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An Coimisiún um Rialáil Fuinnimh

Smart Metering Programme Ireland



National Smart Meter Plan

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Commission for Energy Regulation

Programme Manager

31-05-2012



- Context
 - Overview of the CER
 - Overview of Irish Energy Market
 - Current Metering Overview
- Smart Metering Programme Phase 1 Overview
 - Customer Behaviour Trials (CBTs)
 - Technology Trials
 - Cost-Benefit Analyses (CBAs)
 - Consultation
 - Next Steps (Decision & Implementation)

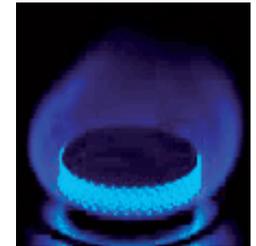


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Overview of CER

- CER is Ireland's independent energy regulator
- CER has broad economic, safety and customer protection functions in energy
- Details of the CER's role at www.cer.ie
- CER is currently led by:
 - Dermot Nolan, Chairperson
 - Garrett Blaney, Commissioner



CER Overview of Irish Energy Market

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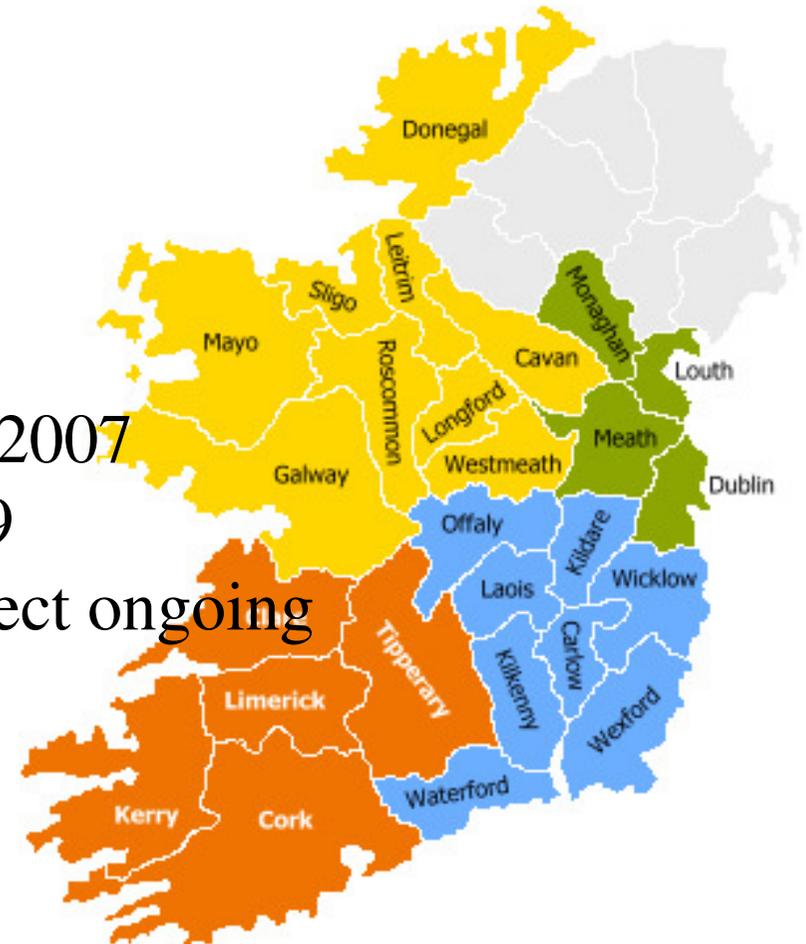
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Electricity:

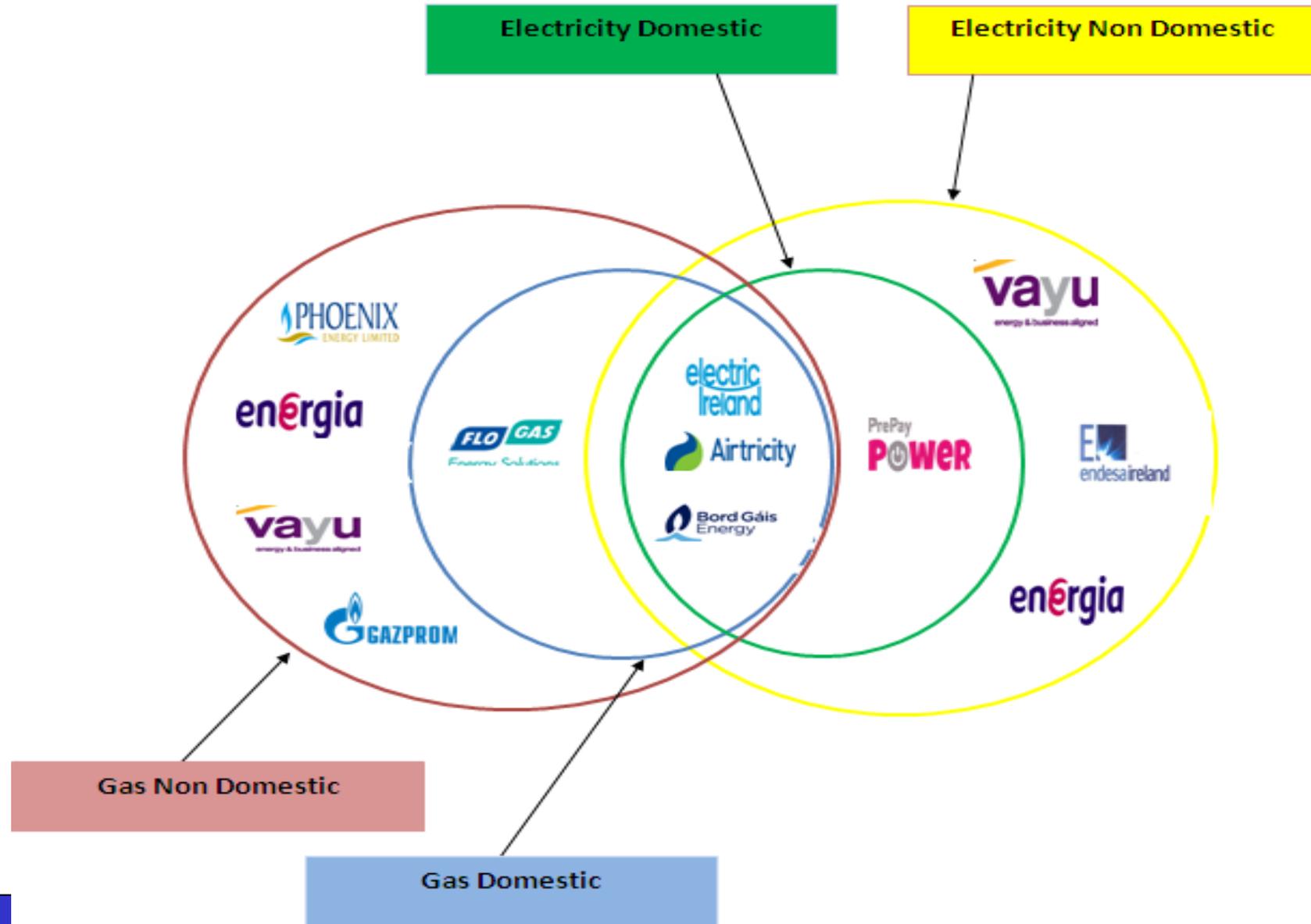
- 2.2m customers (c.30% rural)
- 1 DSO (ESB Networks)
- 1 TSO (EirGrid)
- All-island Wholesale Market (SEM) 2007
- Full Retail Market Deregulation 2009
- All-island Retail Harmonisation Project ongoing

Gas:

- 0.6m customers (mainly urban)
- 1 DSO (BG Networks)
- 1 TSO (Gaslink)
- All-island Wholesale & Retail Harmonisation (CAG project in progress)
- Full Retail Market Deregulation in progress



Suppliers Overview



Current Metering Overview

- DSO owns, maintains & replaces meters
- Residential/SME customers:
 - Mainly conventional electro-mechanical (majority single phase) & gas diaphragm meters (G4)
 - Manual DSO meter reading (4 bi-monthly actuals & 2 estimates p/a) & meter services
 - Increasing prepayment service demand
 - Limited micro gen' import/export meters
- Large Industrial & Commercial customers:
 - QH electricity & daily gas (out of scope)





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Drivers for Smart Metering in Ireland



Potential Benefits

- Encourage energy efficiency
- Improve peak load management
- Support renewables generation (40% wind target)
- Enhance competition
- Improve consumer experience
- Improve network operations & services
(including facilitating Smart Grid & EVs)

- **EU Legislation:**
 - Draft Energy Efficiency Directive (due 2012)
 - Third Legislative Package for Electricity (2009/72/EC) and Gas (2009/73/EC) – installation by 2020
 - Energy End-use Efficiency and Energy Services Directive (2006/32/EC) – costs reflective tariffs
 - Security of Supply Directive (2005/32/EC) – advanced metering systems
- **Irish National Energy Efficiency Action Plan**
(NEEAP 1 in 2009 & NEEAP 2 due in 2012)
- **CER Consultation Paper 2007** (Desktop Analysis)



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CER Smart Metering Programme

Phase 1

(Discovery, Exploration and
Business Case Development)



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Phase 1 Overview – Participants & Key Deliverables

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 BORD GÁIS
NETWORKS

 Bord Gáis Energy
think beyond

 **seai** SUSTAINABLE
ENERGY AUTHORITY
OF IRELAND



Department of Communications, Energy and Natural Resources
Roinn Cumarsáide, Fuinnimh agus Acmhainní Nádurtha



National Smart Meter Plan

 ESB Networks

 ESB electric
Ireland



**Customer Behaviour
Trials Findings Reports**

Electricity: CER/11/080a

Gas: CER/11/180a

**Technology Trials
Findings Reports**

Electricity: CER/11/080b

Dual Fuel : CER/11/180b

**Cost-Benefit Analyses
Reports**

Electricity: CER/11/080c

Gas : CER/11/180c



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Overview of the Customer Behaviour Trials (CBTs)

Separate Electricity & Gas Trials
(Mainly Residential but some SMEs)



Objective of the CBTs

*“to ascertain the potential for smart metering technology to effect **measurable change in consumer behaviour**, which will result in the **reduction of peak demand and overall energy use**, when operated with appropriate DSM initiatives.”*

- Better **price** signals - Time of use (ToU) tariffs *combined with*
- Better **information** – in-home displays (IHDs) & energy usage statements with billing (mthly/bi-mthly)

****Results to inform cost-benefit analysis (CBA)****



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Electricity Residential Customer Behaviour Trial (CBT)

Design, Stimuli & Results



Experimental Design

(6mth Benchmark Period / 12mth Active Test Period)

Tariff	Bi-monthly detailed bill and energy use statement	Monthly detailed bill and energy use statement	Bi-monthly detailed bill and Electricity Monitor	Bi-monthly detailed bill, energy use statement plus Overall Load Reduction	
Tariff A	342	342	342	342	1,368
Tariff B	127	129	127	128	511
Tariff C	342	342	343	343	1,370
Tariff D	127	129	126	127	509
Weekend					100
Control Group					1,170
	938	942	938	940	5,028

Each cell statistically representative of the population (pre-trial survey)

- 2% minimum effect statistically significant
- Figures inclusive of 20% Fallout Assumption
- Voluntary opt-in letter recruitment (30%)

Stimulus Design: ToU Tariffs

- The time of use (ToU) tariffs were designed to be:
 - neutral in comparison with the standard regulated tariff to ensure that the “average” participant who did not alter their electricity consumption pattern was not penalised financially.
 - to reflect the underlying cost of energy transmission, distribution, generation and supply as per standard tariffs.
 - would be based on system demand peaks and based on the cost inputs used in the 2009/10 regulated tariffs.

Domestic Time of Use Tariffs				
Vs. Normal Rate = 14.1 € cents/kWh		Week Night 23.00 – 8.00	Week Day 8.00 – 17.00 19.00 – 23.00	Peak 17.00 – 19.00 (Monday to Friday), ex. holidays
Tariff A	Cents per kWh	12.00	14.00	20.00
Tariff B	Cents per kWh	11.00	13.50	26.00
Tariff C	Cents per kWh	10.00	13.00	32.00
Tariff D	Cents per kWh	9.00	12.50	38.00

Stimulus Design: ToU Recall/Reminder Aids



Different times, different prices

DAY 8am - 5pm	PEAK* 5pm - 7pm	DAY 7pm - 11pm	NIGHT 11pm - 8am
14c	20c	14c	12c

* Peak rate applies Monday to Friday only excluding Public Holidays.
 Time of Use pricing will apply from 1st January - 31st December 2010.
 Rates may be subject to change in line with ESB Customer Supply tariff changes.
 Prices exclude VAT.



Stickers and Fridge Magnets

Detailed bills and energy statements:

- First stimulus – bill amount
- Frequency: Monthly or bi-monthly
- Energy statement design informed by focus groups:
 - Energy awareness
 - Hints and Tips
 - Peer comparison
 - Historical usage
 - Information



Energy awareness



Typical cost of running various appliances over a full year*

Main household appliances (excl. Electric Oven)	NIGHT RATE	DAY RATE	PEAK RATE
Washing machine	€55	€64	€91
Tumble dryer	€183	€213	€305
Dishwasher	€73	€85	€122
Immersion - 6 months only	€203	€236	€338

* Average usage 1 cycle per day, 5 days a week for a full year. Immersion: 1 tank per day 6 months only.

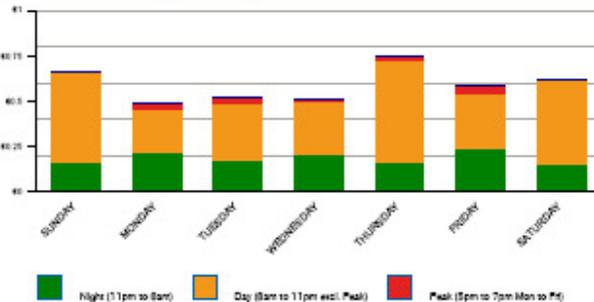
Hints and Tips

- Money Down the Drain - During the peak period (5pm to 7pm) an instantaneous electric shower running for 15 minutes costs you €14.30 per year. At day rates it would cost you €80.01 per year.
- Remember! To make the greatest savings always try to be energy efficient when you use your appliances even when you shift to an Off-Peak time.
- Beat the Peak. If using a dishwasher washing your dishes at peak rate will cost you €21.92 per year; on the day rate it would cost you €85.34 per year.

Has your electricity usage changed?

- 2.8% of your electricity for last month was used in the peak period. By using some of your appliances at day rate rather than at peak rate you could save money.
- Last month 572 customers on your tariff have reduced the amount of electricity they use. You are one of them. Congratulations!

Your average day of the week costs



Further information

Values given above may be slightly different to Page 1 due to rounding impacts. The correct final values are those displayed on Page 1 of the Bill.

Learn More

2010 Electricity Reduction Target

Your Target

Use less than **330** Units By 31 Dec

Used so far **330** Units

Reduce your usage Goals

Goal THIS bill - Use less than **330** Units

Goal NEXT bill - Use less than **330** Units

You are outside your goal for this period, can you reduce your usage more? See the energy tips above.

Your goals help to meet your annual target. Reach your target in December and earn €20 AS WELL as any savings you make on your bill.

Stimulus Design: Detailed Bills

Customer Supply

10E
11H STREET
12WN
13DUNTY

Your Account Number is **123456789**

Date of issue: 2 MARCH 10

Invoice number: 987654321

Useful contacts

For Accounts/General enquiries
contact the Customer Support
1850 372 372

For Energy/Network/Security
enquiries please contact
1850 372 999

For Complaints, please contact
1850 372 999

For Energy/Network/Security
enquiries please contact
1850 372 999

Your MPRN number is **M**

ED BC PRD

Electricity bill

Meter readings	Quantity and price	Description of charges	Amount €
Previous			
Current			
FF: DOMESTIC			
837 X	€0.1400	DAY UNITS	117.18
110 X	€0.2300	PEAK UNITS	25.30
140 X	€0.1000	NIGHT UNITS	14.00
59 DAYS @ €0.2520/DAY STANDING CHARGE			14.87
PUBLIC SERVICE OBLIGATION LEVY JAN			0.00
VAT @ 13.5% ON 171.35			23.13

Did you know?

You can pay this bill easily by phone with your Laser card.

Simply call 1850 372 372 from a landline or mobile phone.

For PISA CUSTOMER SUPPLY, call 1850 372 372.

For PAYMENT OPTIONS, call 1850 372 372.

For LASER, call 1850 372 372.

Billing period 1 JAN 10 - 28 FEB 10

Pay by 16 MAR 10

Total now due € 194.48

Customer Supply

Notes/Code

Total Cash

Chq., etc.

TOTAL €

Fuel Mix

For information on the fuel mix and environmental impact, please see reverse.

Shows how you are doing against your daily budget

Stimulus Design – In-home Display (IHD)

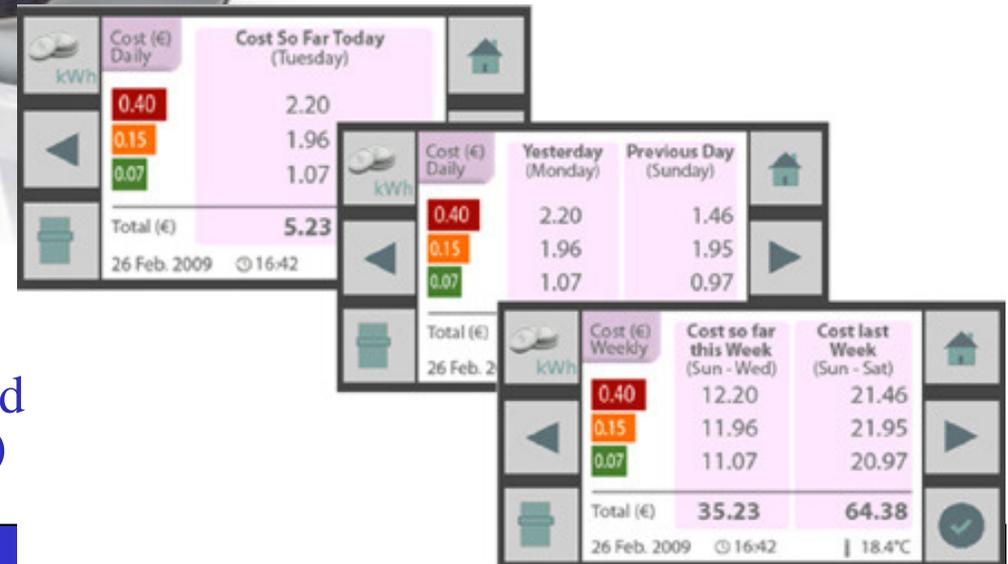


Indicates the current cost of electricity per hour (does not include standing charge and VAT)

Indicates price at peak (red), day (orange) and night (green) rates

Indicates how much your electricity has cost this month (does not include standing charge and VAT)

- Designed by industry work stream group & consumer focus groups
- Daily budget key element (personalised budget calculated prior to deployment)



CER Residential CBT Findings

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- The deployment of Time of Use tariffs and informational stimuli are found to reduce overall electricity usage by **2.5%** and peak usage by **8.8%**

	Overall	Peak Usage	Day Usage	Night Usage
Overall Change	-2.5%*	-8.8%*	-2.6%*	0.1%
* denotes results which are statistically significantly different from control group using a 90% confidence level.				

Residential CBT Findings continued...

- **Sustained effect on behaviour:**

No evidence of a diminution of effect overall when comparing the ratio of change between first six months with that of the second six months of the trial

	Overall Change	Peak Usage	Day Usage	Night Usage
First 6 months	-2.6%	-8.3%	-2.5%	-0.8%
Second 6 months	-2.4%	-9.3%	-2.7%	1.1%

- **Bill reductions:**

Participants adapted usage to realise average annual saving in the range of €18.20 to €21.60 on their bills





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Distributional Bill Impact

Across Consumers

(Note: VAT savings not included)

All	Age					
	18 - 25	26 - 35	36 - 45	46 - 55	56 - 65	65+
-€ 19.54	-€ 4.85	-€ 14.07	-€ 21.69	-€ 22.17	-€ 19.83	-€ 18.69

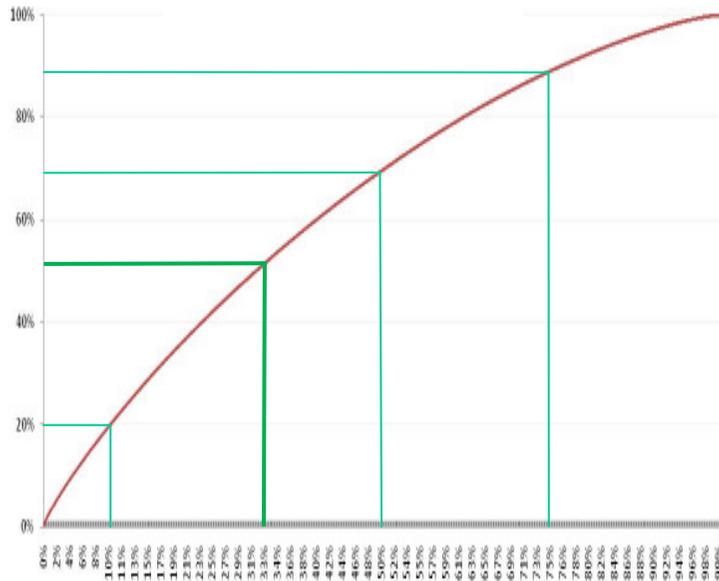
All	Social class					Single adult + children	FEA	Fuel Poor	
	AB	C1	C2	DE	F			Definition 1	Definition 2
-€ 19.54	-€ 21.60	-€ 19.93	-€ 18.14	-€ 18.45	-€ 19.40	-€ 18.47	-€ 18.96	-€ 27.38	-€ 24.37

All	Employment						
	An employee	Self-employed (with employees)	Self-employed (with no employees)	Unemployed (actively seeking work)	Unemployed (not actively seeking work)	Retired	Carer - Looking after relative or family
-€ 19.54	-€ 19.28	-€ 24.64	-€ 24.85	-€ 19.60	-€ 19.90	-€ 17.43	-€ 18.63

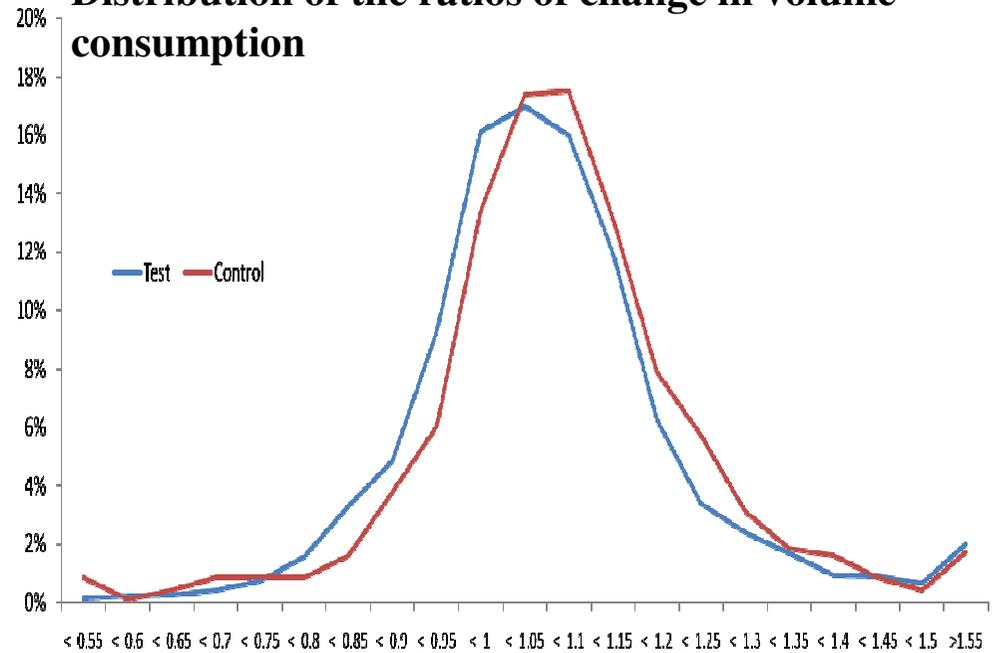
All	Household classification			Number in household					
	Alone	Adults	Adults+children	1	2	3	4	5	>=6
-€ 19.54	-€ 16.40	-€ 19.40	-€ 22.08	-€ 16.15	-€ 17.86	-€ 19.88	-€ 24.21	-€ 21.74	-€ 26.89

All	In during day		Owner/renter		
	Yes	No	Own	Social rent	Private rent
-€ 19.54	-€ 20.16	-€ 20.93	-€ 19.58	-€ 16.89	-€ 19.43

Cumulative Usage



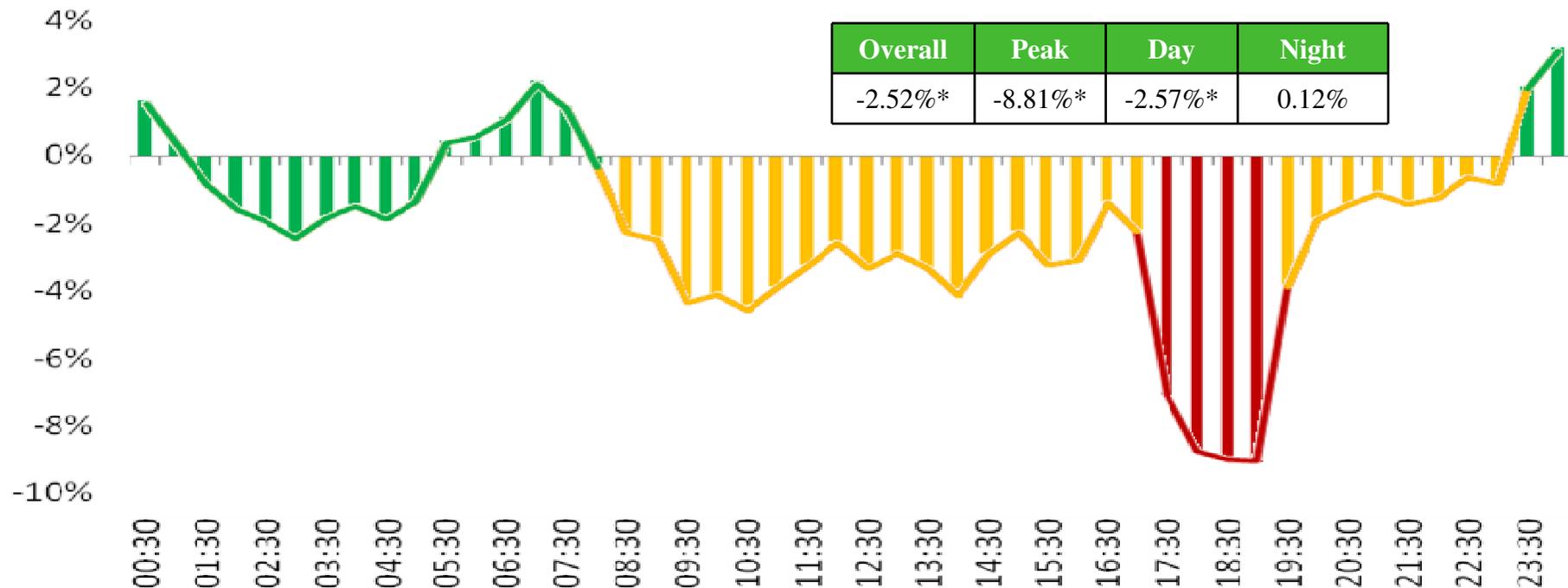
Distribution of the ratios of change in volume consumption



- Day usage comprises an average of 68%, night usage 23% and peak usage comprises 9% of overall consumption
- Average mean consumption during the trial period for the test group was 4,876 units
- A third of the participants accounted for 50% of the usage (during the trial period)

Daily Usage profile

- The percentage reduction in volume consumed in the pre-peak period is significantly higher compared to the post-peak period
- There is an increase in usage activity directly before the start of the day rate
- Barriers to further peak reduction relate to the difficulty of linking behaviour change to bill reduction
- Barriers to further shifting to night usage relate to safety and convenience



Time of Use Tariffs

- The implementation of time of use pricing is found to reduce both overall and peak usage across all tariff groups
- Excluding the weekend tariff, the largest reductions occur for Tariff B (-3.4%) and Tariff D (-10.9%) for overall and peak usage respectively – Tariff C yields the lowest overall reduction

Usage	All Tariff Groups and DSM Stimuli	All DSM Stimuli by Tariff Group				
		Tariff A %	Tariff B %	Tariff C %	Tariff D %	W/E Tariff %
Overall	-2.5*	-2.7*	-3.4*	-1.9*	-2.4*	-3.7*
Peak	-8.8*	-7.2*	-9.8*	-9.0*	-10.9*	-11.6*

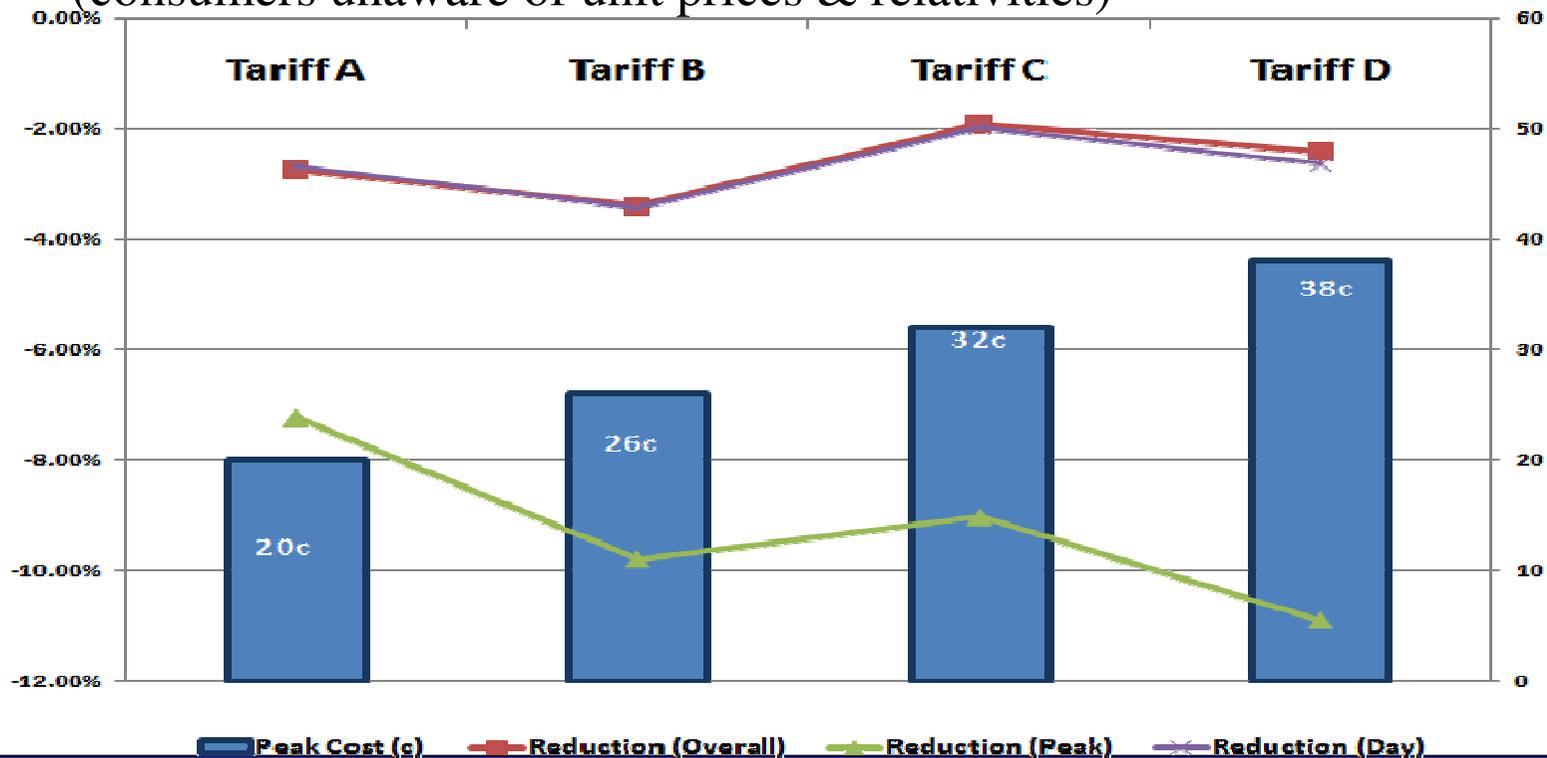
* denotes results which are statistically significantly different from control group using a 90% confidence level

- There is no single tariff group that stands out from the others as being superior in terms of reducing overall or peak usage
- Statistically, Tariff B is more effective than Tariff C in reducing overall usage. Tariff A is not as effective as tariff B, C, D and the weekend tariff in reducing peak usage



ToU Tariff Tipping Point

- All the tariffs deployed have resulted in a reduction in consumption but have a non linear relationship with peak price escalation
- Data from the Trial provides **no evidence of a tipping point**, with demand for peak usage having a weak relationship with price
- **Interpretation:** Move to ToU tariffs results in ‘step change’ in behaviour (consumers unaware of unit prices & relativities)



- Stimulus 3 (Bi-monthly bill, energy use statement and **electricity monitor / IHD**) is **most effective** at reducing both overall (-3.2%) and is statistically the most effective in reducing peak (-11.3%) usage

Usage	All Tariff Groups and DSM Stimuli	Tariff Groups A-D by DSM Stimulus			
		Bi-monthly Bill and energy use statement (Stimulus 1) %	Monthly Bill and energy use statement (Stimulus 2) %	Bi-monthly Bill, energy use statement and electricity monitor (Stimulus 3) %	Bi-monthly Bill, energy use statement and OLR incentive (Stimulus 4) %
Overall	-2.5*	-1.1	-2.7*	-3.2*	-2.9*
Peak	-8.8*	-6.9*	-8.4*	-11.3*	-8.3*

* denotes results statistically significantly different from control group using a 90% confidence level

- Similar reductions in overall and peak usage are found for Stimulus 2 (monthly bill and energy usage statement) and for Stimulus 4 (bi-monthly bill, energy usage statement and OLR incentive)
- Statistically, Stimulus 1 (bi-monthly bill combined with the energy usage statement) was not shown to be statistically significant in delivering overall energy reduction

Response over time

- There is a minor deceleration in impact between the first and second six monthly periods from a 2.6% to 2.4% reduction
- In contrast, in the case of Peak reduction shows an increase in impact from an 8.3% to 9.3% reduction

ToU Tariff Groups		Overall
Overall	1 st six months	-2.6
	2 nd six months	-2.4
Peak	1 st six months	-8.3
	2 nd six months	-9.3

- There is improvement over time in the case of the bi-monthly bill, monthly bill and the OLR incentive (all with energy usage statement and ToU tariff)
- The impact of the electricity monitor is seen to decline through the Trial, although it remains the single most effective stimulus for peak reduction

Stimulus Groups		Overall	All DSM Stimulus groups (in conjunction with Tariffs))			
			Bi-monthly bill and energy use statement %	Monthly bill and energy use statement %	Bi-monthly Bill, energy use statement and electricity monitor %	Bi-monthly Bill, energy use statement and OLR incentive %
Overall	1 st six months	-2.6	-0.8	-2.6	-4.0	-2.8
	2 nd six months	-2.4	-1.3	-2.8	-2.4	-3.1
Peak	1 st six months	-8.3	-6.4	-7.6	-11.7	-7.3
	2 nd six months	-9.3	-7.5	-9.2	-10.9	-9.3

CER Stimuli & Tariffs Inputted to CBA

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	SECOND SIX MONTHS OF SMART METER TRIAL			
	Night %	Day %	Peak %	Total %
Tariff A				
Bi-monthly bill and Energy statement	-0.4%	-2.6%	-8.1%	-2.6%
Monthly bill and Energy statement	-0.2%	-3.0%	-6.0%	-2.7%
Bi-monthly bill, Energy statement and electricity monitor	0.9%	-3.1%	-9.9%	-2.9%
Bi-monthly bill, Energy statement and overall load reduction incentive (OLR)	-2.8%	-4.1%	-7.2%	-4.1%
Tariff B				
Bi-monthly bill and Energy statement	-0.3%	-3.9%	-9.6%	-3.7%
Monthly bill and Energy statement	-0.3%	-4.2%	-11.5%	-4.1%
Bi-monthly bill, Energy statement and electricity monitor	2.1%	-1.8%	-8.4%	-1.6%
Bi-monthly bill, Energy statement and overall load reduction incentive (OLR)	0.5%	-3.0%	-10.4%	-3.0%



Post-trial Survey Findings

- 82% of Participants made some change to the way they used electricity.
- Fridge magnets and ToU stickers had a 80% recall.
- 91% felt the electricity monitor was effective in helping them reduce peak load.
- Barriers to moving more load to night included safety and convenience.
- Participants on FEA and the fuel poor exhibited the same level of change as other households.



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Gas Customer Behaviour Trial (CBT)

Design, Stimuli & Results





Experimental Design

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(6mth Benchmark Period / 12mth Active Test Period)

	Bi-monthly Detailed Bill	Monthly Detailed Bill	Bi-monthly Detailed Bill plus IHD	Bi-monthly Detailed Bill plus IHD plus Tariff	Total	
Stimulus	200	200	200	200	800	
Control Group					450	
					Total	1,250
					Total (including 35% fallout)	1,925



- Energy statements – similar to electricity CBT
- Monthly & Bi-monthly billing frequency
- In-home displays - similar to electricity CBT

- *Price Signal:*
 - No Time of Use Tariffs
 - ‘Variable’ (seasonal) tariff trialled



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Variable Gas Tariff

- Based on future and historical patterns of gas commodity prices
- A two-monthly change in tariffs
- All rates are applicable for the period 1st June 2010 to the 30th May 2011, subject to regulatory approved price changes in the standard tariff

Billing Period	Rate (cent per kWh, VAT exclusive)
June 2010 – July 2010	3.3
August 2010 – September 2010	3.3
October 2010 – November 2010	3.8
December 2010 – January 2011	4.6
February 2011 – March 2011	3.9
April 2011 – May 2011	3.4

Residential CBT Findings

- The deployment of stimuli and varying tariff are found to reduce overall gas consumption by a statistically significant **2.9%**;
- Each of the four stimuli combination tested were found to reduce usage as follows;

		Bi-monthly bill and energy usage statement %	Monthly bill and energy usage statement %	Bi-monthly bill, energy usage statement and IHD device %	Bi-monthly bill, energy usage statement, IHD device and Variable tariff %
Overall	-2.9*	-2.2%*	-2.8%*	-2.9%*	-3.6%*

* denotes results statistically significantly different from control group using a 90% confidence level.

Survey Findings

- Participants' assessment of the statement was good with 82% stating it was straightforward to understand and 57% stating that it helped them reduce the amount of gas they used;
- Most IHD participants perceived it was easy to use (84%) with a majority believing that it helped them to reduce the amount of gas used (62%) and made them more aware of the gas they used (74%)
- There is evidence that the value declined over time with 38% of participants stating that the IHD became less effective over time
- Text messages sent to the IHD were effective for those who recall receiving the message – however only 15% did recall the messages;



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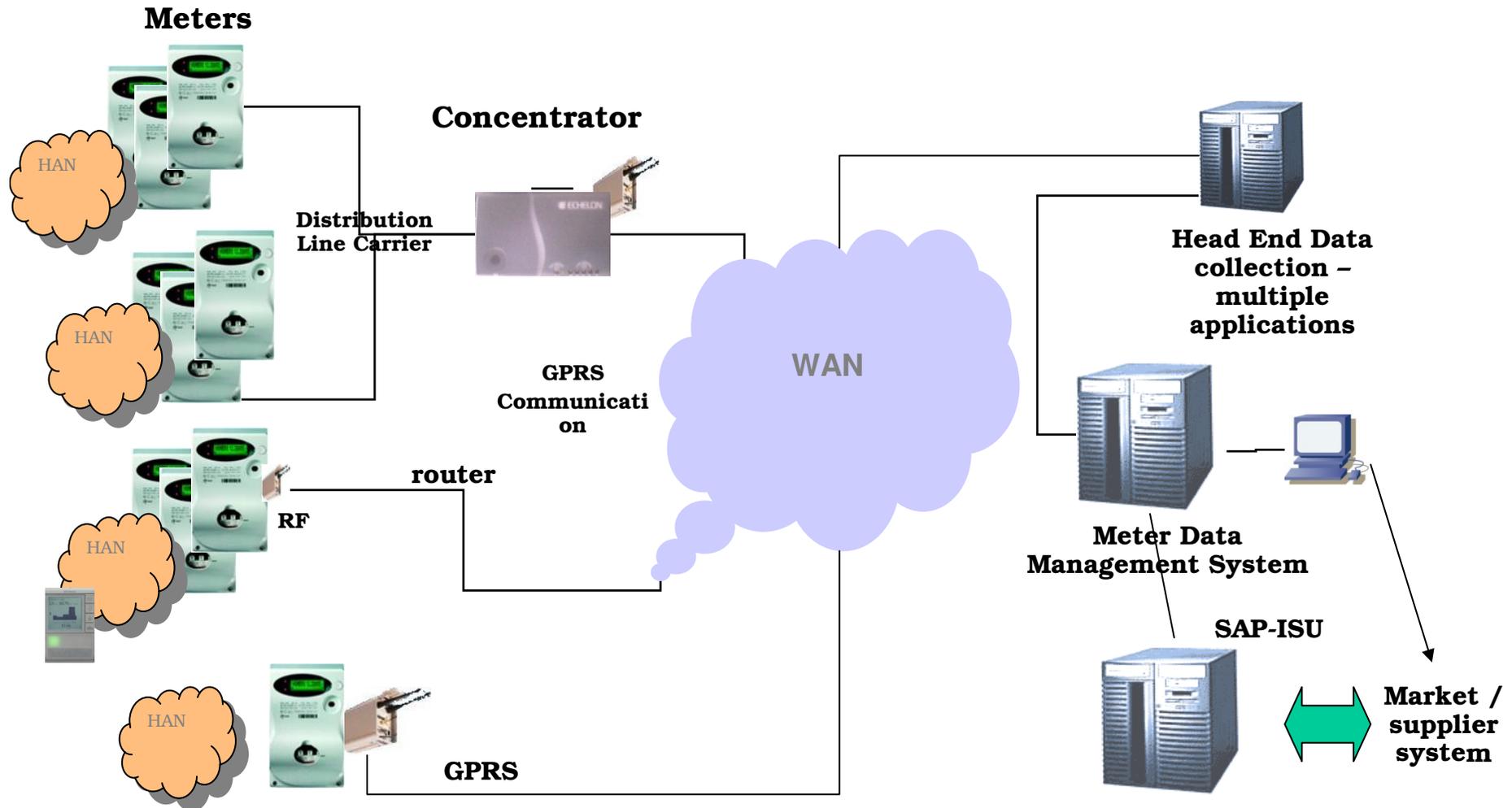
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Technology Trials Overview

Wide Area Network (WAN):
GPRS (CBT), PLC & RF Mesh

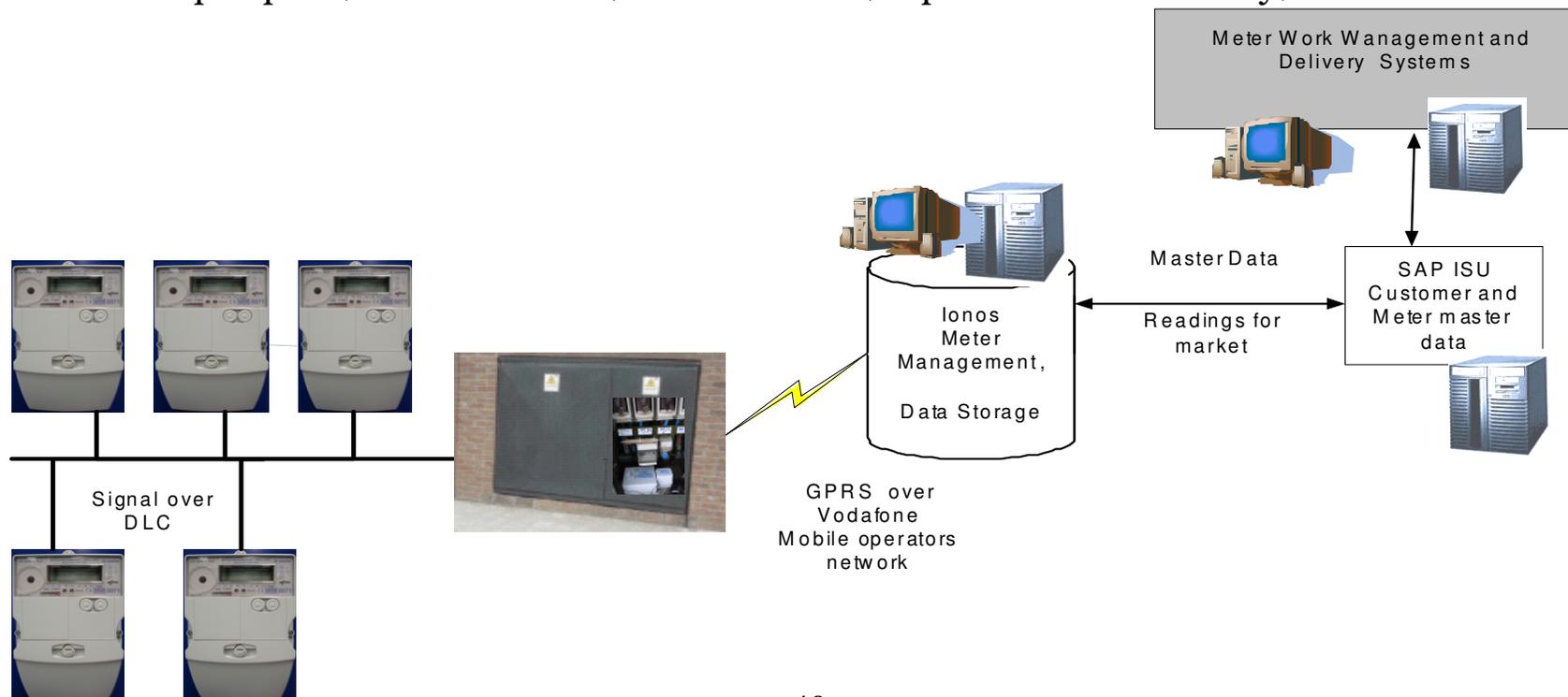


Smart Metering Infrastructure



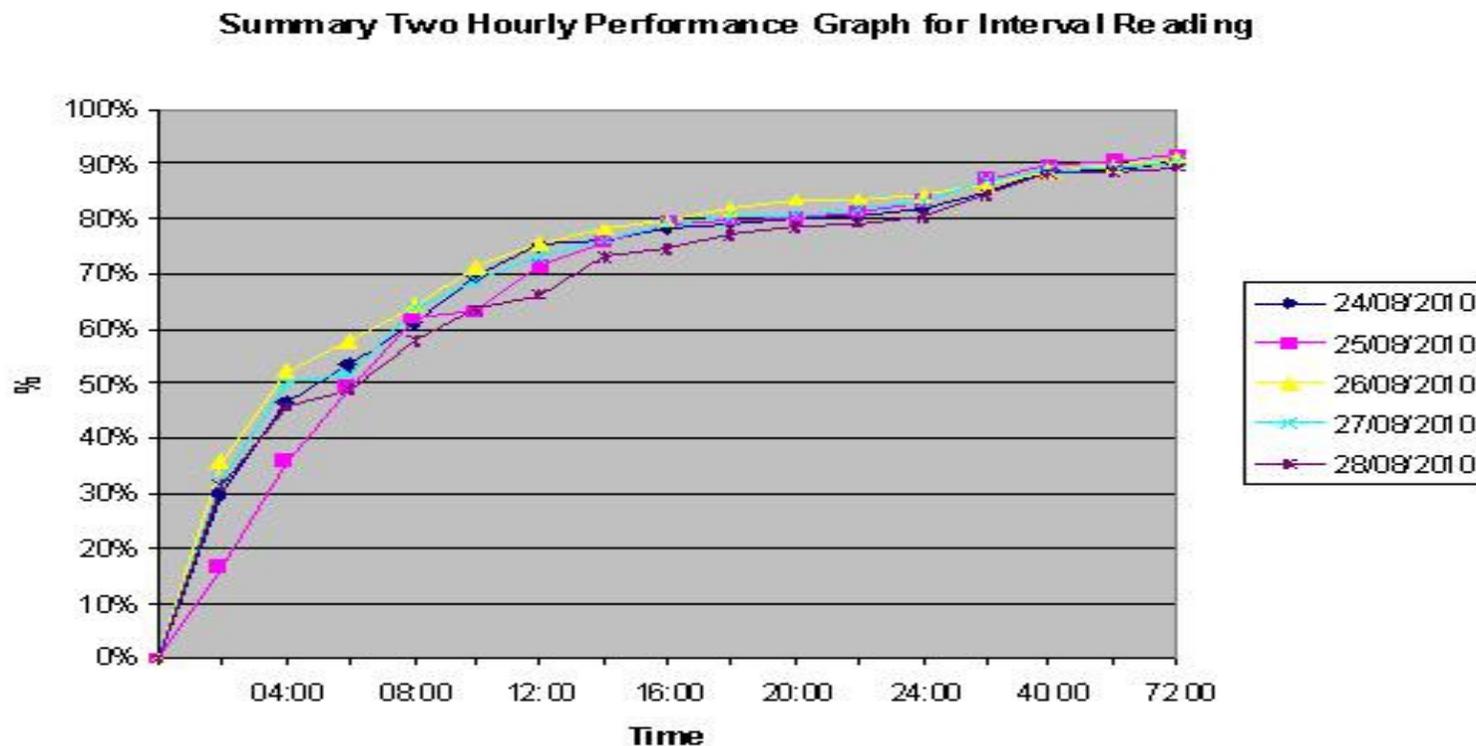
DLC Trial

- Standards based solution
- Favoured technology for most European smart metering projects to date
- Concentrator at MV substation manages and communicates with meters over low voltage
- 1.2Kbps speed, IEC standards, Two channels, repetition functionality, Cenelec A band

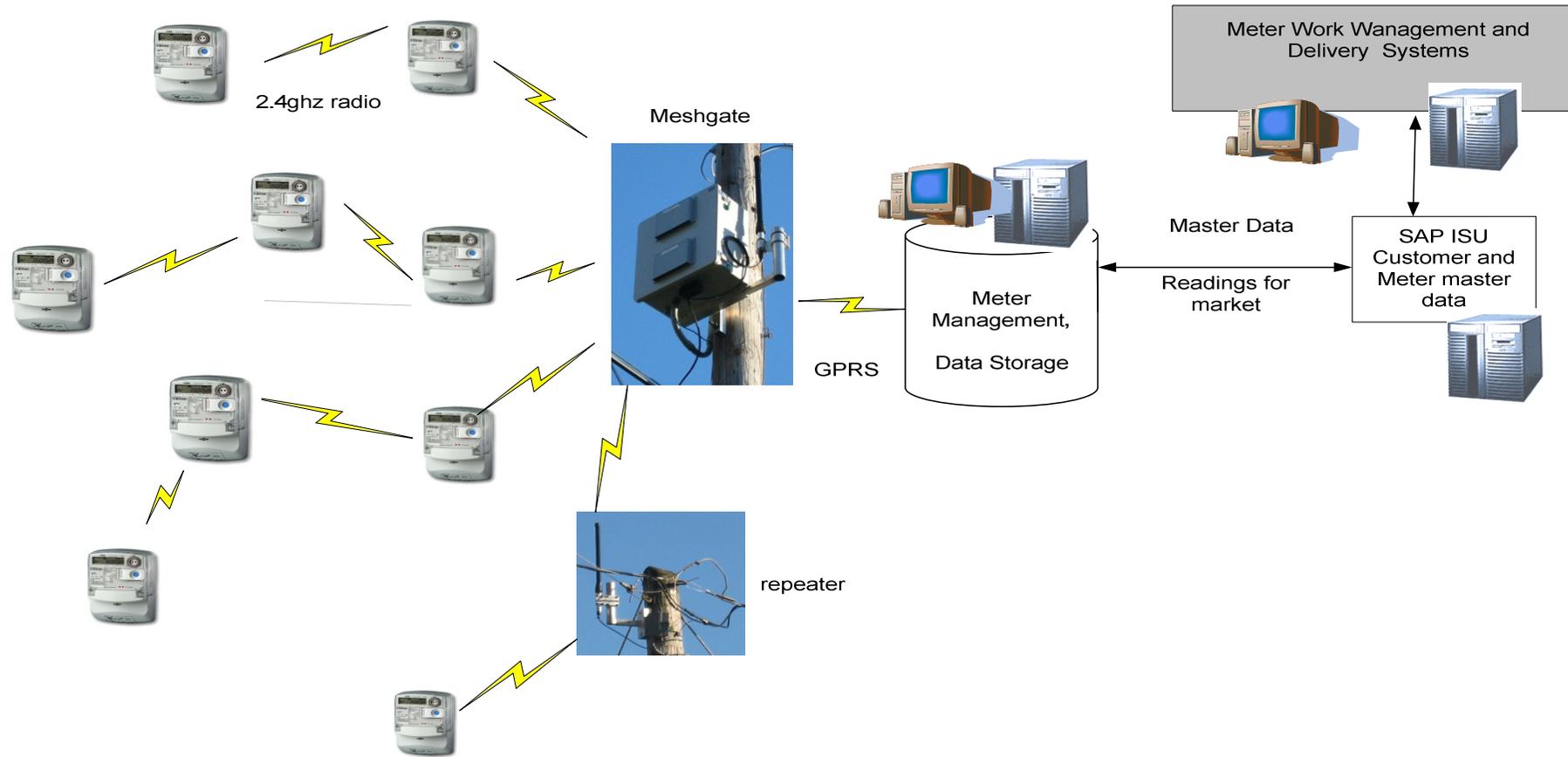


DLC Trial Results – Performance of Cyclical Functionalities

- Daily collection of interval data
 - 60% at opening of business, rising to 75% by end of day and over 90% within 2 working days
 - Big variation on performance depending on network with newer underground network performing best

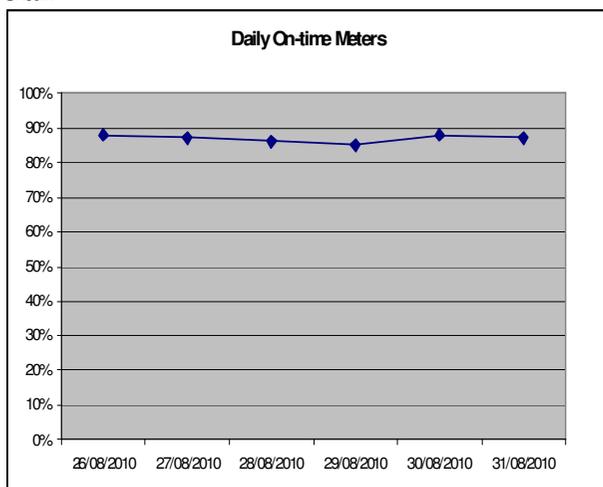


RF Mesh Overview

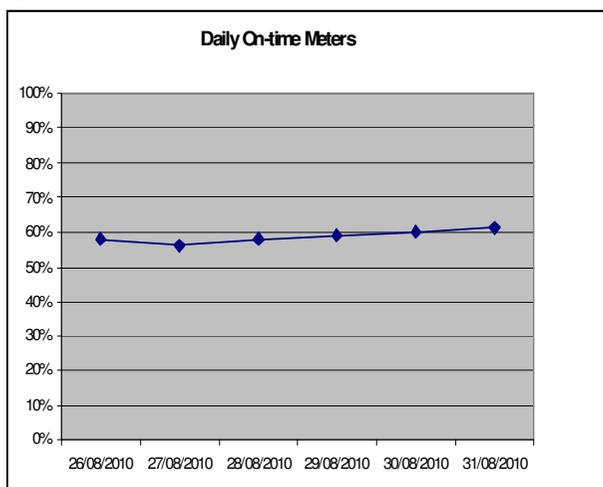


Overall Performance for Automated Functions.

Urban



Rural



Daily collection of interval data and register data;

- Overall performance on currently tuned network of 87% urban and 60% rural interval data next day 8.00am.
- Further work including additional repeaters, mesh gates and enhanced antennae may bring performance up to 95% overall

Gas Technology Trial

- Dual Fuel technology ‘proof of concept’ trial conducted jointly between ESBN & BGN
- 150 meters - 75 gas & 75 electricity
- Electricity meter acts as the hub for communications to and from the gas meter (wireless MBUS)
- Learned lessons:
 - from coordinated deployment process between two separate DSO’s
 - on the ongoing provisioning of data from the gas meter from ESBN to BGN
 - technology lessons of gas & electricity MBUS wireless deployment



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Electricity Cost Benefit Analysis (CBA) Overview



CBA Approach

- Objective of CBA is to estimate net cost/benefit of each roll-out option, compared to “no action” baseline
- Economic & Social Research Institute (ESRI) partnered the CER – modelling expertise 
- National smart metering rollout options & design/implementation assumptions for CBA were developed by the CER via consultation process
- Inputs from:
 - Customer Behaviour Trial (price & informational stimuli results)
 - Industry (DSO & Supplier costs & benefits) – reviewed by CER & independent 3rd party
 - Modelling by the CER of ‘Generation’ benefits (wholesale prices)

CER National Rollout Options

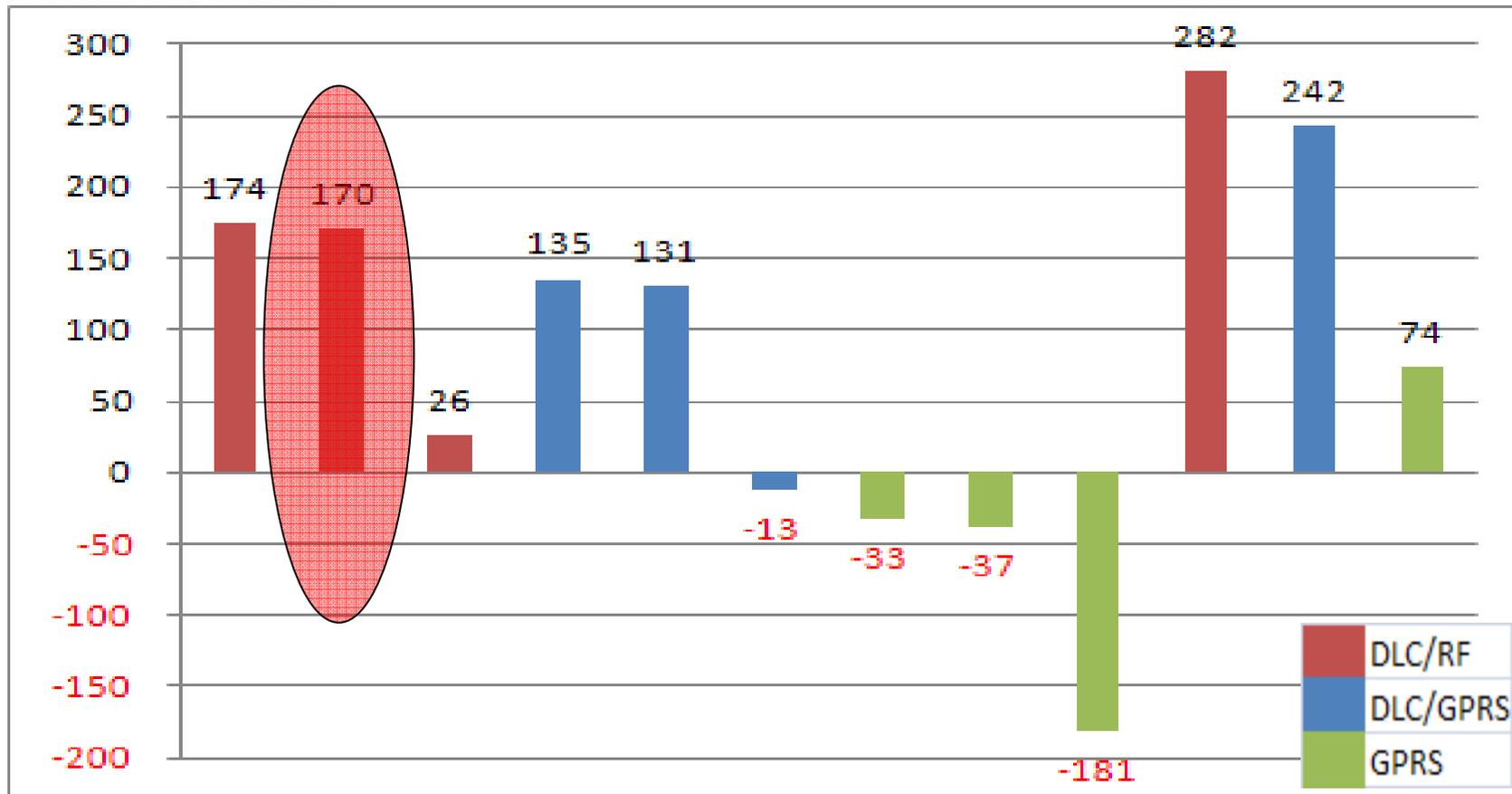
Electricity

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- 12 Options - vary by WAN technology & informational stimuli (ToU assumed for all options).

Option	Billing baseline	Billing scenario	Comm's	IHD
Option 1	Bi-monthly	Bi-monthly	PLC-RF	N
Option 2	Bi-monthly	Bi-monthly	PLC-RF	Y
Option 3	Bi-monthly	Monthly	PLC-RF	N
Option 4	Bi-monthly	Bi-monthly	PLC-GPRS	N
Option 5	Bi-monthly	Bi-monthly	PLC-GPRS	Y
Option 6	Bi-monthly	Monthly	PLC-GPRS	N
Option 7	Bi-monthly	Bi-monthly	GPRS	N
Option 8	Bi-monthly	Bi-monthly	GPRS	Y
Option 9	Bi-monthly	Monthly	GPRS	N
Option 10	Monthly	Monthly	PLC-RF	N
Option 11	Monthly	Monthly	PLC-GPRS	N
Option 12	Monthly	Monthly	GPRS	N

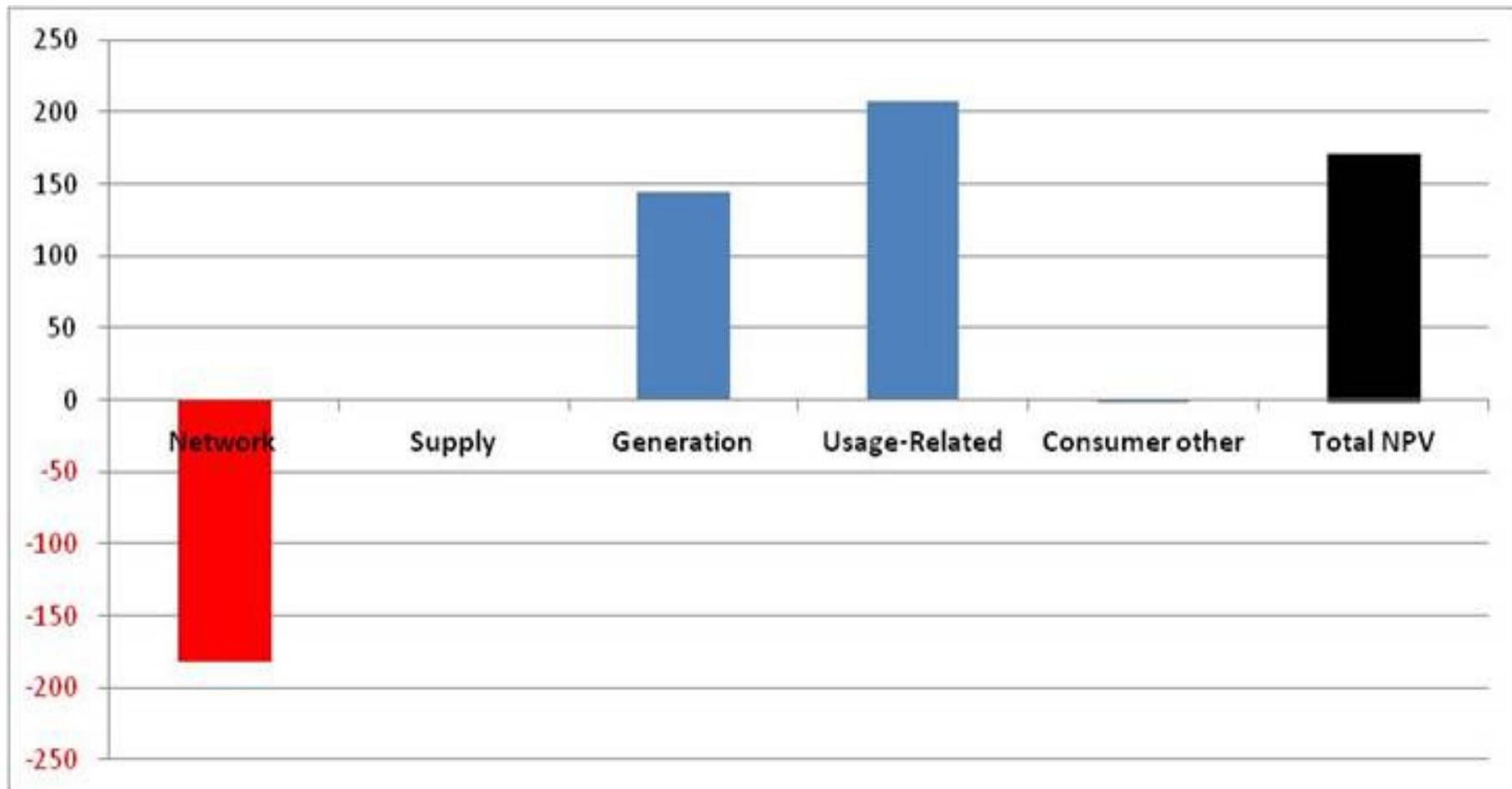
Total Electricity NPV (€m) by Option



- The estimated total NPVs for the 12 main national electricity smart metering rollout options analysed are generally positive, and often substantially so

CER Electricity NPV (€m) Breakdown by Component (Option 2)

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Option description	Billing baseline	Billing scenario	Comms	MID	NPV of net benefits (Millions)					
					Network	Supply	Generation	Usage-Related	Consumer other	Total NPV
Option 2	Bi-monthly	Bi-monthly	DLC-RF	Y	-181	1	144	207	-1	170

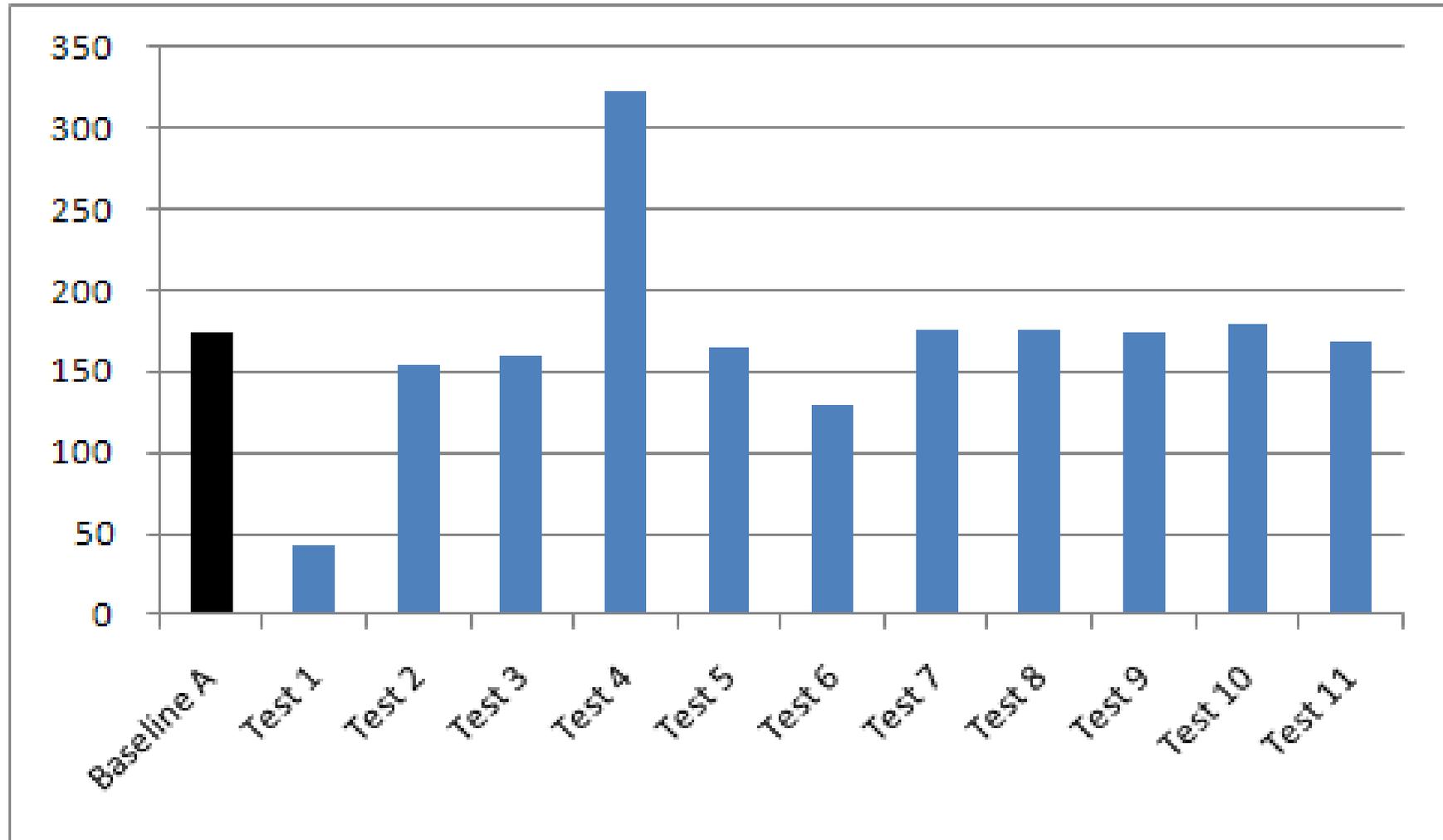
Main Sensitivity Tests

Baseline A	No change - DLC/RF with Bi-monthly billing and Tariff A
Test 1	8% discount rate rather than 4%
Test 2	10% increase in cost of smart meters
Test 3	10% increase in cost of meter installation
Test 4	Tariff B peak/day/night price structure rather than Tariff A
Test 5	High system implementation cost - suppliers (€12.5m rather than €9m per supplier)
Test 6	High billing system opex - suppliers (€2m rather than €800k per supplier-year)
Test 7	Headend cost low - network (€3.9m vs. €4.6m)
Test 8	MDMS cost low - network (€9.4m vs. €11.4m)
Test 9	MDMS cost high - network (€12.4m vs €11.4m)
Test 10	Programme mgmt cost low - network (€45m vs. €51.7m)
Test 11	Programme mgmt cost high - network (€58m vs €51.7m)

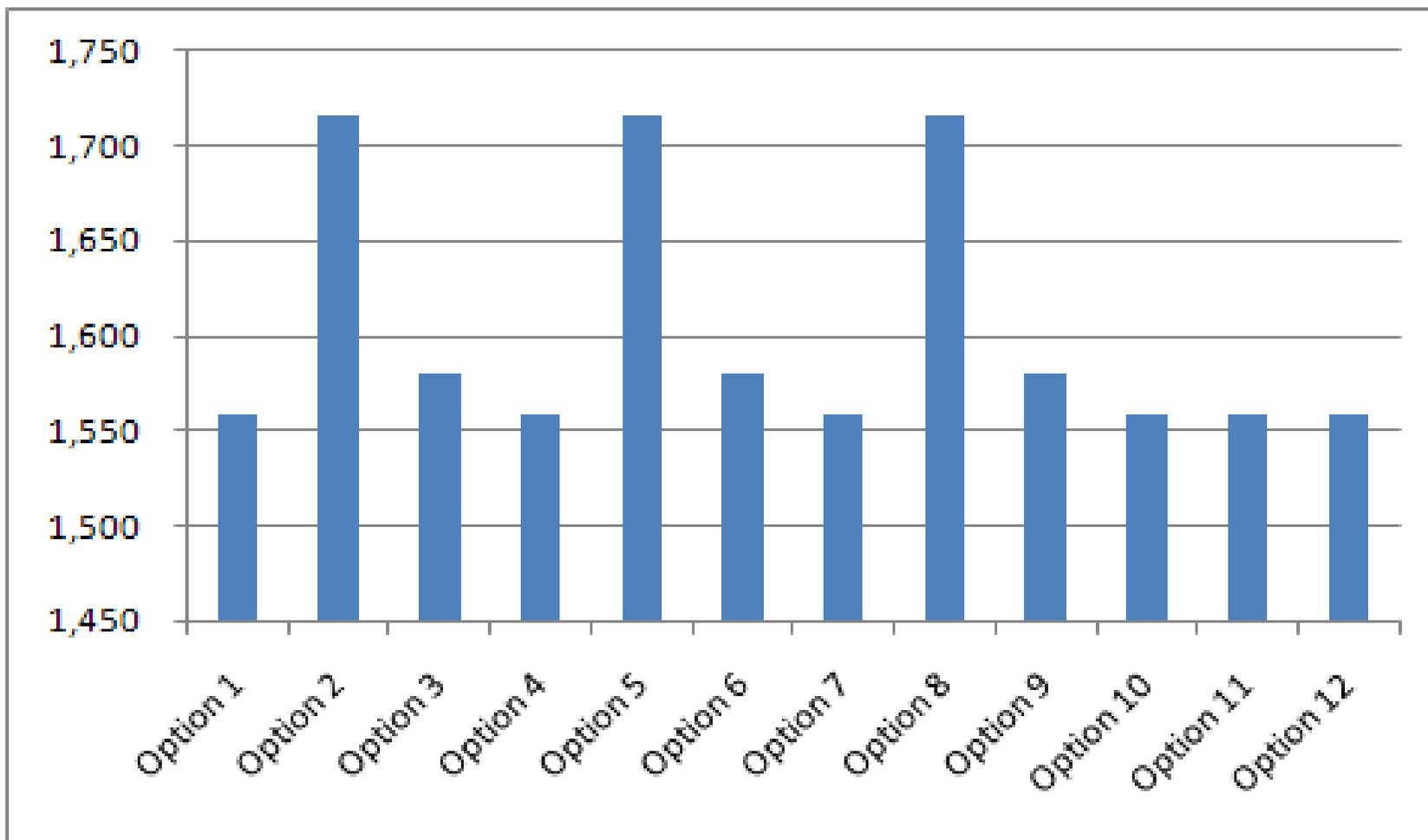


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Main Sensitivity Tests (NPV €m)



Total CO₂ Emissions Reductions (000 Tonnes)



Qualitative Benefits

- Smart Grid
- Micro Generation
- Electric Vehicles
- Smart Home
- Synergies with other Metering Requirements
(Gas / Water)





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Gas Cost Benefit Analysis (CBA) Overview

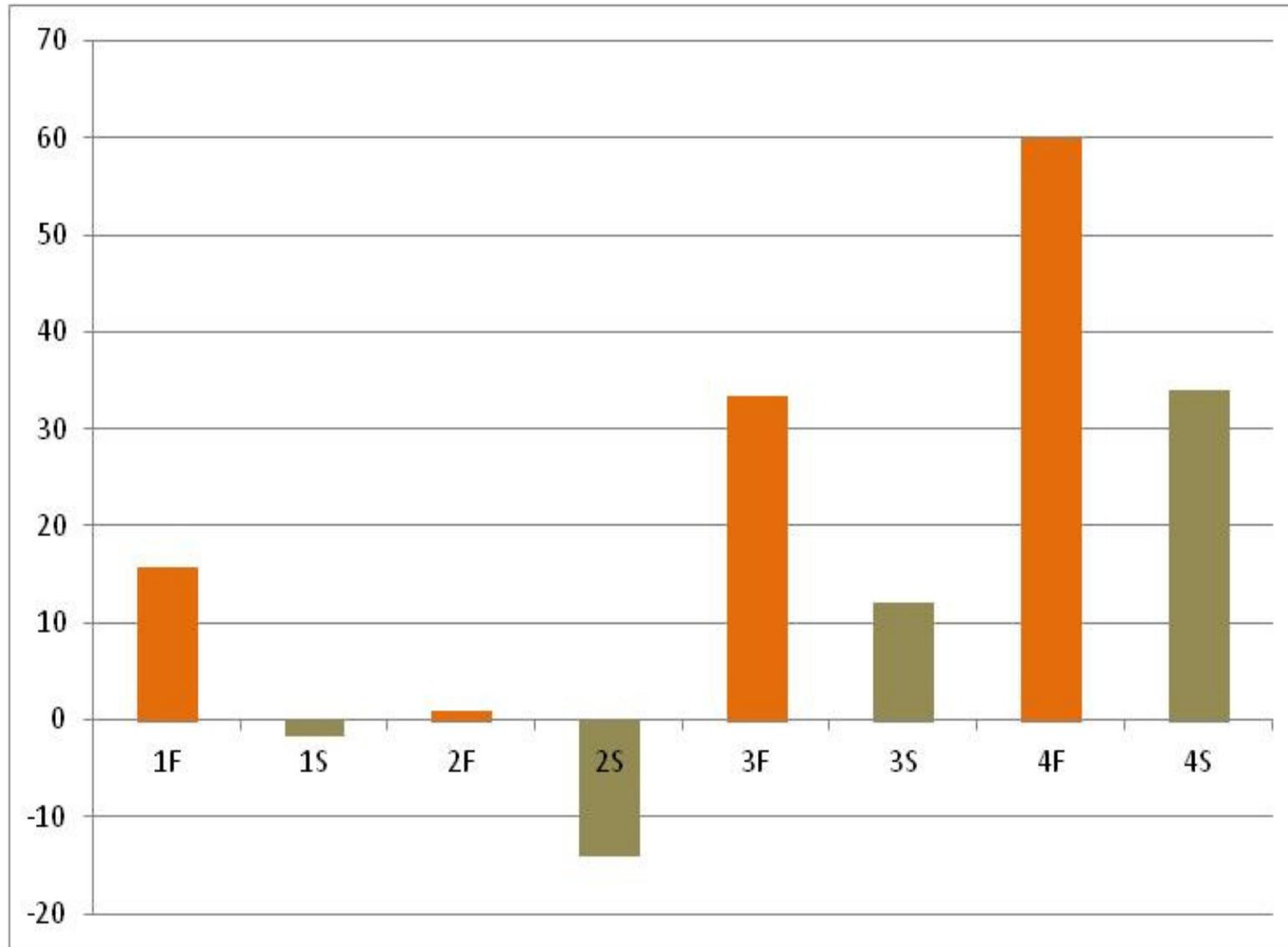
Incremental to Electricity CBA –
shared WAN & IHD assumed



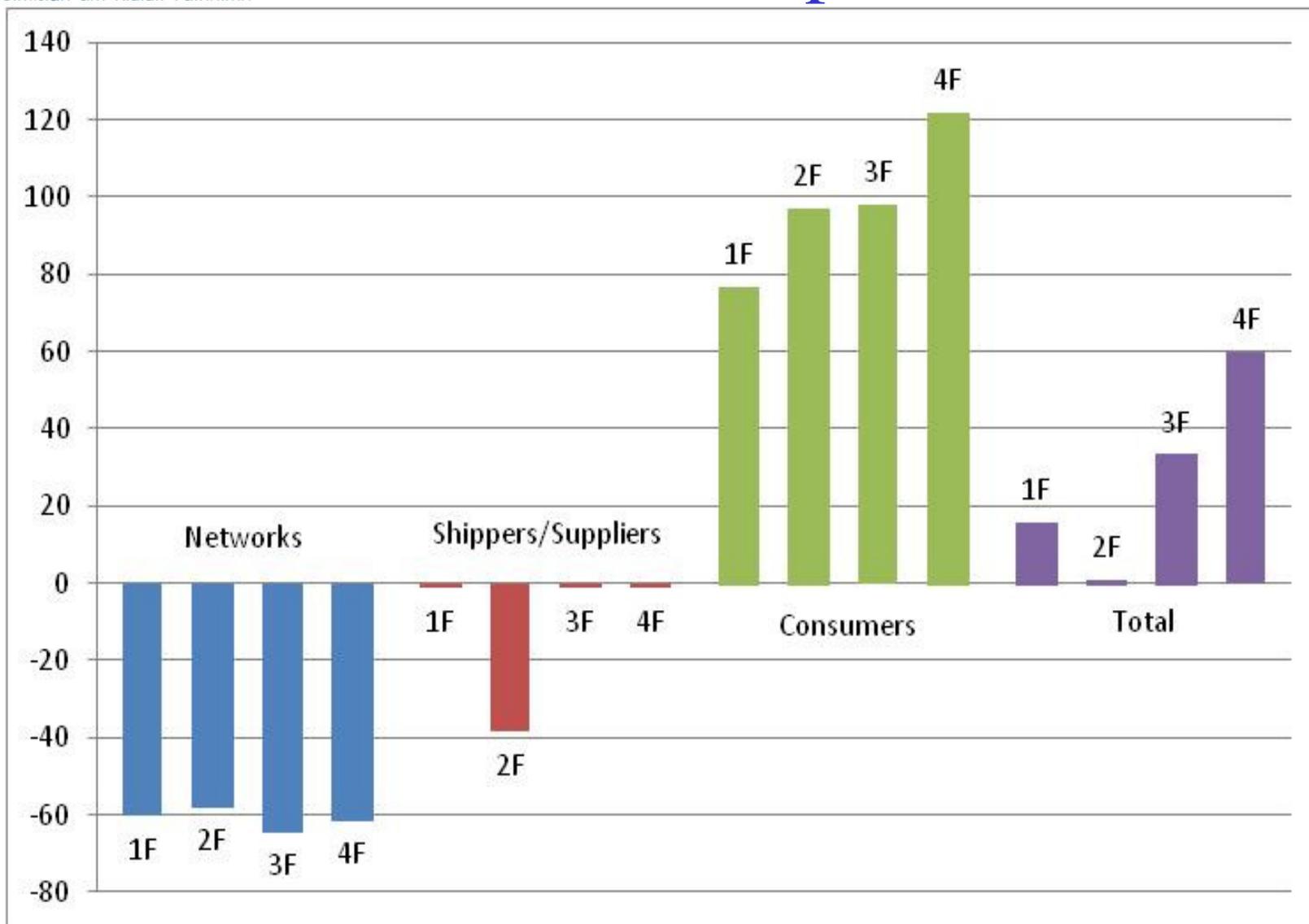
Energy saving scenario	Meter roll-out scenario	Scenario code	Total incremental NPV (EUR)
Bimonthly ES	Fast	1F	15,663,848
Bimonthly ES	Phased	1S	-1,612,759
Monthly ES	Fast	2F	938,003
Monthly ES	Phased	2S	-13,870,616
Bimonthly ES + IHD	Fast	3F	33,323,837
Bimonthly ES + IHD	Phased	3S	12,101,010
Bimonthly ES + IHD + VT	Fast	4F	59,879,967
Bimonthly ES + IHD + VT	Phased	4S	33,991,380



Total Gas NPV (€m) by Option



Gas NPV (€m) Breakdown by Component





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Next Steps

Consultation & Decision



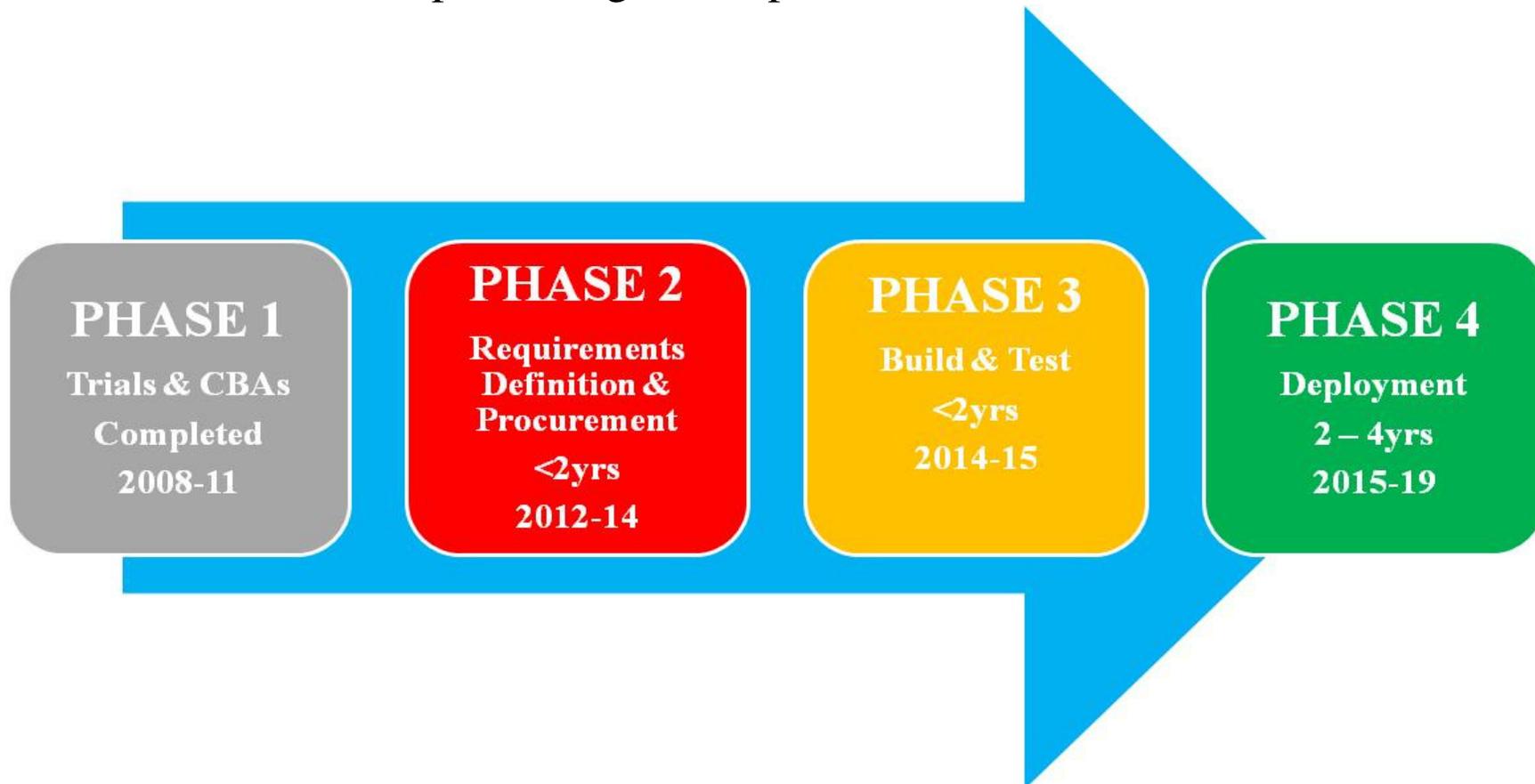
CER Consultation Overview

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- Consultation Nov/Dec 2011 – CER proposed to rollout electricity & gas smart metering nationally in a manner which:
 - Includes an **In-home Display** to give consumers more real-time information on both the cost and usage of electricity and gas.
 - Provides customers with **Smart Bills**, containing detailed consumption and cost information.
 - Involves suppliers offering **Time-of-Use Pricing** for all electricity consumers, facilitating a shift in electricity consumption to cheaper times of the day and giving more choice to customers.
 - Provides **prepayment** services as standard with smart metering, i.e. energy consumers will be able to automatically switch between prepay and bill pay
- Also includes proposals for the design and functionality requirements of the national Smart Meter roll-out, as well as the procurement model and high-level timelines involved.

Next Steps

- CER Decision Paper due shortly
- National Rollout (electricity & gas) high-level timeframe:
 - detailed work plan being developed.





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Questions?

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