SUSTAINABLE ENERGY AUTHORITY OF IRELAND

Changing consumer behaviour through information provision

21st June 2013

ICT for Environmental Regulation Workshop: NUIG

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Irish National Smart Metering project

National Smart Meter Plan

National Smart Meter Plan

- Smart Metering Project - Phase 1.
  - Established by the Commission for Energy Regulation (CER) in late 2007 to analyse the feasibility of implementing smart meters throughout Ireland.

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Commission for Energy Regulation
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BORD GÁIS NETWORKS

Bord Gáis Energy
think beyond

National Smart Meter Plan

ESB Networks

ESB electric Ireland

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ESRI

Utility Regulator
ELECTRICITY GAS WATER

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

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Customer Behaviour Trials

National Smart Meter Plan

Customer Behaviour Trials (CBTs)

- to ascertain the potential for smart metering enabled energy efficiency initiatives:
  - to effect measurable change in consumer behaviour
  - reductions in peak electricity demand
  - Reductions in overall energy (electricity & gas) use.
- Focus on Residential & SME (small-to-medium enterprise) electricity & gas consumers.
- Design - statistically robust
  - indicate national smart metering roll-out implications
  - inform the Cost Benefit Analysis.

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Customer Behaviour Trials

National Smart Meter Plan

Or, more simply...

Could Smart Meters save energy and change usage behaviour?

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a Smart Meter?

Meter in Outdoor Meter Box

Not my house!

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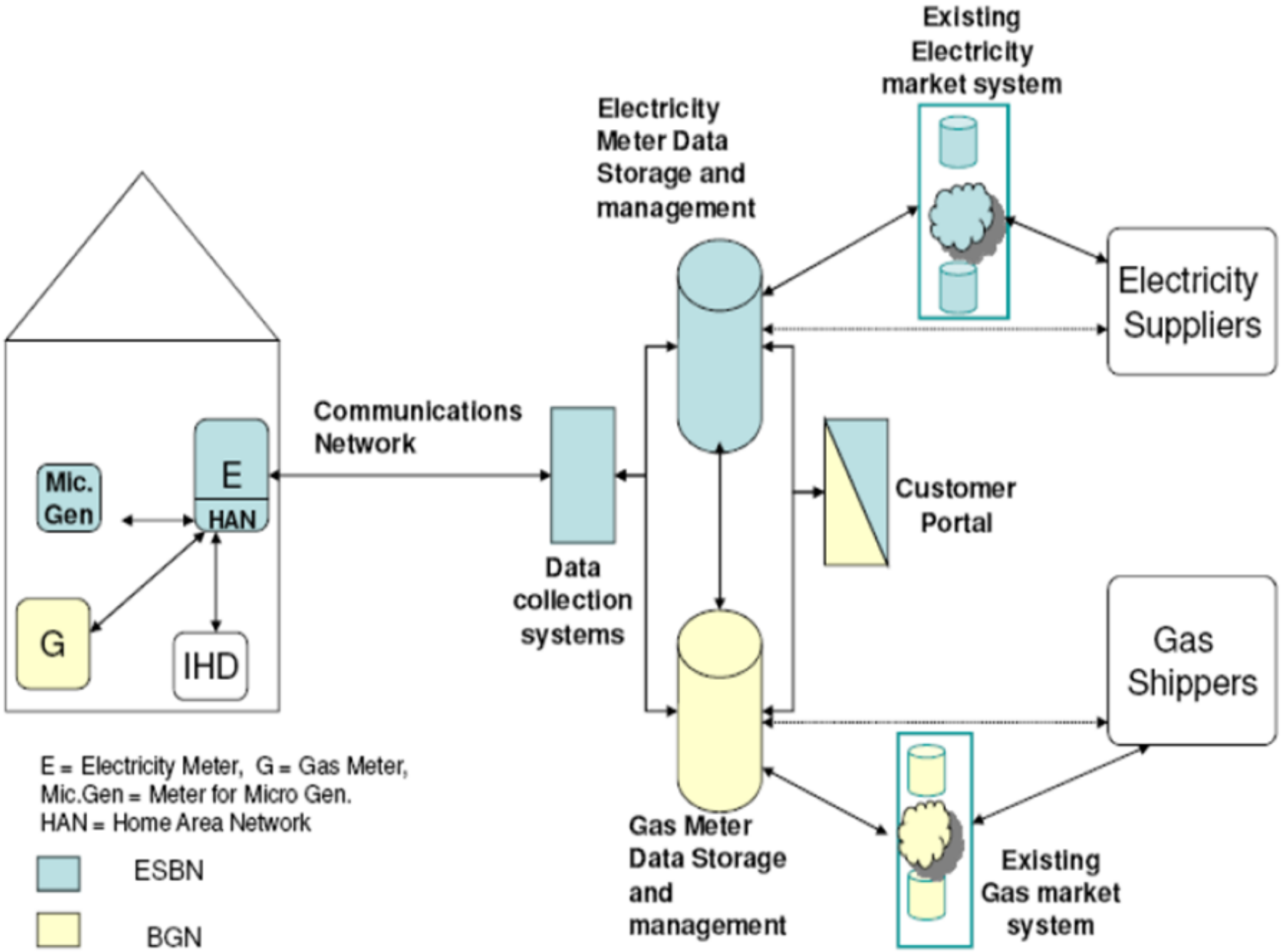
Existing
Electricity
market system
Electricity
Meter Data
Storage and
management
Electricity
Suppliers
Communications
Network
E
HAN
Mic.
Gen
G
IHD
Data
collection
systems
Customer
Portal
Gas
Shippers
Gas Meter
Data Storage
and
management
Existing
Gas market
system
E = Electricity Meter, G = Gas Meter,
Mic.Gen = Meter for Micro Gen.
HAN = Home Area Network
ESBN
BGN

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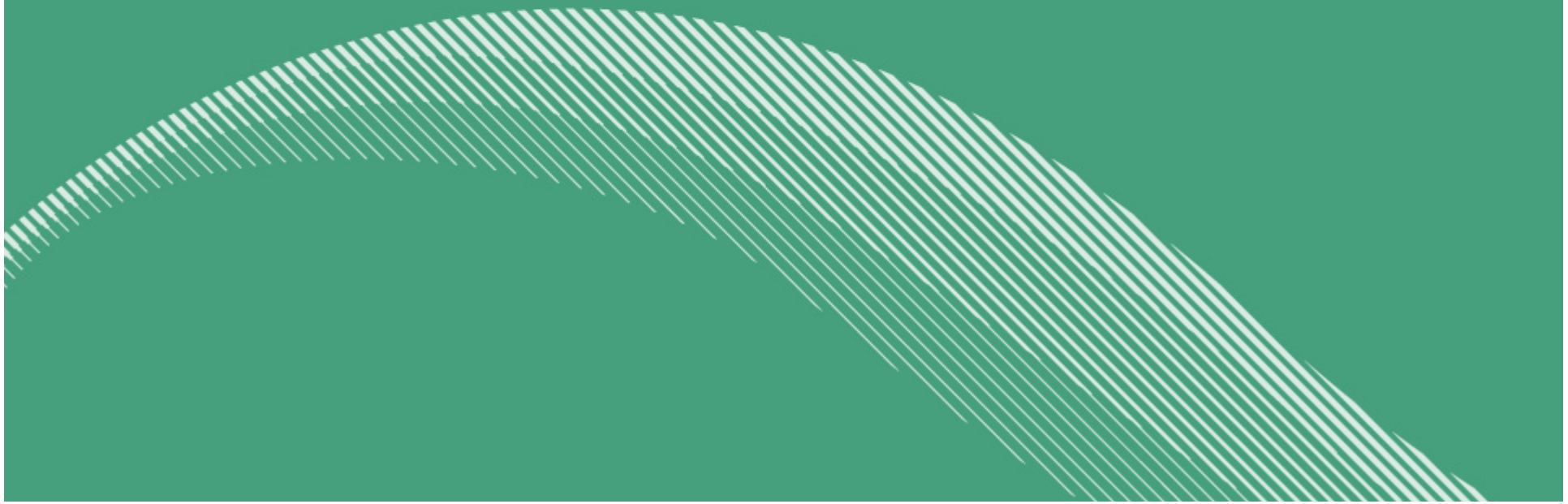
Design



National Smart Meter Trial 2009-2010

National Smart Meter Plan

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**

Tariff	Bi-monthly bill and energy usage statement	Monthly bill, and energy usage statement	Bi-monthly bill, energy usage statement and in-home display	Bi-monthly bill, energy usage statement, in-home display and variable tariff	Total
Existing Tariff	303	303	303	-	909
New Tariff	-	-	-	302	302
Control Group					681
	303	**303**	**303**	**302**	**1,892**

Detail Bills

National Smart Meter Plan

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.*

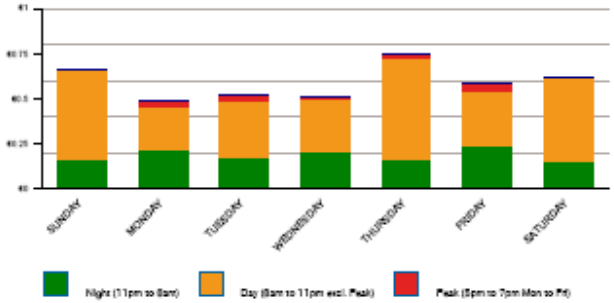
Hints and Tips

- 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 €8.01 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 €121.92 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



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

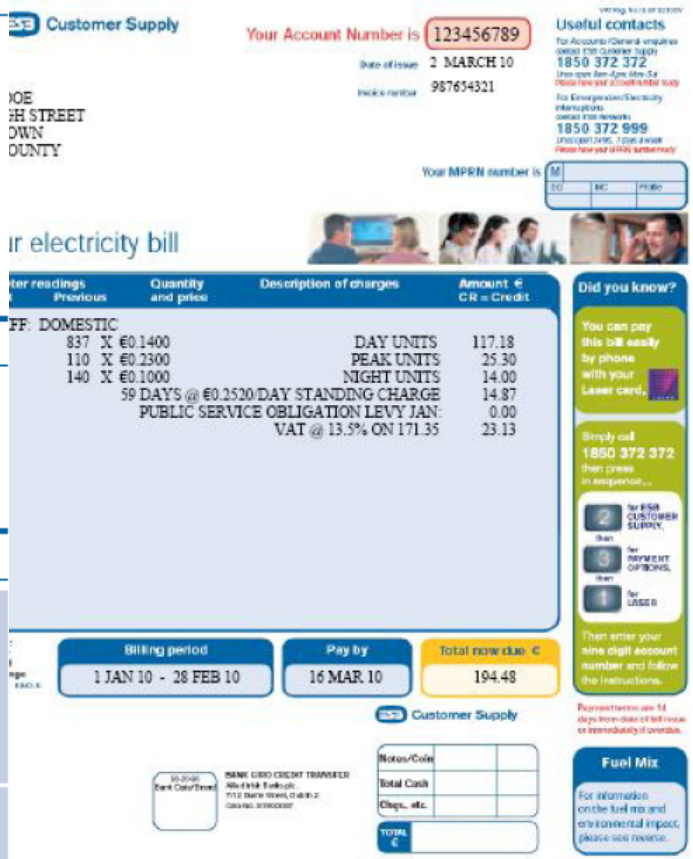
Goal THIS bill - Use less than	330	Units
Goal NEXT bill - Use less than	330	Units

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.

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.



Customer Supply

Your Account Number is 123456789

Date of issue 2 MARCH 10

Invoice number 987654321

Useful contacts

1850 372 372

1850 372 999

Your MPRN number is

ır electricity bill

ter readings Previous	Quantity and price	Description of charges	Amount € CR = Credit
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 then press in sequence...

Then enter your nine digit account number and follow the instructions.

Billing period	Pay by	Total now due €
1 JAN 10 - 28 FEB 10	16 MAR 10	194.48

Customer Supply

Notes/Coin

Total Cash

Chqs., etc.

TOTAL €

Fuel Mix

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

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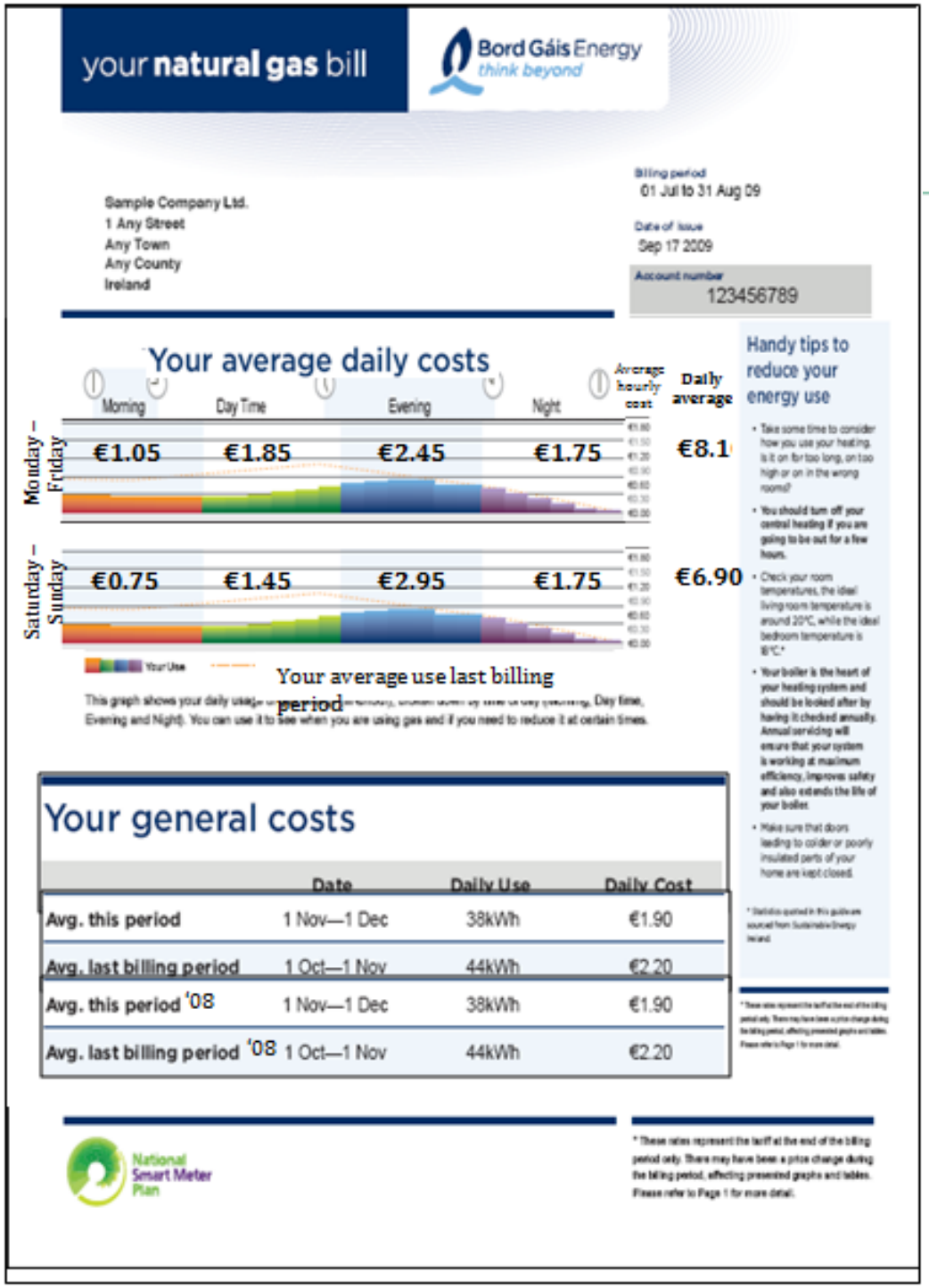
Domestic Time of Use Tariffs				
Vs. Normal Rate = 14.1 € cents/ kWh		**Week Night** 23.00 – 8.00	**Week Day** 8.00 – 17.00 19.00 – 23.00	**Peak** 17.00 – 19.00 (Monday to Friday), ex. holidays
Tariff A	Cents per kWh	12.00	14.00	20.00
Tariff B	Cents per kWh	11.00	13.50	26.00
Tariff C	Cents per kWh	10.00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

In Home Display

Stimulus Design: ToU Aids

Stickers and Fridge Magnets

Stimulus Design



Gas Trial – Stimulus Design

	June/July Cents per kWh	Aug/Sept Cents per kWh	Oct/Nov Cents per kWh	Dec/Jan Cents per kWh	Feb/Mar Cents per kWh	Apr/May Cents per kWh
Unit Rate excl. VAT	3.3c	3.3c	3.8c	4.6c	3.9c	3.4c

Normal rate = 3.932c

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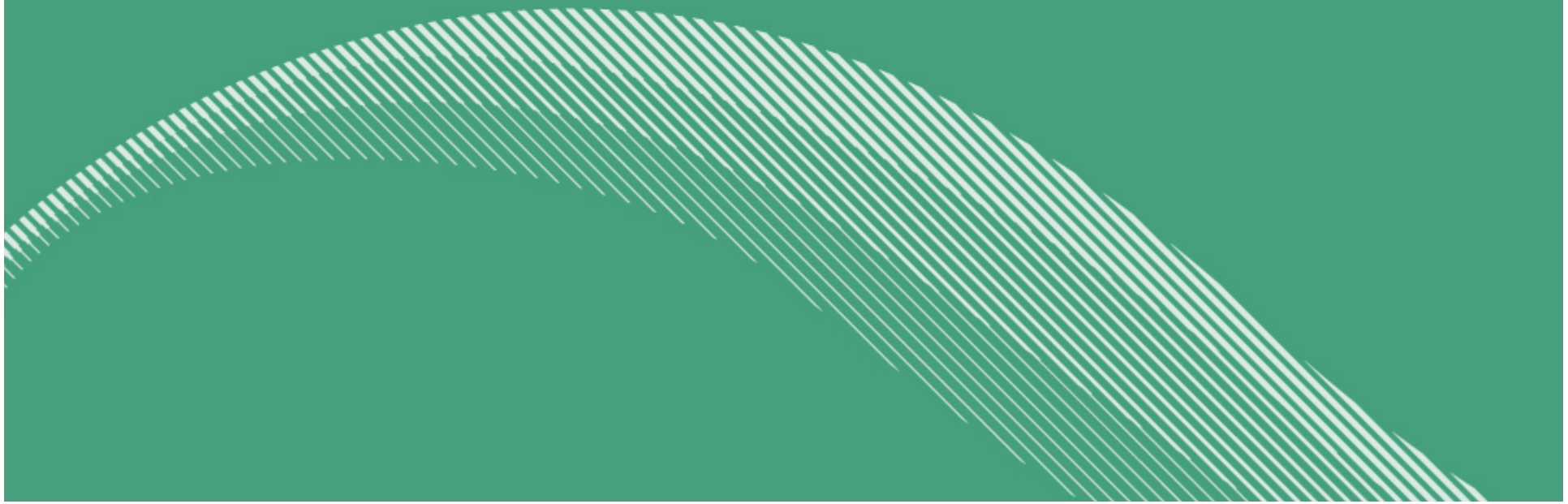
Ireland – National Smart Meter Plan – Results



Overall Reduction - Electricity

	Overall	Peak Usage	Day Usage	Night Usage
Overall Change	-2.52%*	-8.81%*	-2.57%*	0.12%

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

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By Stimuli

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					

	1st 6 Months				2nd 6 Months			
	Overall	Peak Usage	Day Usage	Night Usage	Overall	Peak Usage	Day Usage	Night Usage
Overall Change	-2.60%	-8.32%	-2.47%	-0.84%	-2.44%	-9.29%	-2.66%	1.09%

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Gas Trial – Main Results

Usage	All DSM Stimuli Groups
Overall	**-2.9***
* denotes results which are statistically significantly different from control group using a 90% confidence level.	

		Bi-monthly bill / energy statement (Stimulus 1)	Monthly bill / energy statement (Stimulus 2)	Bi-monthly bill / energy statement / IHD (Stimulus 3)	Bi-monthly bill / energy statement / IHD / Variable tariff (Stimulus 4)%
Overall	**-2.9***	**-2.2%***	**-2.8%***	**-2.9%***	**-3.6%***
* denotes results statistically significantly different from control group using a 90% confidence level.					

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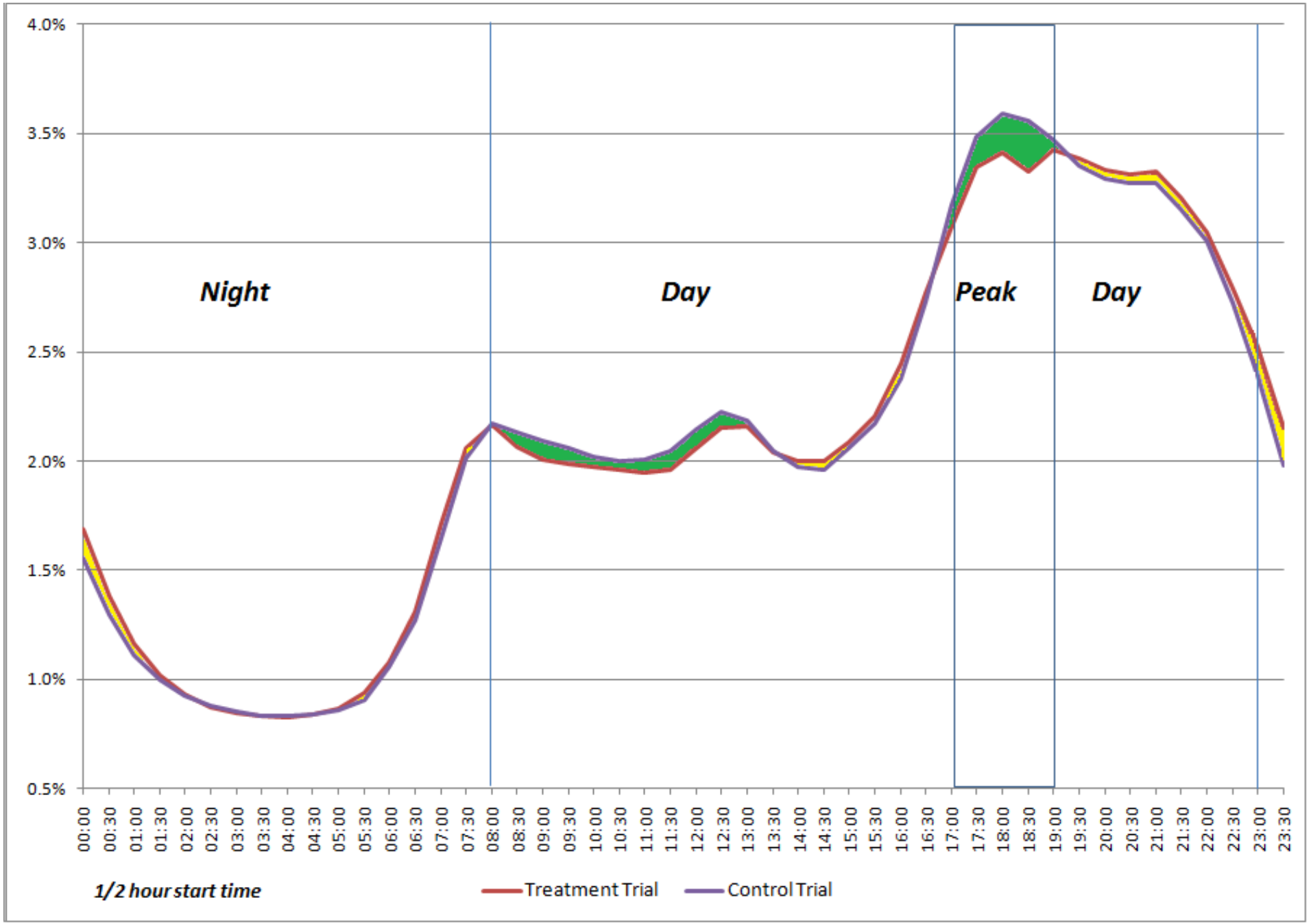

% usage over day

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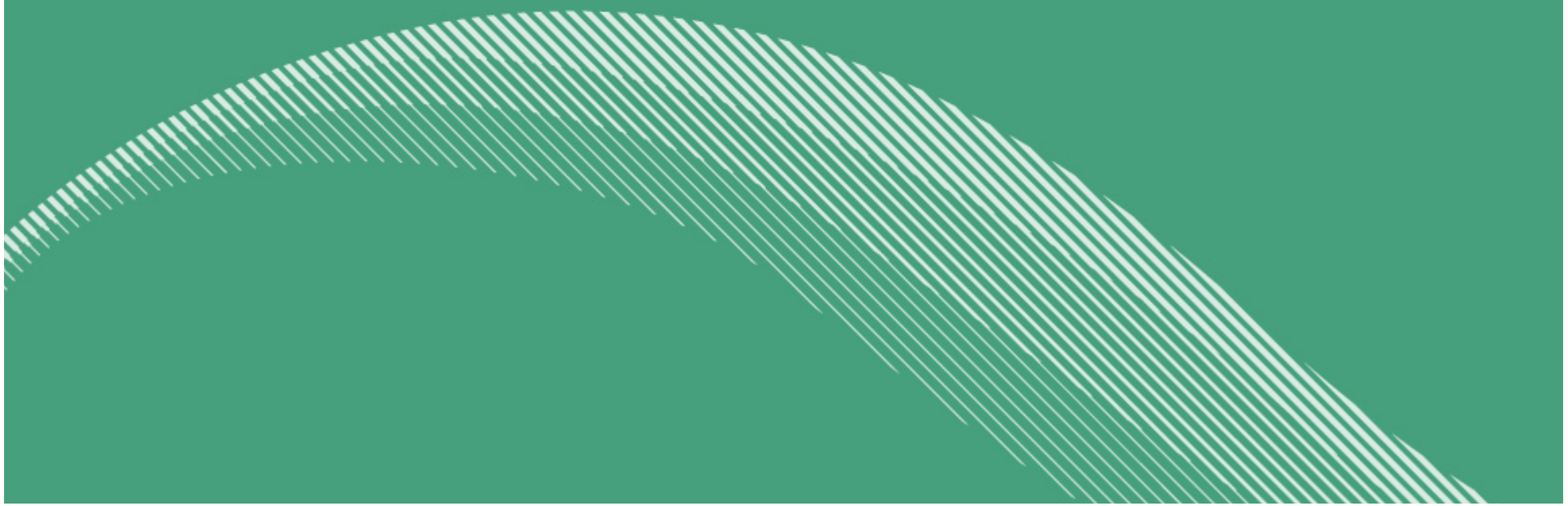
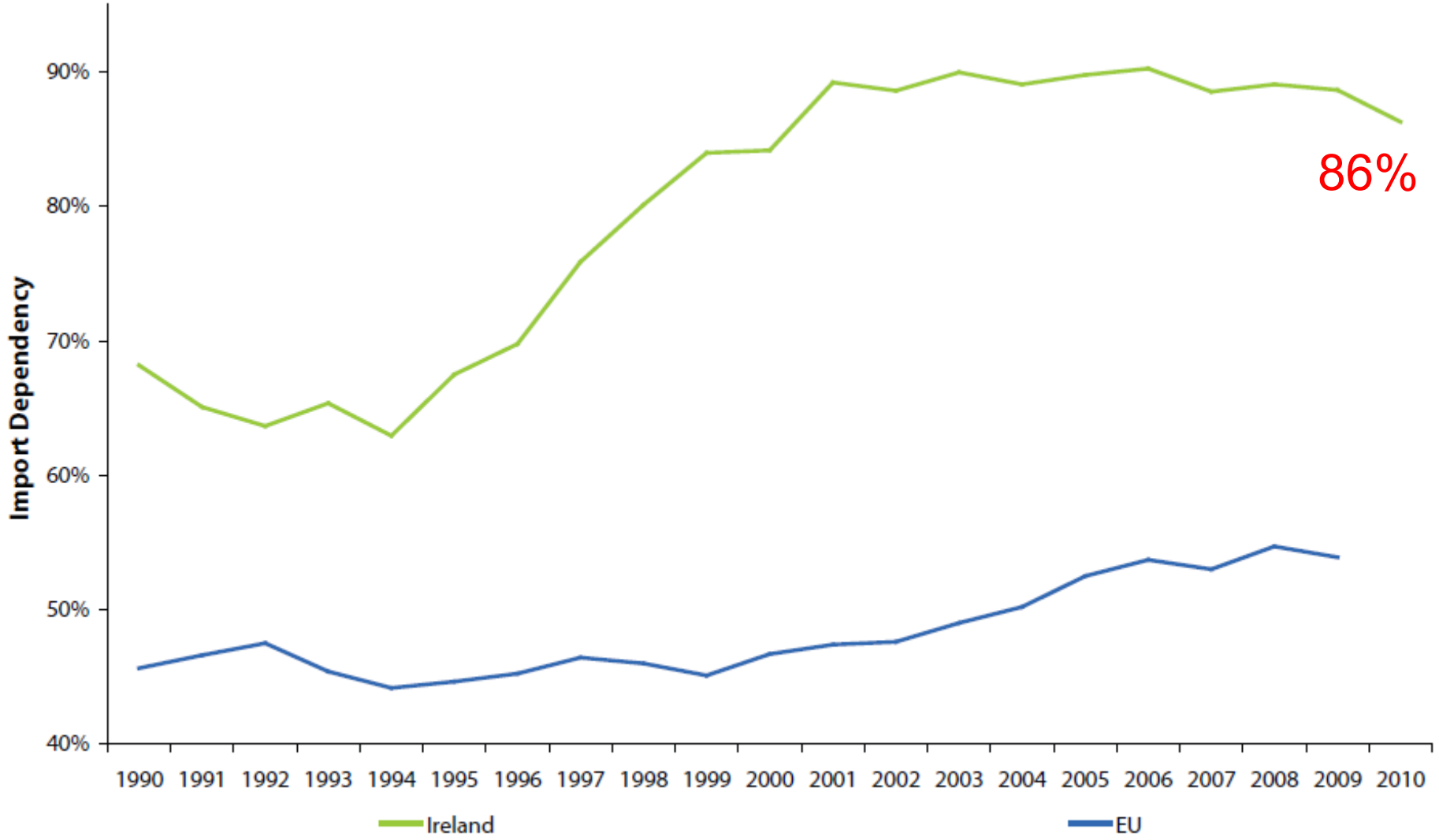
Is this relevant?



Ireland – Energy Supply

Figure 31 *Import Dependency of Ireland and EU*



Source: SEAI and Eurostat

Ireland: Energy Policy Drivers

Renewable energy

16% of total energy by 2020

40% electricity by 2020
12% heat by 2020
10% transport by 2020

National Renewable Energy Action Plan - EU 20/20/20 Strategy

GHG Reduction

20% greenhouse gas reduction in the non-EU ETS sectors

Energy efficiency

20% energy savings across all sectors by 2020

National Energy Efficiency Action Plan - EU 20/20/20 strategy

Electric vehicles

10% of all vehicles to be electric by 2020 (target)

~230,000 electric vehicles

Energy White Paper 2007

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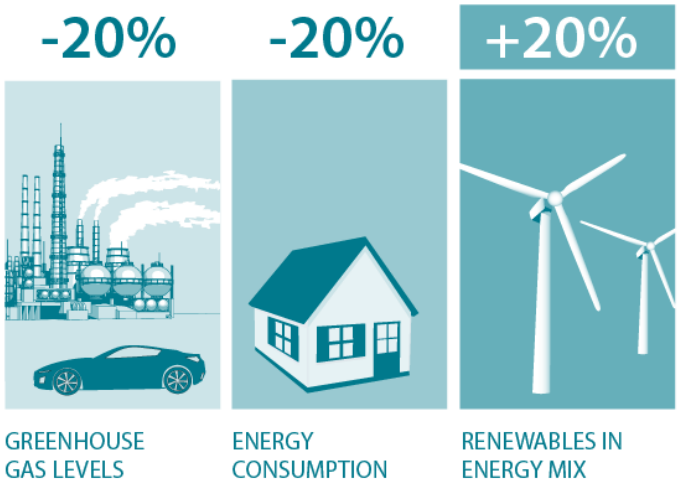
National Energy Efficiency Action Plan / National Renewable Energy Action Plan



RENEWABLE ELECTRICITY

40%

TRANSPORT ENERGY

10%

ENERGY EFFICIENCY

20%

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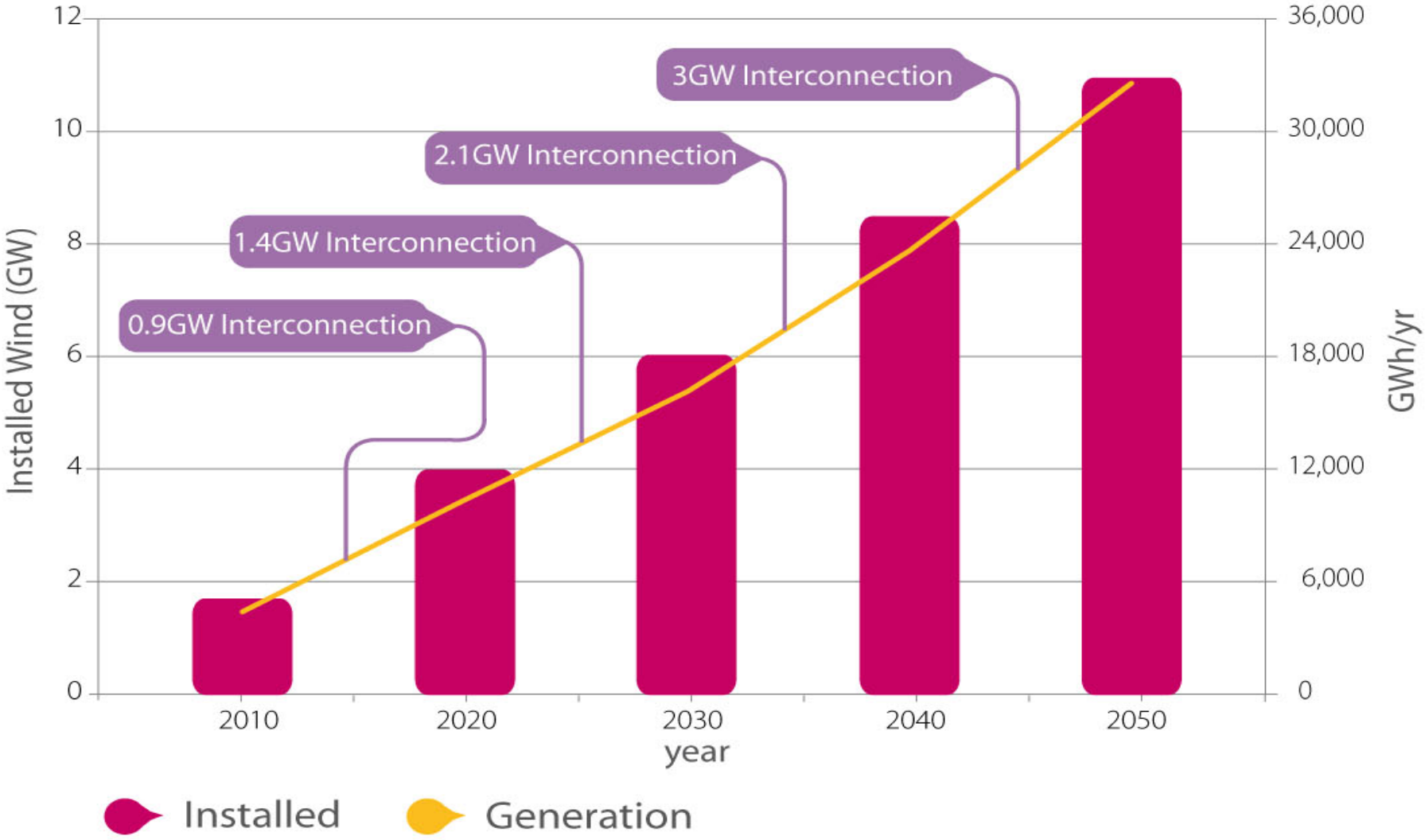
Electricity from Onshore Wind



Source: SEAI Smart Grid Roadmap 2050

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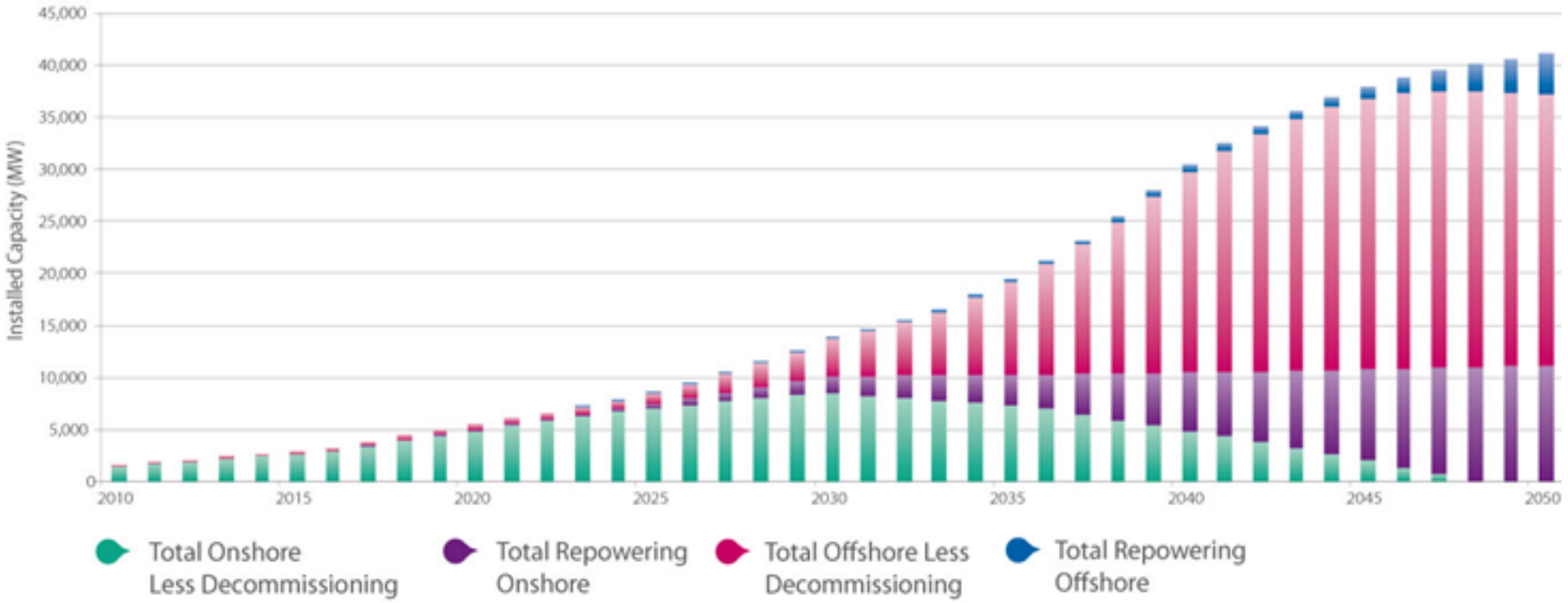
Wind – Installed Potential

Cumulative Capacity with Repowering of Onshore and Offshore Wind Installations to 2050



Source: SEAI Wind Energy Roadmap 2050

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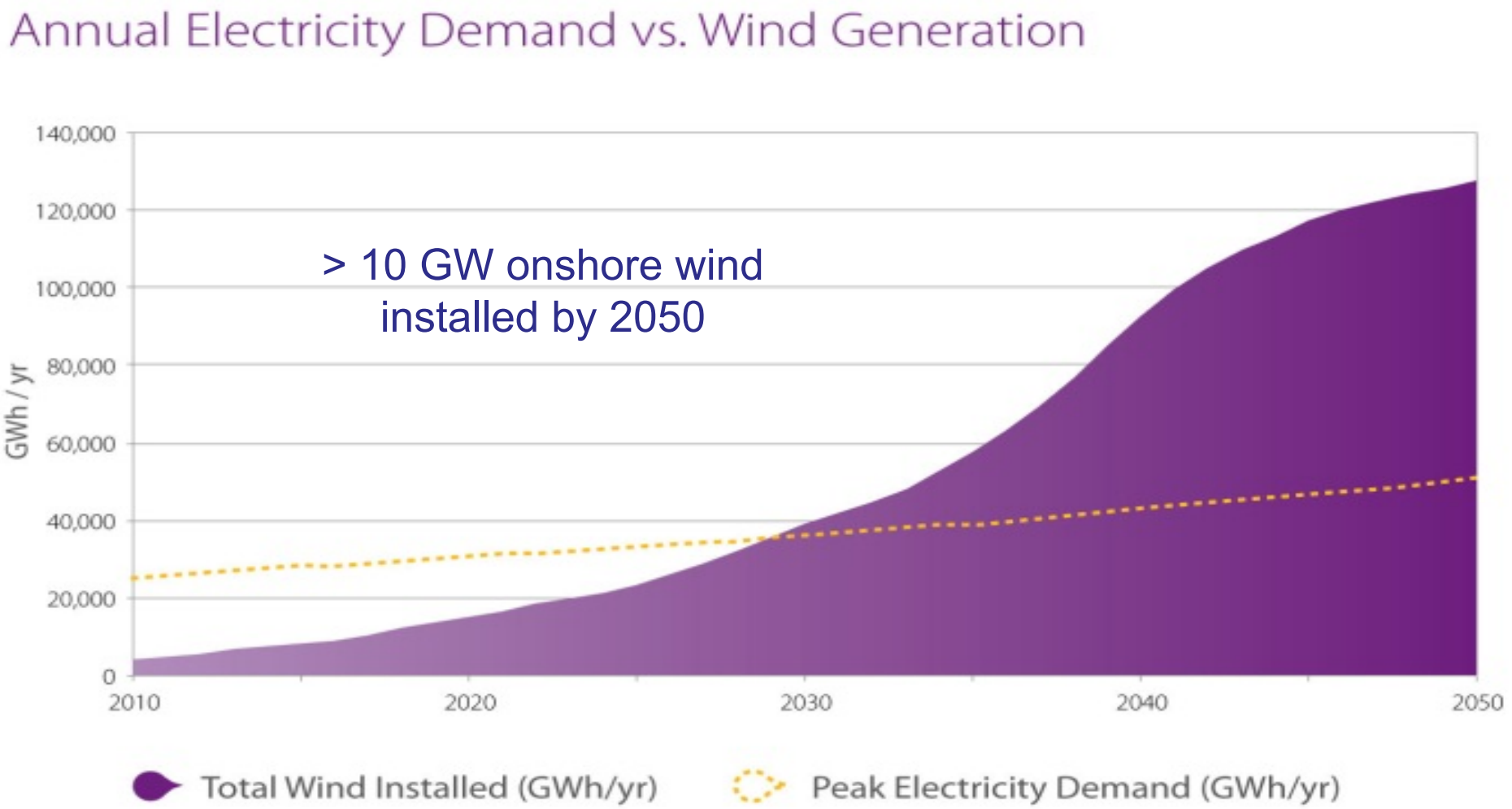
Wind – Generation Potential



Source: SEAI Wind Energy Roadmap 2050

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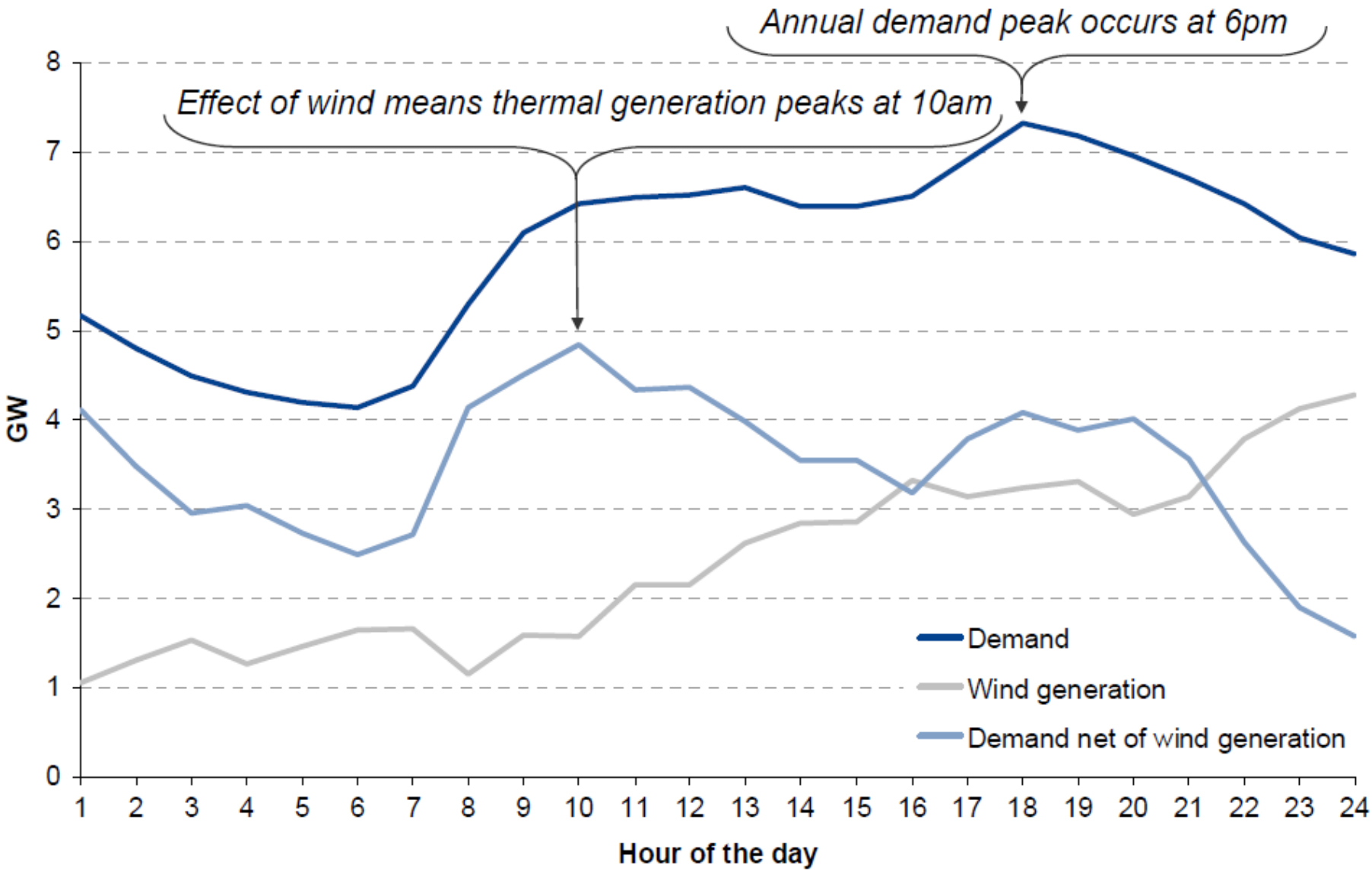
A problem with wind

Monthly average within-day profile of SEM demand and wind generation in November 2020 (assuming 6.1 GW of installed wind capacity)



Source: Pöyry Energy Consulting / CER: Demand Side Vision for 2020 consultation paper.

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Benefits of Smart Meters

National Smart Meter Plan

Balancing variable supply with demand Without breaking the system

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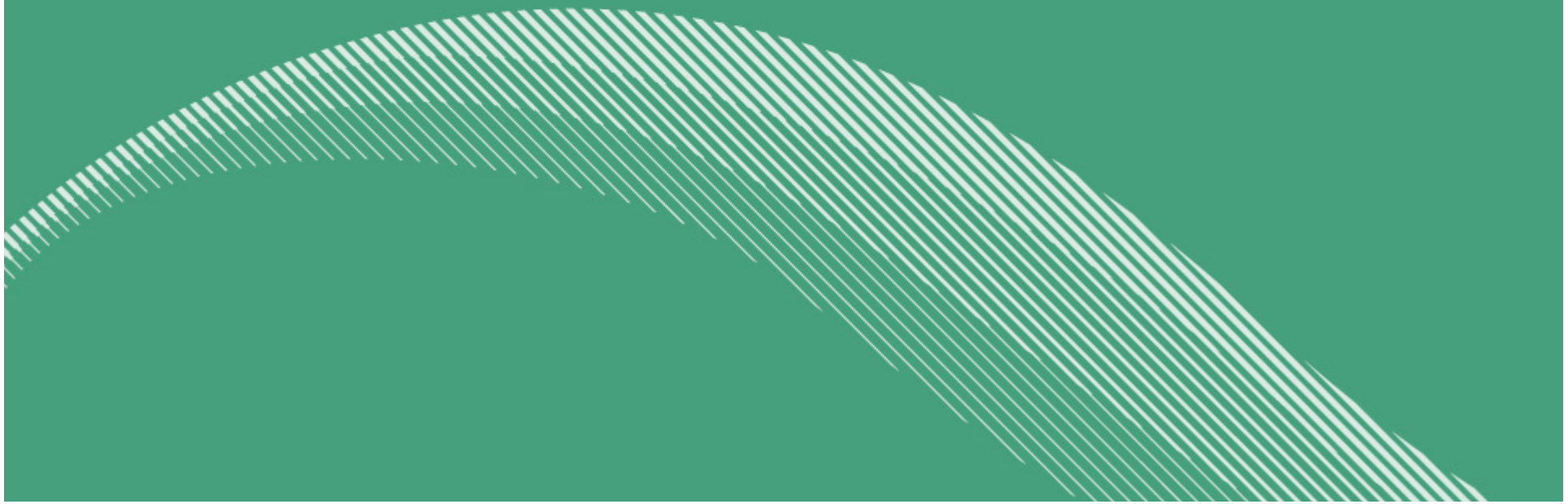
Next Steps



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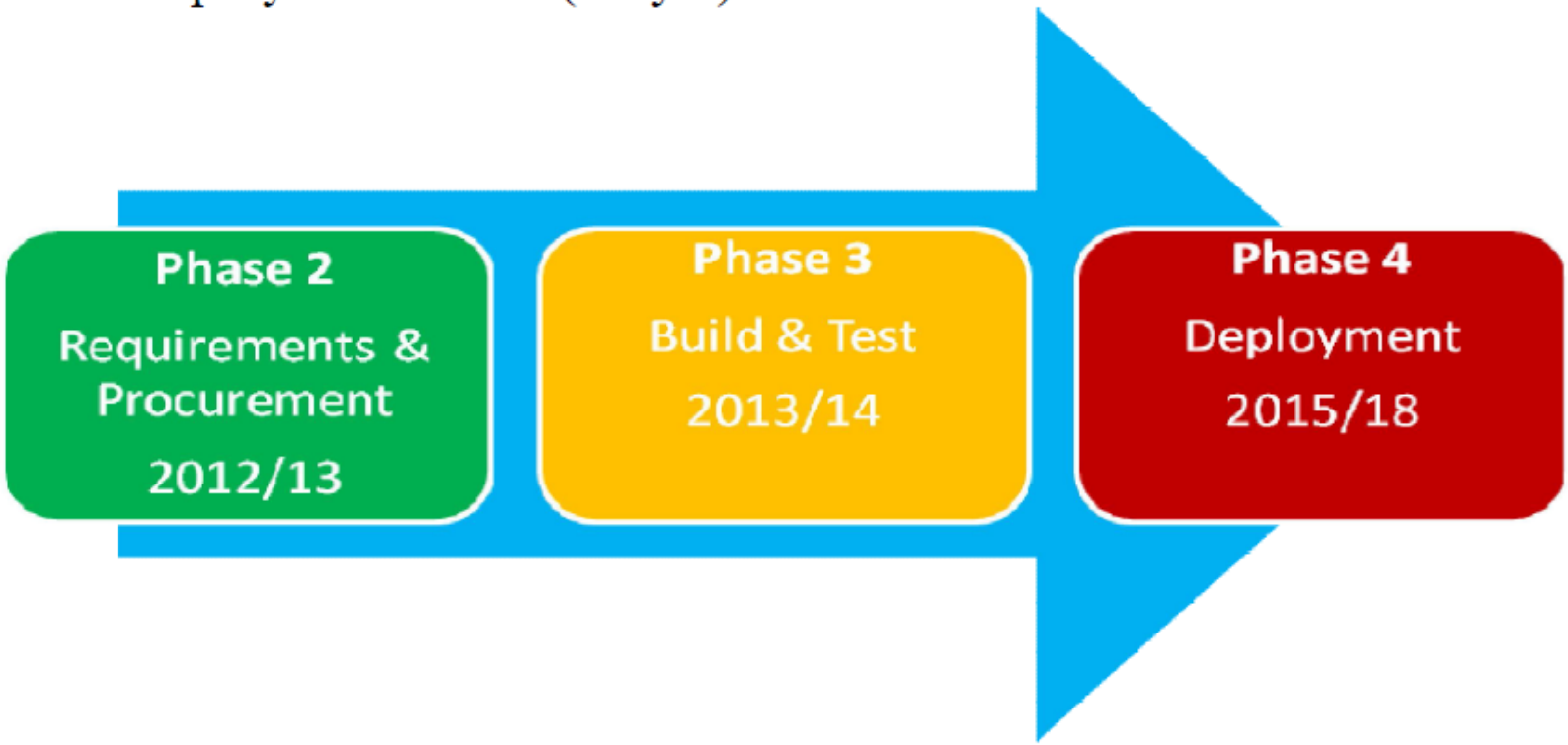
High Level Implementation Timelines

- **Phase 1**: Discovery, Exploration and Business Case Development (Q1 2012)
- **Phase 2**: Planning, Requirement Definition, Procurement and Selection (≤2yrs)
- **Phase 3**: Detailed design, System testing and Pre-Deployment roll out (≤2yrs)
- **Phase 4**: Deployment Phase (2-4yrs)



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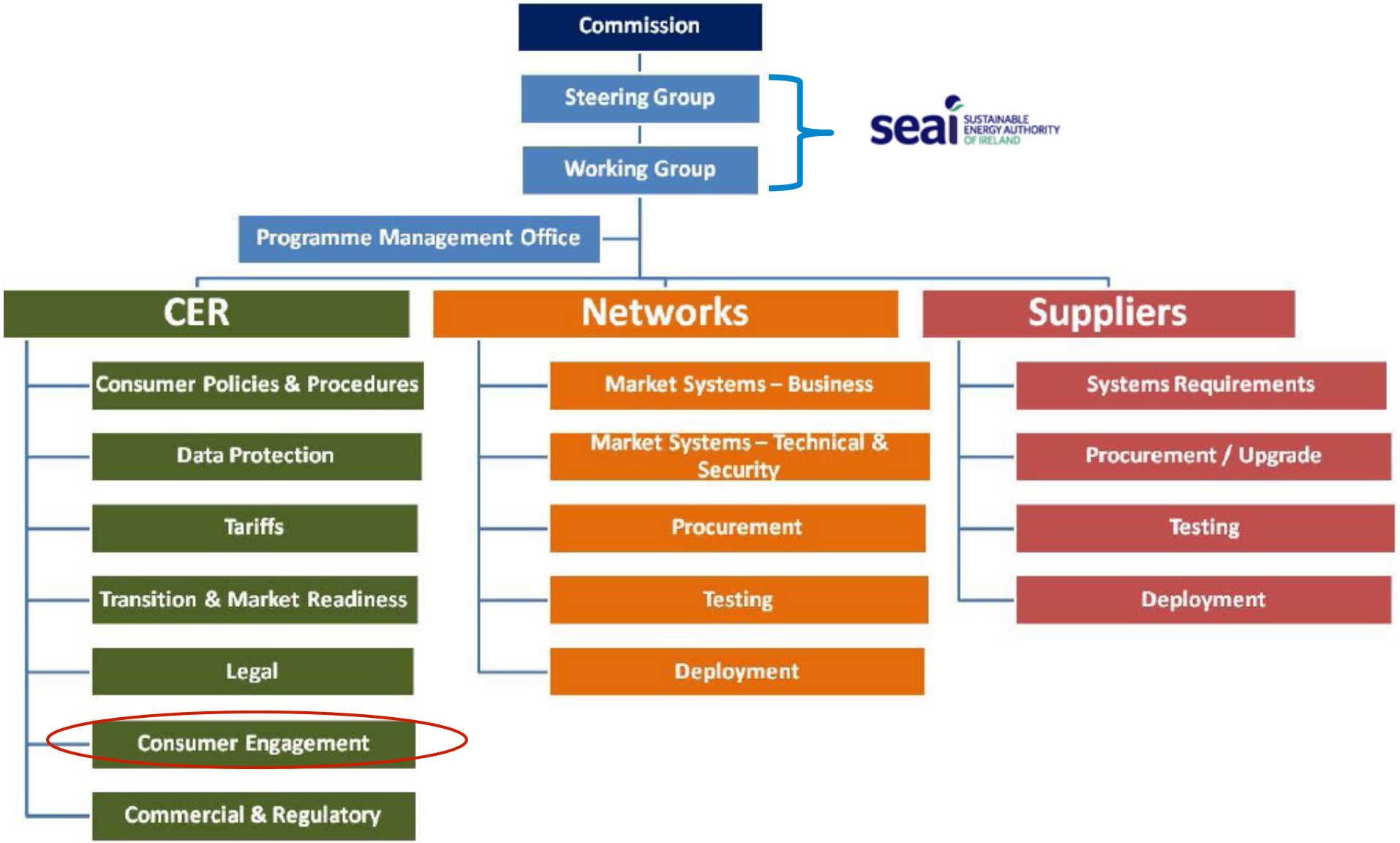
Governance



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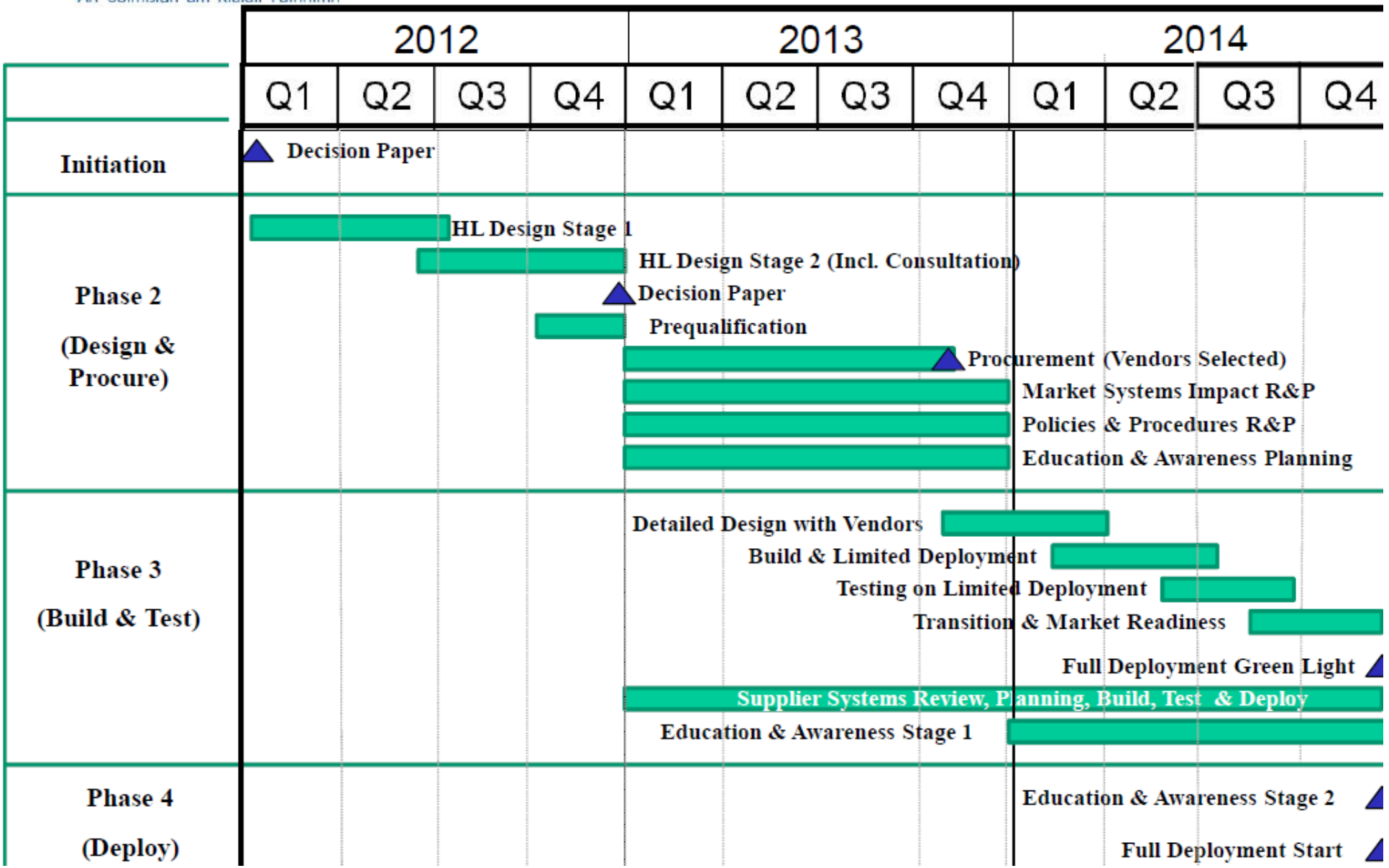
High Level Timelines



Some figures:

- 2 million meters
- Half hourly consumption reads
- 35 Billion reads per year (35,040,000,000)
- Potential ???

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EUROPEAN REGIONAL DEVELOPMENT FUND

Ireland's EU Structural Funds Programmes 2007 - 2013

Co-funded by the Irish Government and the European Union

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