation. The process evaluation should include a customer survey and staff and vendor interviews. Billing Analysis should be used for the Impact analysis.

## 1.4 Lighting and Appliances Programme

<p><b>Programme Objective</b></p>	<p>The objective of the programme is to increase the number of installed energy efficient lights and appliances in Ireland. The programme offers financial incentives to residential customers or homebuilders who install measures that meet programme requirements. Customers can receive rebates<sup>13</sup> for retrofit or new construction homes with slightly different requirements depending on the measure and its application. Applicable measures include a variety of energy efficient measures. As the programme evolves the programme administrator may add new measures or upgrade qualification requirements to reflect changing market conditions. In addition, the programme administrator may transition some portion of the rebates in future years from a direct customer rebate to a retailer discount or other upstream effort.</p>
<p><b>Programme Theory or Market Barriers and Approaches to Overcome Them</b></p>	<p>Rebate programmes have been a mainstay of residential energy efficiency programmes since the earliest days of demand-side management (DSM). As efficiency standards have increased, rebate programmes have tried to stay several steps ahead of current codes and standards to help promote further efficiency improvements. While rebate programmes still play an important role in creating efficiency improvements, programmes often incorporate more training and coordination with market actors than in the early years of rebate programmes.</p> <p>The market barriers in the residential energy efficient lighting market include:</p> <ul style="list-style-type: none"> <li>• Information and search costs;</li> <li>• Product unavailability;</li> <li>• Higher initial product cost; and</li> <li>• Undervaluation of the energy efficiency cost benefits.</li> </ul> <p>In order to help overcome these barriers, the rebate programme will provide:</p> <ul style="list-style-type: none"> <li>• Information about qualifying products that helps customers gather enough information to make a more informed decision;</li> <li>• Market actor education to alert the marketplace of the equipment sizing criteria, programme requirements, application procedures, and rebates offered;</li> <li>• Coordination with retailers to raise awareness of energy efficiency products, help encourage increased stocking of efficient products, and explain the rebate programme details and applicable equipment;</li> </ul>

<sup>13</sup> Rebates could be in the form of discount vouchers redeemable at shops or with contractors

<p><b>Programme Theory or Market Barriers and Approaches to Overcome Them (cont.)</b></p>	<ul style="list-style-type: none"> <li>• Rebates to help reduce the incremental cost of higher first cost equipment. Over time, as other market transformation strategies begin to take effect, efficiency levels and practices become more commonplace, and incremental costs decline, the rebates can be reduced or shifted to new products and practices; and</li> <li>• Periodic assessment of product availability to determine ways that the programme education and marketing should adapt to insure that availability increases over time.</li> </ul>
<p><b>Programme Description</b></p>	<p>The programme is a rebate programme that provides a full range of rebate offers. The programme will begin with a portfolio of efficiency lighting rebates and add to or adjust those as appropriate to help influence the marketplace. The programme administrator will oversee the programme and administer much of the market coordination services, but may decide to subcontract rebate processing services and programme setup assistance to third party provider(s).</p> <p>Marketing and educational materials will clearly define the products that are available for rebates as well as any programme requirements. While all measures will be added as the programme develops, the first year or two of the programme may limit the focus to a portion of the measures. The list of measures that are targeted to be available under the rebate programme is included in the eligible measures section below.</p> <p>The programme will include retailer coordination, and ongoing trade-ally efforts. The rebates will be offered on a year-to-year basis with a qualifying annual pool of funds available for rebates. If the funding pool is used up prior to the end of the year, the rebates can be deferred to the following programme year assuming funding is still available.</p> <p>One of the keys to success in a rebate programme of this magnitude and diversity is to have a detailed tracking system to allow customers to request programme information and apply for rebates online. Ongoing tracking of programme targets, achievements, and funding must be done real-time to permit programme administration as well.</p>
<p><b>Existing Programme</b></p>	<p>The Energy Labelling programme has helped to promote energy efficient appliances and introduced minimum standards, but does not provide any financial incentives.</p> <p>The Warmer Homes programme provides some support for energy efficient appliances such as CFLs, but this is targeted only at a small number of customers.</p> <p>The Power of One programme would be complimentary in assisting customers to understand the energy efficiency actions they could take.</p>

<b>Target Market</b>	The rebate programme is available to all residential customers. Rebates can also be paid to landlords for multi-family system improvements or to builders, developers, or new home buyers for new construction improvements.
<b>Eligible Measures</b>	<p>The list of potential eligible measures below are:</p> <ul style="list-style-type: none"> <li>• Lighting Retrofits: Compact Fluorescent Bulbs, Fluorescent Torchieres, and CFL fixtures</li> </ul> <p>The programme will also promote over time with selected rebates:</p> <ul style="list-style-type: none"> <li>• High efficiency washing machines;</li> <li>• High efficiency refrigerators;</li> <li>• High efficiency freezers;</li> <li>• High efficiency dishwashers;</li> <li>• High efficiency water heaters;</li> <li>• Programmable thermostats;</li> <li>• Room air conditioners;</li> <li>• High efficiency central conditioners;</li> <li>• Ceiling fans; and</li> <li>• High performance windows.</li> </ul>
<b>Implementation Strategy</b>	As the programme evolves over time, it is critical to keep several best practice findings at the core of the programme effort. First, the programme must be easy for customers to use. A simplified process must be maintained to ensure customer acceptance and ongoing processing efficiency. Second, coordination with market actors is an ongoing process and must continue after programme launch. The programme administrator will need to continue to work with contractors, suppliers, retailers, and other market actors to not only keep assessing the market conditions and programme induced changes, but also to continue to market the programme to these important players. Lastly, the programme must continue to educate and inform customers about the programme offerings, participation requirements, and advantages of using more energy efficient equipment. The programme is an ongoing education process and must be staffed and continually developed to ensure ongoing market transformation.

<p><b>Marketing Strategy</b></p>	<p>The rebate programme should leverage existing energy efficiency information as much as possible and practical. The programme administrator should market the programme through all existing electricity supplier marketing channels such as bill inserts, bill messages, consumer advertising, customer education campaigns, and the programme administrator’s web site. The full programme launch should be coupled with press releases, retailer signage, information displays, and special education events.</p> <p>For the first two years of the programme, marketing efforts should be fairly high level with a focus on broad markets and messages. The programme administrator should then use the results from the first two programme years to develop a more targeted marketing campaign that helps to capture market in areas underserved by the programme. In addition, as the programme administrator tracks the participation rates to various programme measures we suggest that they develop more targeted marketing campaigns to help push measures that might not be as accepted and need further customer education or other market transformation efforts.</p> <p>The programme administrator should monitor rebate levels closely as the programme matures. There is a natural progression of efficiency in the market and rebate qualifications should be adjusted as appropriate to accommodate market changes. Ideally, as the market for efficient products expands, prices will naturally decline so that individual measure rebates could possibly be decreased over the course of the programme.</p>
<p><b>Incentive Strategy</b></p>	<p>Rebates offer customers a financial incentive to help reduce their first cost when they purchase more efficient equipment. The rebate programme must create rebate levels that are high enough to foster market interest, but that do not overpay for efficiency. A rebate of 50-75 % of the cost for lighting is suggested.</p> <p>While direct upstream buy-downs are not recommended initially, the programme administrator may want to consider transitioning to these higher-level rebate methods as the programme progresses.</p>
<p><b>Staffing/ Implementation Strategy</b></p>	<p>In order to oversee this large residential programme, the programme administrator should have a dedicated project manager assigned to the programme. The manager should be assisted by at least one full time administrative assistant.</p>

<b>Performance Metrics</b>	<p>The programme administrator should have a regular programme summary report at a minimum quarterly, but preferably by month. The summary report should include both monthly and programme year totals. With an internet based application system, the report can be created and viewed online. The summary report will provide an overview of various programme metrics. The rebate programme project manager should also provide a regular commentary on successes, failures, and steps underway to improve the programme. Programme metrics should include:</p> <ul style="list-style-type: none"> <li>• Summary of campaigns ;</li> <li>• Application requests;</li> <li>• Applications submitted (by measure type, housing type, and by customer);</li> <li>• Applications approved;</li> <li>• Applications disapproved (by problem type);</li> <li>• Rebates paid;</li> <li>• Rebates in queue;</li> <li>• Rebate funds remaining (by measure type if applicable);</li> <li>• Savings attributed to rebates (by measure type, housing type, and customer);</li> <li>• Customer calls;</li> <li>• Customer complaints; and</li> <li>• Customer questions.</li> </ul>
<b>Quality Control</b>	<p>Quality control is an important means of ensuring that rebates are provided appropriately. As noted previously, an internet based application process should include quality control steps as part of the application so that any errors can be highlighted prior to submission. For example, automated quality control steps should check that customers provide their utility account number in the correct format, that multiple rebates are added up correctly, that customers are aware of all of the materials that they need to submit with their application, and so forth. Of course, there will always be a manual element to the application process as staff inspects submissions to insure that materials are correct and that requested rebates are reasonable.</p>
<b>Estimated Budgets</b>	<p>The overall estimated programme budget for residential rebate programmes is combined with the residential retrofit programme and is presented in Section 3.</p>

<b>Savings</b>	Savings are presented in Section 3.
<b>Milestones</b>	RFP Vendor (s) selected Programme launch
<b>Cost Effectiveness Assessment</b>	The TRC Test Ratio (TRC) for the programme ranges from 4.7 -11 depending on the fuel.
<b>Proposed Evaluation Procedures and Schedule</b>	This programme should have process evaluation within the fist 18 months of operation. The process evaluation should include a customer survey, mystery shopping and staff and vendor interviews. The survey would also collect the

parameters such as hours of use, numbers of bulbs etc that could be used to review the estimated impacts of the programme.

## 1.5 Residential All Fuels New Construction Programme

The new construction programmes will by necessity be linked to the proposed regulation change for new buildings. As discussed in the main report, KEMA made assumptions about the impact of the proposed 2008 building regulation changes. Based on this analysis, we found that an all fuels residential new construction was still cost effective. Our recommendation is that this programme commences after the regulations are implemented so that the new building regulations are used as the baseline for future savings. It is highly recommended that the programme administrator conduct market baselines of new construction practices as the regulations develop.

<b>Programme Objective</b>	The objective of this programme is to reduce energy use in new homes above the proposed building regulations. This programme would be promoted to new home builders. This programme would also serve to educate builders on the scope and content of the new building regulations.
<b>Programme Theory or Market Barriers and Approaches to Overcome Them</b>	<p>The programme offsets energy costs by reducing energy in new buildings. It would build off the new building regulations.</p> <p>The programme's most significant market barriers include:</p> <ul style="list-style-type: none"> <li>• Lack of knowledge about the new building regulations;</li> <li>• Lack of knowledge about the measures; and</li> <li>• Lack of lack of capital to install the measures.</li> </ul> <p>In order to overcome these barriers, the programme will incorporate customer and builder education, provide training and networking opportunities for the builders, and provide funding for measures.</p>
<b>Programme Description</b>	<p>This programme will identify measures and actions that will allow builders to exceed the new building regulations. The programme will provide education about the new building regulations and the ways to meet them as well as exceed them. The incentives in this programme will be for builders. The incentives should be on both a whole home basis and where appropriate for specific measures.</p> <p>The programme administrator may choose to allow measures such as solar hot water heating, roof top PV systems, and other small renewables that did not pass the total resource cost effectiveness test.</p>
<b>Existing Programmes</b>	House of Tomorrow programme is similar.
<b>Target Market</b>	All residential new homes
<b>Eligible Measures</b>	<p>The programme's primary measures will most likely be:</p> <ul style="list-style-type: none"> <li>• Windows;</li> <li>• Solar hot water heating;</li> <li>• Additional air sealing;</li> <li>• Advanced boilers;</li> </ul>

	<ul style="list-style-type: none"> <li>• Appliances;</li> <li>• Lighting; and</li> <li>• PV systems.</li> </ul> <p>This programme will be closely tied to the new building regulations.</p>
<b>Implementation Strategy</b>	The programme would be administered by a vendor. The vendor would market to the builders and certify the savings. It is suggested that this programme is started as a pilot
<b>Marketing Strategy</b>	The vendor would determine the marketing strategy.
<b>Incentive Strategy</b>	Full Incremental Cost
<b>Staffing/ Implementation Strategy</b>	The programme administrator should have at least a 0.5 FTE programme manager for this programme with an appropriate level of support staff. The vendor should be selected through an RFP process.
<b>Quality Control</b>	In the initial programme year there should be significant quality control of the in-home installations to ensure quality. In future years a sample of homes should be reviewed by a quality control vendor.
<b>Savings</b>	Savings are provided in Section 3.3
<b>Milestones</b>	Baseline of new construction practices RFP issued Vendor (s) selected Initial programme pilot
<b>Cost Effectiveness Assessment</b>	The Total Resource Cost Test Ratio (TRC) for the programme is 2.1-2.6 depending on the fuel.
<b>Coordination with other Programmes/ Alternative programmes designs</b>	This programme could be run in conjunction with a loan programme and or tax incentives
<b>Proposed Evaluation Procedures and Schedule</b>	This programme should have process evaluation and an impact evaluation within the first 18 months of operation. The process evaluation should include a customer survey and staff and vendor interviews. On-sites should be a critical part of the impact analysis.

## 2. Commercial / Industrial Programmes

### 2.1 Recommended Business Programmes

The lessons learnt from the international programmes were that direct financial incentives make a significant difference to the take and cost of programmes, significant opportunities exist in lighting and new construction and that improved information is critical to businesses undertaking energy efficiency investment. This led to two broad programmes for business customers which were:

- Business Customers Grants Programme (includes audits)
- New Construction Programme

### 2.2 Business Customers Grants Programme

<b>Programme Objective</b>	<p>The intent of the programme is to deliver energy efficiency savings for all fuels and to reduce peak electric demand. The programme would provide grant for new equipment or retrofits identified by audits or other assessments. The following types of measures would be included in the programme.</p> <ul style="list-style-type: none"><li>• Air conditioning and heating -- greater than 5 tons total;</li><li>• Lighting installations or retrofits;</li><li>• Boilers;</li><li>• Process measures;</li><li>• Heating systems;</li><li>• Lighting design;</li><li>• Controls;</li><li>• Motor replacement;</li><li>• Window coatings;</li><li>• Drives and Pumps;</li><li>• Compressed air; and</li><li>• Other -- (pre-approval required).</li></ul> <p>As the programme evolves, the programme administrator may chose to add new measures or upgrade qualification requirements to reflect changing market conditions. In addition, the programme administrator may chose to add a more complex custom measure approach to this programme and develop rebates and associated services for new construction.</p>
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<b>Barriers</b>	<p>Grant programmes have been a mainstay of energy efficiency programmes since the earliest days of demand-side management (DSM).</p> <p>The market barriers in the commercial/ industrial energy efficient equipment market include:</p> <ul style="list-style-type: none"> <li>• Information barriers both for customers and contractors;</li> <li>• Higher initial product cost;</li> <li>• Undervaluation of the energy efficiency cost benefits.</li> </ul> <p>In order to help overcome these barriers, the Rebate programme will:</p> <ul style="list-style-type: none"> <li>• Leverage the audit programme to provide information about opportunities ;</li> <li>• Provide grants to overcome the first cost differential;</li> <li>• Educate customer about energy efficient technologies;</li> <li>• Provide technical assistance where appropriate;</li> <li>• Increase awareness of contractors; and</li> <li>• Periodic assessment of product availability to determine ways that the marketing should adapt to insure that availability increases over time.</li> </ul>
<b>Programme Description</b>	<p>The programme is a large-scale grant programme that provides a full range of grants. The programme will begin with a portfolio of efficiency grants and add to or adjust those as appropriate to help influence the marketplace. The programme administrator will oversee the programme and administer the programme.</p> <p>Overtime it is expected that the programme administrator would develop savings worksheets for all measure categories and develop a custom measure approach to either be contained on a CD or submitted electronically. The programme administrator may also consider using payback as the criteria for future rebate design. i.e. provide grants that bring down the measure to a 2 year payback. The programme should also have a means for “custom measures”.</p> <p>One of the keys to success in a grant programme of this magnitude and diversity is to have a detailed tracking system to allow customers to request programme information and overtime to be able to submit applications on line. Ongoing tracking of programme targets, achievements, and funding must be done real-time to permit programme administrators as well as potential customers to have access to an up-to-date assessment of programme availability in a given year.</p> <p>Good technical assistance is also critical to the success of this type of programme. The programme administrator should add at least one engineer to support this programme and potentially qualify engineering firms to provide technical support for the programme.</p>
<b>Existing Programmes</b>	<p>There are existing audit programmes and technical support elements of existing programmes that are already operating in Ireland with a recent audit programme developed for SME businesses. Particularly the audit programme for SME business is likely to have a significant overlap with this programme and it is suggested that it is included as part of this wider programme.</p> <p>The LIEN and Energy Agreement Programme have been successful in educating customers and allowing them to identify opportunities. These should be continued alongside this Business Customer Grants programme.</p> <p>The biomass boiler programme could become part of the customer grants available.</p>

<b>Target Market</b>	The grant programme is available to all commercial and industrial customers.
<b>Eligible Measures</b>	The list of eligible measures should include over time all saving measure that pass the total resource cost test. A representative list derived from the model for Commercial and Industrial is shown at the end of this appendix. The aqua lines indicate the base measure. The white lines below each base measure present the possible options to save additional energy over the base measure.
<b>Implementation Strategy</b>	<p>As the programme administrator adds measures over time there are several programme setup steps that they must accomplish:</p> <ul style="list-style-type: none"> <li>• Develop a list of eligible measures and qualification criteria;</li> <li>• Develop all application forms;</li> <li>• Determine best grant payment strategy and procedures;</li> <li>• Implement programme tracking system (ideally with online application processing capabilities);</li> <li>• Create marketing and customer education materials; and</li> <li>• Provide market actor training and coordination.</li> </ul> <p>It is critical to keep several best practice findings at the core of the programme effort. First, the programme must be easy for customers to use. A simplified process must be maintained to ensure customer acceptance and ongoing processing efficiency. Second, coordination with local contractors is an ongoing process and must continue after programme launch. The programme administrator will need to continue to work with contractors, suppliers, retailers, and other market actors to not only keep assessing the market conditions and programme induced changes, but also to continue to inform them of the programme. Lastly, the programme must educate and inform customers about the programme offerings, participation requirements, and advantages of using more energy efficient equipment. The programme is an ongoing education process and must be staffed and continually developed to ensure ongoing programme success.</p> <p>Technical Assistance vendors should be selected through a formal procurement process or alternatively the customers can select their own vendors.</p>
<b>Quality Control</b>	<p>Quality control is an important means of ensuring that rebates are provided appropriately. As noted previously, an internet based application process should include quality control steps as part of the application so that any errors can be highlighted prior to submission. For example, automated quality control steps should check that customers provide their utility account number in the correct format, that multiple rebates are added up correctly, that customers are aware of all of the materials that they need to submit with their application, and so forth.</p> <p>In addition there will always be a manual element to the application process as the staff will inspect the submissions to ensure that materials are correct and that requested rebates are reasonable.</p> <p>The programme administrator should also consider having pre and post inspections of installations.</p>
<b>Performance Metrics</b>	The programme administrator should have, at minimum, quarterly programme summary reports, but preferably monthly reporting. The summary report should include both monthly and programme year-to-date totals. With an internet based application system, the report can be created and viewed online. The summary report will provide an overview of various programme metrics. The grant programme

	<p>project manager should also provide a regular commentary on successes, failures, and steps underway to improve the programme. Programme metrics should include:</p> <ul style="list-style-type: none"> <li>• Application requests;</li> <li>• Applications submitted (by measure type and by customer);</li> <li>• Applications approved;</li> <li>• Applications disapproved (by problem type);</li> <li>• Grants paid;</li> <li>• Grants in queue;</li> <li>• Grant funds remaining (by measure type if applicable);</li> <li>• Savings attributed to grants (by measure type and customer);</li> <li>• Inspections performed;</li> <li>• Customer calls;</li> <li>• Customer complaints; and</li> <li>• Customer questions.</li> </ul>
<p><b>Proposed Evaluation Procedures and Schedule</b></p>	<p>The programme evaluation should start with a baseline study of selected end use markets such as lighting and heating. This studies should assess the availability of energy efficient equipment, contractor interest in changing their inventory, and level of contractor knowledge of efficient products. The baseline study should include a statistically representative number of market actor interviews as well as some on-site visits with customers.</p> <p>Once the baseline has been established, the programme should operate for approximately two years. At that point, the programme administrator should perform a process evaluation to assess the successes and failures of the programme and how the programme might need to change to accommodate current market conditions. An update to the baseline study should be performed in conjunction with this process evaluation to determine the effect the programme may have had to date on the market. While the two-year interim period between the programme launch and this process evaluation is short, it is a good idea to ensure early on that rebates are being effectively marketed, allocated to appropriate measures, and paid using an efficient process.</p> <p>The process evaluation should include customer surveys, contractor surveys, and on-sites as in the initial baseline study. The evaluation team should analyse the verification results from the previous two-year period to ensure that appropriate validation efforts are in place and that the findings meet programme expectations. The process evaluation should also include an assessment of the savings estimates attributed to the programme and re-evaluate them in light of the actual measure rebates offered for the first two programme years.</p> <p>The programme administrator should perform participant satisfaction surveys regularly. Participant satisfaction studies should be focused not only on the customer's reaction to the specifics of the programme, but should also include an assessment of how potential programme market barriers may have been addressed.</p> <p>Subsequent evaluations should be process oriented and occur every two to three years of the programme. An impact evaluation may be advised as part of the second process evaluation in programme year four or five.</p>
<p><b>Estimated Budgets</b></p>	<p>The proposed budget for the programme is approximately 11 million Euros per year.</p>
<p><b>Savings</b></p>	<p>Savings are provided in section 3.</p>

<b>Milestones</b>	Final measure list Identification of TA vendors Marketing materials Programme launch
<b>Cost Effectiveness Assessment</b>	The TRC for this programme ranges from 2.2 to over 8 depending on the fuel.
<b>Coordination with Other Programmes/ Agencies</b>	This programme could be run in conjunction with a loan programme and or tax incentives

### 2.3 Commercial New Construction Programme

<b>Programme Objective</b>	<p>The intent of the programme is to deliver energy efficiency savings for all fuels in new buildings above the existing building regulations. The programme would provide grant for new equipment identified during the development of the building. The following types of measures would be included in the programme.</p> <ul style="list-style-type: none"> <li>• Air conditioning and heating -- greater than 5 tons total;</li> <li>• Lighting installations or retrofits;</li> <li>• Boilers;</li> <li>• Process measures;</li> <li>• Lighting design;</li> <li>• Controls;</li> <li>• Motor replacement;</li> <li>• Window coatings;</li> <li>• Drives and Pumps;</li> <li>• Solar hot water heating;</li> <li>• Compressed air; and</li> <li>• Other -- (pre-approval required).</li> </ul> <p>As the programme evolves, the programme administrator may chose to add new measures or upgrade qualification requirements to reflect changing market conditions. This programme will require training on both the building regulations and how to exceed them.</p>
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<b>Barriers</b>	<p>Grant programmes for new construction have been a mainstay of energy efficiency programmes since the earliest days of demand-side management (DSM). Effectively designed business construction programmes should include a significant educational component.</p> <p>The market barriers in the commercial/ industrial energy efficient new buildings market include:</p> <ul style="list-style-type: none"> <li>• Lack of knowledge of the building regulations;</li> <li>• Lack of knowledge of the technologies;</li> <li>• Information barriers both for customers and contractors;</li> <li>• Higher initial product cost; and</li> <li>• Undervaluation of the energy efficiency cost benefits.</li> </ul> <p>In order to help overcome these barriers, the Rebate programme will:</p> <ul style="list-style-type: none"> <li>• Provide grants to overcome the first cost differential;</li> <li>• Increase awareness of the new building regulations;</li> <li>• Educate customer and firms about energy efficient technologies;</li> <li>• Provide technical assistance where appropriate;</li> <li>• Increase awareness of contractors; and</li> <li>• Periodic assessment of product availability to determine ways that the marketing should adapt to insure that availability increases over time.</li> </ul>
<b>Programme Description</b>	<p>The programme provides grants for savings in new buildings for measures that exceed the building regulations. A programme administrator will oversee and administer the programme.</p> <p>Overtime it is expected that the programme administrator would develop savings worksheets for all measure categories and develop a custom measure approach to either be contained on a CD or submitted electronically. The programme administrator may also consider using payback as the criteria for future rebate design. i.e. provide grants that bring down the measure to a 2 year payback. The programme should also have a means for "custom measures".</p> <p>One of the keys to success in a grant programme of this magnitude and diversity is to have a detailed tracking system to allow customers to request programme information and overtime to be able to submit applications on line. Ongoing tracking of programme targets, achievements, and funding must be done real-time to permit programme administration as well as potential customers to have access to an up-to-date assessment of programme availability in a given year. The tracking system could be done in a manner consistent with the business retrofit programme.</p> <p>Good technical assistance is also critical to the success of this type of programme. The programme administrator should add at least one engineer to support this programme and potentially qualify engineering firms to provide technical support for the programme.</p>
<b>Existing Programmes</b>	<p>There are existing audit programmes and technical support elements of existing programmes that are already operating in Ireland. This includes the recent audit programme developed for SME businesses that could be modified to support this programme. Clearly this programme should be closely linked to training on the building regulations.</p> <p>The LIEN and Energy Agreement Programme have been successful in educating customers and allowing them to identify opportunities. These should be continued</p>

	<p>alongside this Business Customer Grants programme.</p> <p>The biomass boiler programme could become part of the customer grants available.</p>
<b>Target Market</b>	The grant programme is available to all commercial and industrial new buildings.
<b>Eligible Measures</b>	Any measures that are cost effective that save any fuel would be included. Measures would be similar to those in the Existing Buildings Grant Program.
<b>Implementation Strategy</b>	<p>As the programme administrator adds measures over time there are several programme setup steps that they must accomplish:</p> <ul style="list-style-type: none"> <li>• Develop list of eligible measures and qualification criteria;</li> <li>• Develop all application forms;</li> <li>• Determine best grant payment strategy and procedures;</li> <li>• Implement programme tracking system (ideally with online application processing capabilities);</li> <li>• Create marketing and customer education materials;</li> <li>• Use account representative to market to customers; and</li> <li>• Provide market actor training and coordination</li> </ul> <p>It is critical to keep several best practice findings at the core of the programme effort. First, the programme must be easy for customers to use. A simplified process must be maintained to ensure customer acceptance and ongoing processing efficiency. Second, coordination with local contractors is an ongoing process and must continue after programme launch. The programme administrator will need to continue to work with contractors, suppliers and other market actors to not only keep assessing the market conditions and programme induced changes, but also to continue to inform them of the programme. Lastly, the programme must educate and inform customers and vendors about the programme offerings, participation requirements, relationship to the building regulations and advantages of using more energy efficient equipment. The programme is an ongoing education process and must be staffed and continually developed to ensure ongoing programme success.</p> <p>Technical Assistance vendors should be selected through a formal procurement process or alternatively the customers can select their own vendors.</p>
<b>Marketing Strategy</b>	<p>Marketing efforts should leverage trade allies as much as possible.</p> <p>For the first two years of the programme, marketing efforts should be fairly high level with a focus on broad markets and messages throughout the country. The programme administrator should then use the results from the first two programme years to develop a more targeted marketing campaign that helps to capture market in areas underserved by the programme. In addition, as the programme administrator tracks the participation rates to various programme measures we suggest that they develop more targeted marketing campaigns to help push measures that might not be as accepted and need further customer education or other market transformation efforts.</p> <p>The programme administrator should monitor grants levels closely as the programme matures. The programme administrator should also monitor the implementation of the building regulations as this will have an impact on the effectiveness of this programme over time.</p>
<b>Staffing/ Implementation Strategy</b>	In order to oversee this large non- residential grant programme for new construction, The programme administrator should have a dedicated project manager assigned to the programme full time. Additional staff could be shared with the large business

	<p>grants programme.</p> <p>A well-developed grant programme can minimize staff requirements by leveraging the internet to streamline processing. The programme administrator should work with internal staff or a subcontractor to establish a system that simplifies processing as much as possible. An internet-based grant solution not only allows customers to access forms online, but also provides a good resource for detailed programme lists, links to retailers offering the programme, links to participating contractors, and a host of other dynamic services. The implementation team will then use the internet tools to data enter the paper application forms once they are received in the processing office.</p>
<p><b>Quality Control</b></p>	<p>Quality control is an important means of ensuring that grants are provided appropriately. As noted previously, an internet based application process should include quality control steps as part of the application so that any errors can be highlighted prior to submission. For example, automated quality control steps should check that customers provide their utility account number in the correct format, that multiple rebates are added up correctly, that customers are aware of all of the materials that they need to submit with their application, and so forth.</p> <p>In addition there will always be a manual element to the application process as the staff will inspect the submissions to ensure that materials are correct and that requested rebates are reasonable.</p> <p>The programme administrator should also consider having pre and post inspections of new building to ensure they meet the requirements for the grants.</p>

<b>Performance Metrics</b>	<p>The programme administrator should have, at minimum, quarterly programme summary reports, but preferably monthly reporting. The summary report should include both monthly and programme year-to-date totals. With an internet based application system, the report can be created and viewed online. The summary report will provide an overview of various programme metrics. The grant programme project manager should also provide a regular commentary on successes, failures, and steps underway to improve the programme. Programme metrics should include:</p> <ul style="list-style-type: none"> <li>• Application requests;</li> <li>• Applications submitted (by measure type and by customer);</li> <li>• Applications approved ;</li> <li>• Applications disapproved (by problem type?);</li> <li>• Grants paid;</li> <li>• Grants in queue;</li> <li>• Grant funds remaining (by measure type if applicable);</li> <li>• Savings attributed to grants(by measure type and customer);</li> <li>• Inspections performed;</li> <li>• Customer calls;</li> <li>• Customer complaints; and</li> <li>• Customer questions.</li> </ul>
<b>Proposed Evaluation Procedures and Schedule</b>	<p>The programme evaluation should start with a baseline study of selected end use markets such as lighting and heating for new construction. This studies should assess the availability of energy efficient equipment, contractor interest in changing their inventory, and level of contractor knowledge of efficient products. The baseline study should include a statistically representative number of market actor interviews as well as some on-site visits with customers.</p> <p>Once the baseline has been established, the programme should operate for approximately two years. At that point, the programme administrator should perform a process evaluation to assess the successes and failures of the programme and how the programme might need to change to accommodate current market conditions. An update to the baseline study should be performed in conjunction with this process evaluation to determine the effect the programme may have had to date on the market.</p> <p>The process evaluation should include customer surveys, contractor surveys, and on-sites as in the initial baseline study. The evaluation team should analyse the verification results from the previous two-year period to ensure that appropriate validation efforts are in place and that the findings meet programme expectations. The process evaluation should also include an assessment of the savings estimates attributed to the programme and re-evaluate them in light of the actual grants provided. The process evaluation should also assess the compliance with the building regulations.</p>
<b>Proposed Evaluation Procedures and Schedule (cont.)</b>	<p>The programme administrator should perform participant satisfaction surveys regularly. Participant satisfaction studies should be focused not only on the customer’s reaction to the specifics of the programme but should also include an assessment of how potential programme market barriers may have been addressed.</p> <p>Subsequent evaluations should be process oriented and occur every two to three years of the programme. An impact evaluation may be advised as part of the second</p>

	process evaluation in programme year four or five.
<b>Estimated Budgets</b>	The approximate budget for this programme is 1.2 Million Euros /year
<b>Savings</b>	The savings are presented in Section 3
<b>Milestones</b>	Baseline of usage Final Definition of measures Programme launch
<b>Cost Effectiveness Assessment</b>	The total resource cost test for this programme is 5.9
<b>Coordination with Other Programmes/ Agencies</b>	This programme could be run in conjunction with a loan programme and or tax incentives
<b>Other Considerations</b>	None

### 3. Budgets and Savings for Proposed Programmes

Budgets were developed at the sector level for both existing buildings and new buildings. These tables include here contain 5 years of budgets and savings. These budgets are for the Base programmes.

#### 3.1 Residential New Construction

Summary	Residential New	2008	2009	2010	2011	2012
Year						
Net Energy Savings - ktoe		0.7751	1.7737	2.9909	4.4026	5.9876
Net Peak Electricity Demand Savings - kW		713	1,688	2,916	4,374	6,040
New Net Energy Savings - ktoe		0.7751	0.9986	1.2172	1.4117	1.5850
New Net Peak Electricity Demand Savings - kW		713	974	1,229	1,457	1,666
Program Costs - Real						
Administration		€300,000	€412,659	€509,148	€590,511	€659,559
Marketing		€1,175,000	€1,175,000	€1,175,000	€1,175,000	€1,175,000
Incentives		€453,042	€688,159	€888,189	€1,054,663	€1,196,072
Total		€1,928,042	€2,275,818	€2,572,337	€2,820,174	€3,030,630
PV Net Avoided Costs		€8,284,012	€10,290,754	€12,014,740	€13,305,269	€14,245,920
PV Annual Marketing and Admin Costs		€1,475,000	€1,508,113	€1,519,616	€1,513,215	€1,493,615
PV Measure Costs		€1,523,121	€1,932,705	€2,293,815	€2,572,541	€2,796,591
TRC		2.76	2.99	3.15	3.26	3.32
PV Net Avoided Costs		€8,284,012	€10,290,754	€12,014,740	€13,305,269	€14,245,920
PV Annual Program Costs		€1,928,042	€2,161,794	€2,321,034	€2,417,165	€2,467,403
PV Lost Revenue		€11,582,421	€14,606,684	€17,202,363	€19,159,143	€20,601,676
RIM		0.61	0.61	0.62	0.62	0.62
Program Cost per First Year ktoe		€2,487,618	€2,278,910	€2,113,259	€1,997,702	€1,912,083
Program Cost per First Year kWh		€0.16	€0.14	€0.14	€0.13	€0.12
Program Cost per First Year Therm		€7.86	€7.45	€7.10	€6.87	€6.73
Annual Participant Costs (Real)		€1,046,225	€1,334,898	€1,650,132	€1,949,727	€2,248,239
Annual PV Participant Costs		€1,046,225	€1,268,017	€1,488,923	€1,671,106	€1,830,415
Naturally Occurring Energy Savings Total (Annual ktoe)		0.22	0.18	0.19	0.21	0.25
Accumulated Naturally Occurring Energy Savings Total (Annual ktoe)		0.22	0.39	0.58	0.79	1.04
Naturally Occurring Peak Demand Savings Total (Annual kW)		151.76	133.66	144.00	166.72	197.77
Accumulated Naturally Occurring Peak Demand Savings Total (Annual kW)		151.76	285.42	429.42	596.14	793.91
NPV Program Cost		€29,444,361				
NPV Participant Cost		€23,779,307				
NPV Avoided Costs (Benefits)		€176,475,077				

## 3.2 Residential Existing – Combines Residential Retrofit and Lighting and Appliances

Summary Residential Existing Homes - Tighten Up and Lighting and Appliances					
Year	2008	2009	2010	2011	2012
Net Energy Savings - ktoe	8.0263	18.0121	28.9932	40.2172	51.1386
Net Peak Electricity Demand Savings - kW	4.192	9.384	15.064	20.831	26.389
New Net Energy Savings - ktoe	8.0263	9.9858	10.9811	11.2240	10.9214
New Net Peak Electricity Demand Savings - kW	4.192	5.191	5.680	5.767	5.559
Program Costs - Real					
Administration	€450,000	€680,164	€33,388	€24,685	€68,555
Marketing	€3,000,000	€3,000,000	€3,000,000	€3,000,000	€3,000,000
Incentives	€1,015,387	€1,696,958	€2,141,057	€2,394,063	€2,500,923
Total	€4,465,387	€5,377,122	€5,974,445	€6,318,748	€6,469,478
PV Net Avoided Costs	€72,575,219	€85,509,003	€99,289,705	€86,766,451	€80,312,799
PV Annual Marketing and Admin Costs	€3,450,000	€3,495,779	€3,458,887	€3,363,838	€3,231,019
PV Measure Costs	€9,251,293	€10,698,728	€11,286,991	€11,262,049	€10,828,817
TRC	5.71	6.02	6.06	5.93	5.71
PV Net Avoided Costs	€72,575,219	€85,509,003	€99,289,705	€86,766,451	€80,312,799
PV Annual Program Costs	€4,465,387	€5,107,715	€5,390,774	€5,415,784	€5,267,158
PV Lost Revenue	€97,060,819	€114,116,448	€119,124,054	€115,813,048	€107,290,946
RIM	0.71	0.72	0.72	0.72	0.71
Real Measure Cost					
Program Cost per First Year ktoe	€56,342	€38,478	€44,067	€62,968	€92,369
Program Cost per First Year kWh	€0.05	€0.05	€0.05	€0.05	€0.05
Program Cost per First Year Therm	€2.51	€2.29	€2.26	€2.32	€2.45
Annual Participant Costs (Real)	€12,575,376	€13,809,590	€14,492,701	€14,735,213	€14,643,182
Annual PV Participant Costs	€12,575,376	€13,117,696	€13,076,842	€12,629,517	€11,921,819
Naturally Occurring Energy Savings Total (Annual ktoe)	10.76	10.53	10.21	9.81	9.37
Accumulated Naturally Occurring Energy Savings Total (Annual ktoe)	10.76	21.29	31.50	41.31	50.68
Naturally Occurring Peak Demand Savings Total (Annual kW)	5,236.72	5,158.14	5,040.12	4,892.32	4,722.77
Accumulated Naturally Occurring Peak Demand Savings Total (Annual kW)	5,236.72	10,394.86	15,434.98	20,327.30	25,050.07
NPV Program Cost	€56,875,079				
NPV Participant Cost	€127,810,534				
NPV Avoided Costs (Benefits)	€759,942,653				

### 3.3 Commercial Existing

Summary		Commercial Existing Buildings				
Year		2008	2009	2010	2011	2012
Net Energy Savings - ktoe		15,7154	35,9116	52,8821	66,2318	76,5119
Net Peak Electricity Demand Savings - kW		20,946	51,139	84,050	115,012	141,617
New Net Energy Savings - ktoe		15,7154	20,1962	16,9705	13,3497	10,2800
New Net Peak Electricity Demand Savings - kW		20,946	30,193	32,911	30,962	26,605
<b>Program Costs - Real</b>						
Administration		€450,000	€627,777	€632,061	€566,618	€507,536
Marketing		€3,500,000	€3,500,000	€3,500,000	€3,500,000	€3,500,000
Incentives		€2,395,184	€3,643,308	€3,701,661	€3,469,240	€3,157,720
<b>Total</b>		<b>€6,345,184</b>	<b>€7,771,085</b>	<b>€7,833,722</b>	<b>€7,535,858</b>	<b>€7,165,256</b>
PV Net Avoided Costs		€207,855,335	€273,066,756	€259,517,701	€219,004,516	€172,633,331
PV Annual Marketing and Admin Costs		€3,950,000	€3,920,966	€3,728,381	€3,485,489	€3,262,755
PV Measure Costs		€11,465,325	€15,511,274	€15,327,454	€14,006,338	€12,361,742
TRC		13.48	14.05	13.62	12.52	11.05
PV Net Avoided Costs		€206,861,385	€273,066,756	€259,517,701	€219,004,516	€172,633,331
PV Annual Program Costs		€6,345,184	€7,381,735	€7,068,410	€6,458,967	€5,833,629
PV Lost Revenue		€195,979,001	€256,871,828	€242,909,819	€204,356,565	€160,859,439
RIM		1.02	1.03	1.04	1.04	1.04
Program Cost per First Year ktoe		€403,757	€384,779	€461,608	€564,496	€697,008
Program Cost per First Year kWh		€0.03	€0.03	€0.03	€0.03	€0.04
Program Cost per First Year Therm		€2.75	€2.43	€3.12	€4.83	€7.76
Annual Participant Costs (Real)		€10,811,419	€14,430,669	€15,013,467	€14,568,862	€13,679,434
Annual PV Participant Costs		€10,811,419	€13,707,658	€13,546,732	€12,486,937	€11,137,179
Naturally Occurring Energy Savings Total (Annual ktoe)		5.28	5.16	4.98	4.77	4.52
Accumulated Naturally Occurring Energy Savings Total (Annual ktoe)		5.28	10.43	15.42	20.18	24.71
Naturally Occurring Peak Demand Savings Total (Annual kW)		7,921.01	8,126.31	8,170.18	8,088.05	7,910.93
Accumulated Naturally Occurring Peak Demand Savings Total (Annual kW)		7,921.01	16,047.32	24,217.50	32,305.55	40,216.48
NPV Program Cost		€63,131,148				
NPV Participant Cost		€106,917,377				
NPV Avoided Costs (Benefits)		€1,497,880,222				

### 3.4 Commercial New Construction

Summary Commercial New Construction					
Year	2008	2009	2010	2011	2012
Net Energy Savings - ktoe	0.9872	2.0100	3.0406	4.0718	5.1007
Net Peak Electricity Demand Savings - kW	3,060	6,241	9,433	12,609	15,761
New Net Energy Savings - ktoe	0.9872	1.0228	1.0306	1.0312	1.0289
New Net Peak Electricity Demand Savings - kW	3,060	3,181	3,192	3,176	3,152
Program Costs - Real					
Administration	€350,000	€381,453	€399,179	€411,920	€421,793
Marketing	€1,550,000	€1,550,000	€1,550,000	€1,550,000	€1,550,000
Incentives	€340,247	€904,438	€920,365	€924,319	€923,613
Total	€2,740,247	€2,835,891	€2,869,544	€2,886,239	€2,895,406
PV Net Avoided Costs	€22,427,007	€22,138,063	€21,124,236	€20,000,598	€18,884,146
PV Annual Marketing and Admin Costs	€1,900,000	€1,834,682	€1,758,755	€1,681,557	€1,605,345
PV Measure Costs	€1,852,329	€1,806,780	€1,726,065	€1,640,289	€1,555,421
TRC	5.98	6.08	6.06	6.02	5.97
PV Net Avoided Costs	€22,427,007	€22,138,063	€21,124,236	€20,000,598	€18,884,146
PV Annual Program Costs	€2,740,247	€2,693,806	€2,589,205	€2,473,789	€2,357,309
PV Lost Revenue	€21,200,454	€20,929,116	€19,972,472	€18,911,634	€17,857,238
RIM	0.94	0.94	0.94	0.94	0.93
Program Cost per First Year ktoe	€2,775,840	€2,772,646	€2,784,405	€2,798,927	€2,814,027
Program Cost per First Year kWh	€0.12	€0.12	€0.12	€0.12	€0.13
Program Cost per First Year Therm	€47.67	€42.76	€39.65	€37.53	€36.03
Annual Participant Costs (Real)	€1,009,435	€1,001,129	€999,265	€998,414	€997,627
Annual PV Participant Costs	€1,009,435	€950,970	€901,642	€855,738	€812,223
Naturally Occurring Energy Savings Total (Annual ktoe)	0.12	0.07	0.06	0.06	0.06
Accumulated Naturally Occurring Energy Savings Total (Annual ktoe)	0.12	0.19	0.25	0.31	0.38
Naturally Occurring Peak Demand Savings Total (Annual kW)	365.88	227.13	200.04	198.51	205.59
Accumulated Naturally Occurring Peak Demand Savings Total (Annual kW)	365.88	593.01	793.05	991.56	1,197.16
NPV Program Cost	€27,947,218				
NPV Participant Cost	€9,690,331				
NPV Avoided Costs (Benefits)	€221,470,094				

### 3.5 Industrial

Summary		Industrial				
Year	2008	2009	2010	2011	2012	
Net Energy Savings - ktoe	16.5427	31.5969	41.0896	47.6195	52.4344	
Net Peak Electricity Demand Savings - kW	2,688	6,022	9,765	13,724	17,752	
New Net Energy Savings - ktoe	16.5427	15.0542	9.4927	6.5299	4.8148	
New Net Peak Electricity Demand Savings - kW	2,688	3,334	3,743	3,959	4,028	
<b>Program Costs - Real</b>						
Administration	€450,000	€542,881	€553,375	€563,064	€569,392	
Marketing	€3,000,000	€3,000,000	€3,000,000	€3,000,000	€3,000,000	
Incentives	€965,635	€1,181,133	€1,153,107	€1,138,927	€1,127,429	
<b>Total</b>	<b>€4,415,635</b>	<b>€4,724,015</b>	<b>€4,706,481</b>	<b>€4,701,991</b>	<b>€4,696,821</b>	
<b>PV Net Avoided Costs</b>						
PV Net Avoided Costs	€101,210,281	€90,562,884	€63,113,819	€48,360,254	€39,266,112	
PV Annual Marketing and Admin Costs	€3,450,000	€3,365,374	€3,206,229	€3,053,893	€2,906,038	
PV Measure Costs	€5,626,427	€6,029,966	€5,415,655	€4,943,242	€4,542,551	
TRC	11.15	9.64	7.32	6.05	5.27	
<b>PV Net Avoided Costs</b>						
PV Net Avoided Costs	€101,210,281	€90,562,884	€63,113,819	€48,360,254	€39,266,112	
PV Annual Program Costs	€4,415,635	€4,487,330	€4,246,683	€4,030,065	€3,823,940	
PV Lost Revenue	€94,396,245	€82,522,591	€54,546,124	€39,765,986	€30,979,623	
RIM	1.02	1.04	1.07	1.10	1.13	
Program Cost per First Year ktoe	€266,923	€313,801	€495,800	€720,071	€975,489	
Program Cost per First Year kWh	€0.17	€0.16	€0.16	€0.16	€0.17	
Program Cost per First Year Therm	€0.59	€0.92	€1.39	€1.96	€2.67	
<b>Annual Participant Costs (Real)</b>						
Annual PV Participant Costs	€5,433,574	€5,917,732	€5,575,457	€5,328,402	€5,125,239	
Naturally Occurring Energy Savings Total (Annual ktoe)	3.58	3.59	3.52	3.33	3.14	
Accumulated Naturally Occurring Energy Savings Total (Annual ktoe)	3.58	7.18	10.69	14.02	17.16	
Naturally Occurring Peak Demand Savings Total (Annual kW)	2,089.20	1,981.24	1,878.50	1,780.89	1,688.33	
Accumulated Naturally Occurring Peak Demand Savings Total (Annual kW)	2,089.20	4,070.44	5,948.94	7,729.83	9,418.16	
NPV Program Cost	€45,391,337					
NPV Participant Cost	€48,233,324					
NPV Avoided Costs (Benefits)	€524,709,421					

### 3.6 Overall Budget – all Sectors

Summary		Overall Programs				
Year	2008	2009	2010	2011	2012	
Net Energy Savings - ktoe	42.0	89.3	129.0	162.5	191.2	
Net Peak Electricity Demand Savings - kW	31,600	74,474	121,228	166,550	207,560	
New Net Energy Savings - ktoe	42.0	47.3	39.7	33.5	28.6	
New Net Peak Electricity Demand Savings - kW	31,600	42,875	46,754	45,322	41,010	
<b>Program Costs - Real</b>						
Administration	2,000,000	2,644,935	2,927,152	3,056,797	3,126,834	
Marketing	12,225,000	12,225,000	12,225,000	12,225,000	12,225,000	
Incentives	5,669,496	8,113,996	8,804,378	8,981,213	8,905,757	
<b>Total</b>	<b>19,894,496</b>	<b>22,983,931</b>	<b>23,956,530</b>	<b>24,263,010</b>	<b>24,257,590</b>	
<b>PV Net Avoided Costs</b>						
PV Net Avoided Costs	412,351,854	481,567,460	445,060,201	387,437,089	325,342,308	
PV Annual Marketing and Admin Costs	14,225,000	14,124,915	13,671,868	13,097,993	12,498,772	
PV Measure Costs	29,718,495	35,979,452	36,049,981	34,424,459	32,085,122	
TRC	9.38	9.61	8.95	8.15	7.30	
<b>PV Net Avoided Costs</b>						
PV Net Avoided Costs	411,357,904	481,567,460	445,060,201	387,437,089	325,342,308	
PV Annual Program Costs	19,894,496	21,832,380	21,616,106	20,795,769	19,749,438	
PV Lost Revenue	420,218,941	489,046,667	453,754,831	398,006,377	337,588,922	
RIM	0.93	0.94	0.94	0.93	0.91	
Program Cost per First Year ktoe	6,490,480	6,288,613	6,399,140	6,644,165	6,990,976	
Program Cost per First Year kWh	0.52	0.51	0.50	0.50	0.51	
Program Cost per First Year Therm	61.37	55.85	53.52	53.51	55.64	
<b>Annual Participant Costs (Real)</b>						
Annual PV Participant Costs	30,876,028	36,494,018	37,731,023	37,580,618	36,693,720	
Naturally Occurring Energy Savings Total (Annual ktoe)	19.9	19.5	19.0	18.2	17.3	
Accumulated Naturally Occurring Energy Savings Total (Annual ktoe)	19.9	39.5	58.4	76.6	94.0	
Naturally Occurring Peak Demand Savings Total (Annual kW)	15,765	15,626	15,433	15,126	14,725	
Accumulated Naturally Occurring Peak Demand Savings Total (Annual kW)	15,765	31,391	46,824	61,950	76,676	
NPV Program Cost	222,789,142					
NPV Participant Cost	316,430,873					
NPV Avoided Costs (Benefits)	3,180,477,467					

## 4. Pilot Only Programmes

### 4.1 Background

There are two separate pilot programmes that could be run to prove the concept of peak pricing to assist Supplier in determining whether they should run these types of tariffs. The programmes are:

- Residential Critical Peak Pricing Programme; and
- Commercial Critical Peak Pricing Programme.

### 4.2 Residential Critical Peak Pricing Programmes

<b>Programme Name</b>	<b>Residential Critical Peak Pricing Pilot Programme</b>
<b>Programme Objective</b>	The objective of the pilot programme is to test the capability to reduce peak load by providing participants with price signals that reflect the high cost of electricity at peak usage times. In addition it should provides participants with the technology and capability to respond to high peak prices when they occur.
<b>Programme Theory</b>	Customers should be provided price signals that better reflect the varying cost of electricity by time of day and season. A full scale programme could relieve stress on the Electricity network during peak times and create downward pressure on high peak energy costs by reducing load at peak usage periods.
<b>Target Market</b>	A pilot test group of 400 residential customers with high electric use, water heating and or heat pumps that are in good working order are eligible for the pilot program.
<b>Programme Description</b>	This programme combines and tests a four-part time of use rate, which includes a critical peak price (i.e. a very high price at limited times) with the technology to both communicate the prices to customers as well as control specific appliances such as central air conditioners.  Customers pay a monthly fee to participate in the programme.
<b>Measures, Products, Services</b>	The programme's only measure is the technology to receive and communicate price signals and control appliances such as electric water heaters and electric space heat. In addition, the technology also provides outage detection.  Customers receive service subject to a special time of use rate with a critical peak pricing component, i.e. a significantly higher price during limited hours.

<b>Marketing and Incentive Strategy</b>	<p>No direct incentive is offered, although participants can adjust their electric usage and achieve bill savings due to the rate's unique design. Marketing focuses on enabling customer response as a preferred alternative to utility intervention through direct control of customer appliances.</p> <p>Customers pay a monthly fee to participate in the Programme (For example Gulf Power charges \$5 per month).</p> <p>Recruitment will occur via a limited direct mail campaign and website.</p>
<b>Implementation Strategy</b>	<p>The programme administrator would contract with an outside vendor to plan and conduct the pilot programme as a research test. Contracted services would include the purchase, installation and maintenance of all necessary equipment, and coordination with CE regarding systems and cycling strategy.</p> <p>The Supplier will need to develop and obtain approval for a special rate as part of this programme.</p>
<b>Quality Control</b>	<p>Quality control includes checking to assure reliable data is collected, especially during critical peak pricing periods, and sample-based testing of installations, performance of equipment, and customer satisfaction.</p>
<b>Budget</b>	<p>€1.25m Further breakdown as follows:  Direct Incentives - \$0  Marketing - €50,000  Contract Administration –€1,200,000.</p>
<b>Target Results</b>	<p>Annual electricity savings: 10 MWH/year  Participants: 400  Measures: 400  Cost of Conserved Energy: Not Applicable.</p>
<b>Keys to Programme Success</b>	<p>Selection and integration of equipment  Solid pilot test research design.  Effective installation and performance of new equipment.</p>

### 4.3 Commercial Critical Peak Pricing Programme

<b>Programme Name</b>	<b>Customer Load Response Pilot</b>
<b>Programme Objective</b>	The objective of the pilot programme is to test the customer acceptance and ability of non-residential customers to curtail at least 10 kW upon 1 hours' notice when presented a per-kWh reduced incentive.
<b>Programme Theory</b>	Price responsive load increases system reliability and creates downward pressure on peak market prices. Customers who are prepared with a plan to curtail load will curtail their load upon short notice when presented with an incentive that is based upon the market value of electricity at the particular time.
<b>Target Market</b>	Up to 400 non-residential electric customers capable of reducing their load by at least 10 kW are eligible for this programme.
<b>Programme Description</b>	<p>This is a pilot programme to assess customer interest and performance in reducing load on a voluntary basis upon notice from Suppliers. The Suppliers will notify energy managers the price per kWh. There will be payments when a curtailment event is invoked. Energy managers can decide whether or not they will lower their usage. Incentives for lowering usage are based on hourly wholesale energy market prices and/or system conditions. Cash or billing credits will be delivered to participating firms by the end of each calendar year.</p> <p>Participants receive one hour notice before each load curtailment notice Curtailment events are for no less than two hours and no more than eight hours.</p>
<b>Measures, Products, Services</b>	There are no measures for this programme.
<b>Marketing and Incentive Strategy</b>	Incentives will be designed to cover the incremental price of electricity at the time of curtailment, plus 10% margin for the Supplier.
<b>Implementation Strategy</b>	The programme administrator and the Supplier would contract with an implementation contractor to recruit customers and manage the program. The implementation contractor would need to coordinate extensively with both parties during curtailment events.
<b>Quality Control</b>	Spot pre-inspections and post-inspections will ensure that the projects rebated are the projects completed. A well designed and functioning tracking system is important for providing data that can be periodically checked to ensure quality.
<b>Budget</b>	\$1,500,000 per year. Further breakdown as follows: Direct Incentives - €1,300,000 Marketing - €20,000 Contract Administration – €180,000
<b>Target Results</b>	Annual electricity savings: 1 MW peak demand Participants: 50 Measures: 0 Savings assumptions: Participants reduce 20 kW on average.

**Keys to Programme  
Success**

Development and execution of effective communications with participants during curtailment events.  
Solid pilot test research design.

## 5. Suggested Measures for Business Customers Grants Programme

### Commercial Gas and Oil

#### Base Heating

- Ceiling Insulation (In situ R5 to R24)
- Double Pane Low Emissivity
- Duct Insulation Installed
- Duct Leakage Repair
- High Efficiency (Power Burner/ Premium) Furnace/Boiler 95% efficiency (in situ base=82%)
- Boiler- Heating Pipe Insulation
- Boiler Tune-Up
- EMS install
- EMS Optimization
- Stack Heat Exchanger
- Heat Recovery from Air to Air
- Heat Recovery from AC

#### Base Water Heating

- Eff Gas Water Heater System 95% Efficiency (base=76%)
- Instantaneous Water Heater  $\leq 200$  MBTUH
- Circulation Pump Timeclocks retrofit system 7 day timeclock
- Tank Insulation
- Pipe Insulation
- Low Flow Showerheads
- Faucet Aerator
- Solar DHW System Active
- Base Cooking
- Efficient Infrared Griddle
- Convection Oven
- Infrared Conveyer Oven
- Infrared Fryer
- Power Burner Oven
- Power Burner Fryer

#### Base Pool Heating

- High Efficiency Pool Heater, eff.=0.97 320 kbtu
- Pool Cover
- Solar Pool Heater

## Commercial Electric

Measure	Description
Base Fluorescent Fixture, 4L4'T12, 34W, 2EEMAG	RET 4L4' Premium T8, 1EB RET 2L4' Premium T8, 1EB, Reflector Occupancy Sensor, 4L4' Fluorescent Fixtures Continuous Dimming, 5L4' Fluorescent Fixtures Lighting Control Tuneup
Base Fluorescent Fixture, 2L4'T12, 34W, 1EEMAG	RET 2L4' Premium T8, 1EB RET 1L4' Premium T8, 1EB, Reflector OEM Occupancy Sensor, 8L4' Fluorescent Fixtures Continuous Dimming, 10L4' Fluorescent Fixtures Lighting Control Tuneup
Base Fluorescent Fixture, 2L8'T12, 60W, 1EEMAG	RET 2 - 2L4' Premium T8, 1EB RET 2 - 1L4' Premium T8, 1EB, Reflector OEM Occupancy Sensor, 4L8' Fluorescent Fixtures Continuous Dimming, 5L8' Fluorescent Fixtures
Base Incandescent Flood, 75W to Screw-in CFL	CFL Screw-in 18W
Base Incandescent Flood, 75W to Hardwired CFL	CFL Hardwired, Modular 18W
Base High Bay Metal Halide, 400W	High Bay T5
Base 4L4'T8, 1EB	ROB 4L4' Premium T8, 1EB Occupancy Sensor, 4L4' Fluorescent Fixtures Lighting Control Tuneup
Base 2L4'T8, 1EB	ROB 2L4' Premium T8, 1EB Occupancy Sensor, 8L4' Fluorescent Fixtures Lighting Control Tuneup
Base Exit Sign	LED Exit Sign
Base Outdoor Mercury Vapor 400W Lamp	High Pressure Sodium 250W Lamp Outdoor Lighting Controls (Photocell/Timeclock)
Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	Centrifugal Chiller, 0.51 kW/ton, 500 tons Window Film (Standard) EMS - Chiller Cool Roof - Chiller Chiller Tune Up/Diagnostics VSD for Chiller Pumps and Towers EMS Optimization Economizer
Base DX Packaged System, EER=10.3, 10 tons	DX Tune Up/ Advanced Diagnostics

DX Packaged System, EER=10.9, 10 tons  
Window Film (Standard)  
Evaporative Pre-Cooler  
Prog. Thermostat – DX  
Cool Roof – DX  
Optimize Controls  
Economizer

**Base Fan Motor, 5hp, 1800rpm, 87.5%**

Fan Motor, 5hp, 1800rpm, 89.5%  
Variable Speed Drive Control, 5 HP

**Base Fan Motor, 15hp, 1800rpm, 91.0%**

Fan Motor, 15hp, 1800rpm, 92.4%  
Variable Speed Drive Control, 15 HP  
Air Handler Optimization, 15 HP

**Base Fan Motor, 40hp, 1800rpm, 93.0%**

Fan Motor, 40hp, 1800rpm, 94.1%  
Variable Speed Drive Control, 40 HP  
Air Handler Optimization, 40 HP

**Base Desktop PC**

PC Manual Power Management Enabling  
PC Network Power Management Enabling

**Base Monitor, CRT**

High-efficiency Monitor, CRT  
Monitor Power Management Enabling, CRT

**Base Monitor, LCD**

High-efficiency Monitor, LCD  
Monitor Power Management Enabling, LCD

**Base Copier**

High-efficiency Copier  
Copier Power Management Enabling

**Base Laser Printer**

Printer Power Management Enabling

**Base Split-system Heat Pump, 2.3 EER**

3.5 EER Split-system Heat Pump  
Tune Up/ Proper Refrigerant Charge  
Programmable Thermostat

**Base Electric Resistance Reheat Coils**

BMS - Reheat Coils  
BMS Optimization

**Base Wall-mounted Fan Heater**

Programmable Thermostat

**Base Water Heating**

Demand controlled circulating systems  
Packaged Terminal Heat Pump  
High Efficiency Water Heater (electric)  
Hot Water Pipe Insulation  
Tankless Water Heater

**Base Vending Machines**

Vending Misers (cooled machines only)

## Industrial

- 100 Base Compressed Air**
- 101 Compressed Air-O&M
- 102 Compressed Air - Controls
- 103 Compressed Air - System Optimization
- 104 Compressed Air- Sizing
- 105 Comp Air - Replace 1-5 HP motor
- 106 Comp Air - ASD (1-5 hp)
- 107 Comp Air - Motor practices-1 (1-5 HP)
- 108 Comp Air - Replace 6-100 HP motor
- 109 Comp Air - ASD (6-100 hp)
- 110 Comp Air - Motor practices-1 (6-100 HP)
- 111 Comp Air - Replace 100+ HP motor
- 112 Comp Air - ASD (100+ hp)
- 113 Comp Air - Motor practices-1 (100+ HP)
- 114 Power recovery
- 115 Refinery Controls
- 116 Energy Star Transformers
- 200 Base Fans**
- 201 Fans - O&M
- 202 Fans - Controls
- 203 Fans - System Optimization
- 204 Fans- Improve components
- 205 Fans - Replace 1-5 HP motor
- 206 Fans - ASD (1-5 hp)
- 207 Fans - Motor practices-1 (1-5 HP)
- 208 Fans - Replace 6-100 HP motor
- 209 Fans - ASD (6-100 hp)
- 210 Fans - Motor practices-1 (6-100 HP)
- 211 Fans - Replace 100+ HP motor
- 212 Fans - ASD (100+ hp)
- 213 Fans - Motor practices-1 (100+ HP)
- 214 Optimize drying process
- 215 Power recovery
- 216 Refinery Controls
- 217 Energy Star Transformers
- 300 Base Pumps**
- 301 Pumps – O&M
- 302 Pumps - Controls
- 303 Pumps - System Optimization
- 304 Pumps - Sizing
- 305 Pumps - Replace 1-5 HP motor
- 306 Pumps - ASD (1-5 hp)
- 307 Pumps - Motor practices-1 (1-5 HP)
- 308 Pumps - Replace 6-100 HP motor
- 309 Pumps - ASD (6-100 hp)
- 310 Pumps - Motor practices-1 (6-100 HP)

311	Pumps - Replace 100+ HP motor
312	Pumps - ASD (100+ hp)
313	Pumps - Motor practices-1 (100+ HP)
314	Power recovery
315	Refinery Controls
316	Energy Star Transformers
<b>400</b>	<b>Base Drives</b>
401	Bakery - Process (Mixing) - O&M
402	O&M/drives spinning machines
403	Air conveying systems
404	Replace V-Belts
405	Drives - EE motor
406	Gap Forming papermachine
407	High Consistency forming
408	Optimization control PM
409	Efficient practices printing press
410	Efficient Printing press (fewer cylinders)
411	Light cylinders
412	Efficient drives
413	Clean Room - Controls
414	Clean Room - New Designs
415	Drives - Process Controls (batch + site)
416	Process Drives - ASD
417	O&M - Extruders/Injection Moulding Extruders/injection Moulding- multipump
418	
419	Direct drive Extruders
420	Injection Moulding - Impulse Cooling
421	Injection Moulding - Direct drive
422	Efficient grinding
423	Process control
424	Process optimization
425	Drives - Process Control
426	Efficient drives - rolling
427	Drives - Optimization process (M&T)
428	Drives - Scheduling
429	Machinery
430	Efficient Machinery
431	Energy Star Transformers
<b>500</b>	<b>Base Heating</b>
501	Bakery - Process
502	Drying (UV/IR)
503	Heat Pumps - Drying
504	Top-heating (glass)
505	Efficient electric melting
506	Intelligent extruder (DOE)
507	Near Net Shape Casting
508	Heating - Process Control

509	Efficient Curing ovens
510	Heating - Optimization process (M&T)
511	Heating - Scheduling
512	Energy Star Transformers
550	Base Refrigeration
551	Efficient Refrigeration - Operations
552	Optimization Refrigeration
553	Energy Star Transformers
<b>600</b>	<b>Base Other Process</b>
601	Other Process Controls (batch + site)
602	Efficient desalter
603	New transformers welding
604	Efficient processes (welding, etc.)
605	Process control
606	Power recovery
607	Refinery Controls
608	Energy Star Transformers
<b>700</b>	<b>Centrifugal Chiller, 0.58 kW/ton, 500 tons</b>
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons
702	Window Film - Chiller
703	EMS - Chiller
704	Cool Roof - Chiller
705	Chiller Tune Up/Diagnostics
706	Cooling Circ. Pumps - VSD
707	Energy Star Transformers
710	DX Packaged System, EER=10.3, 10 tons
711	DX Tune Up/ Advanced Diagnostics
712	DX Packaged System, EER=10.9, 10 tons
713	Window Film - DX
714	Evaporative Pre-Cooler
715	Prog. Thermostat - DX
716	Cool Roof - DX
717	Energy Star Transformers
<b>800</b>	<b>Base Lighting</b>
801	RET 2L4' Premium T8, 1EB
802	CFL Hardwired, Modular 36W
803	Metal Halide, 50W Occupancy Sensor, 4L4' Fluorescent
804	Fixtures
805	Energy Star Transformers
<b>900</b>	<b>Base Other</b>
901	Replace V-belts
902	Membranes for wastewater
903	Energy Star Transformers



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*SEI is funded by the Irish Government under the National Development Plan 2007 – 2013 with programmes part financed by the European Union.*