

Developing Ireland's Building Renovation Strategy

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Introductory information

- Ministry (DCENR) taking the lead
- Relying on Agency (SEAI) for technical and discussion inputs
- SEAI engaged expert consultants
- Process began in May 2013 (procurement), work started September 2013

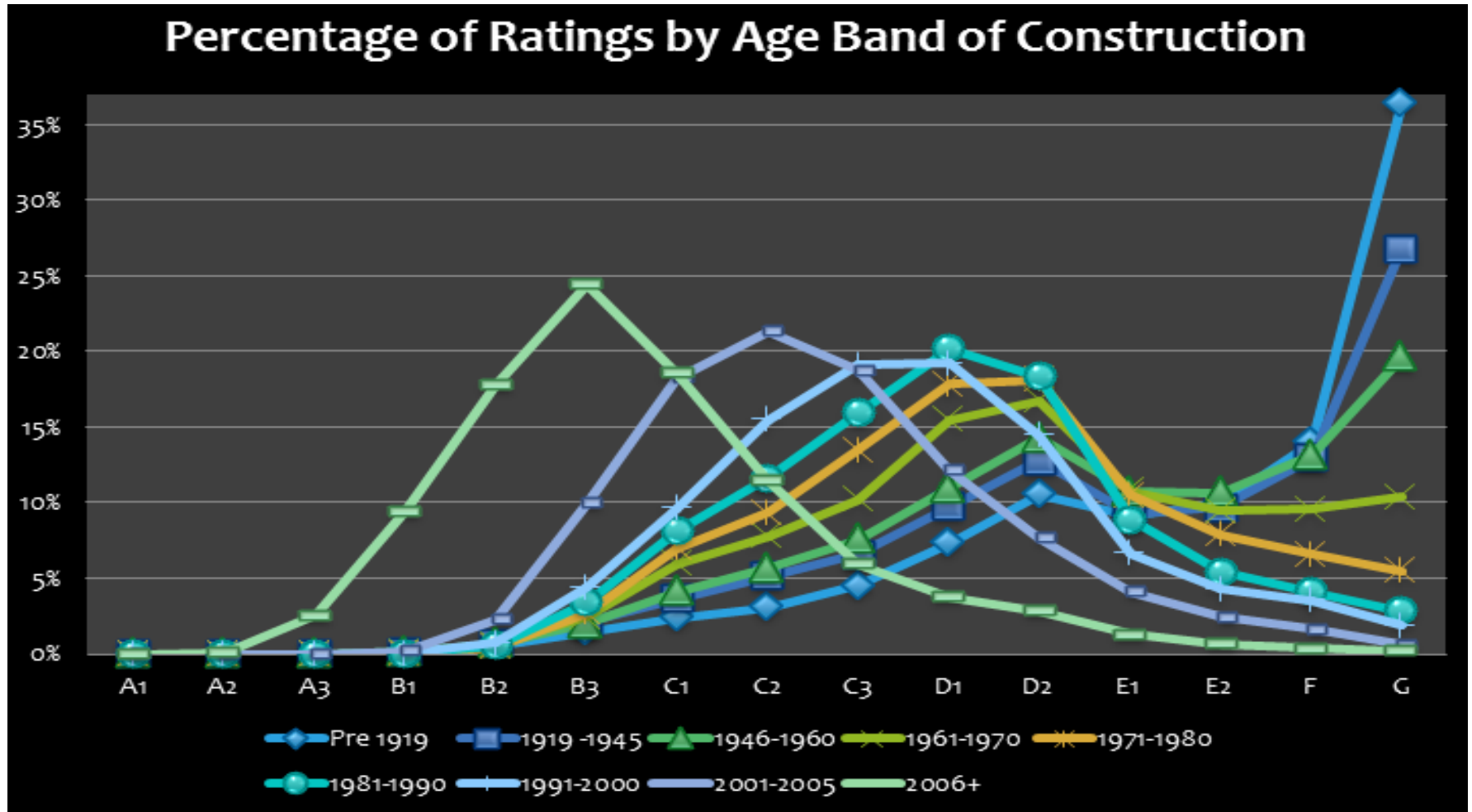
Stock overview

- Good data and previous modelling for the residential sector – 1.7 million permanently occupied dwellings
 - Over 400k BER's (circa 24% of housing stock)
- New survey for commercial buildings – supplemented with ND-BER (17,000) and scaled on geo-directory (whole stock register)
- Public sector data meter register under development (30,000 electricity meter points, 3,000 gas meter points)
- Number of previous studies on potential energy savings by sector (links provided at end).

Technical stuff ...



Detailed analysis (Residential BER data)



Source: Irene Morris-Codagan

[SEAI BER Research Tool](http://www.seai.ie/Your_Building/BER/National_BER_Research_Tool/)

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From assumptions to measured benefits

- Better Energy Homes Billing Analysis
- Billing data for 200 homes
- 22.4% gas demand reduction (4,065 kWh)
- Payback: 11 years (with grant), 15.5 years (total expenditure)

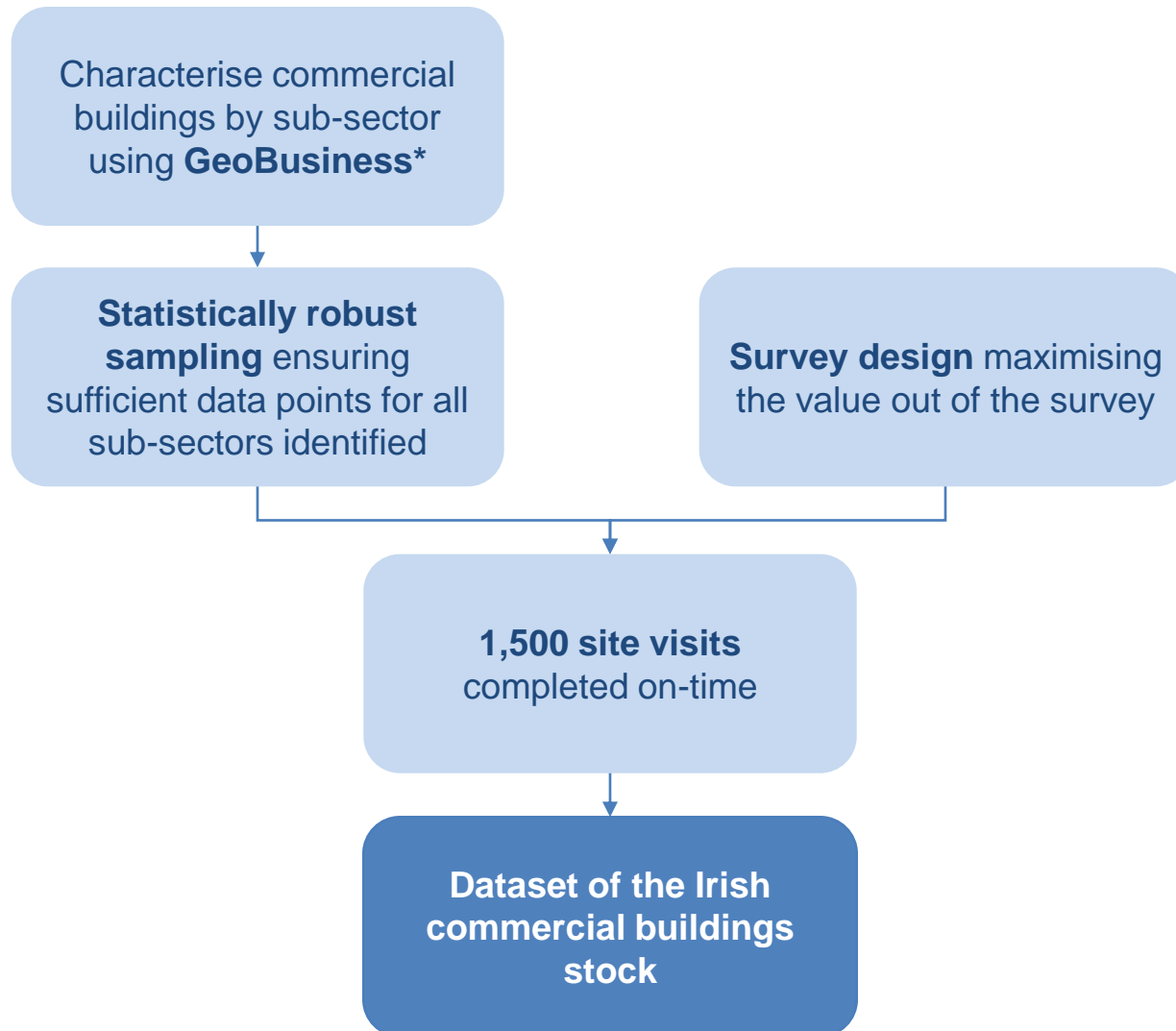


New commercial survey undertaken

- 1,500 site visits
- Survey designed to plug critical modelling gaps when existing ND-BER data considered
- Activity levels based on National Calculation Methodology database*
- 115 archetypes selected
- 17 technical and behavioral energy efficiency measures selected

* National Calculation Methodology (NCM) activity database is available at:
http://www.seai.ie/Your_Building/BER/Non_Domestic_buildings/Download_SBEM_Software/Download_SBEM_Software.html

Useful new information on the Irish commercial buildings stock is gathered through 1,500 site visits



*GeoBusiness, an electronic register of every business address in the State, provides a complete geographical database covering close to 200,000 businesses across the Republic of Ireland.

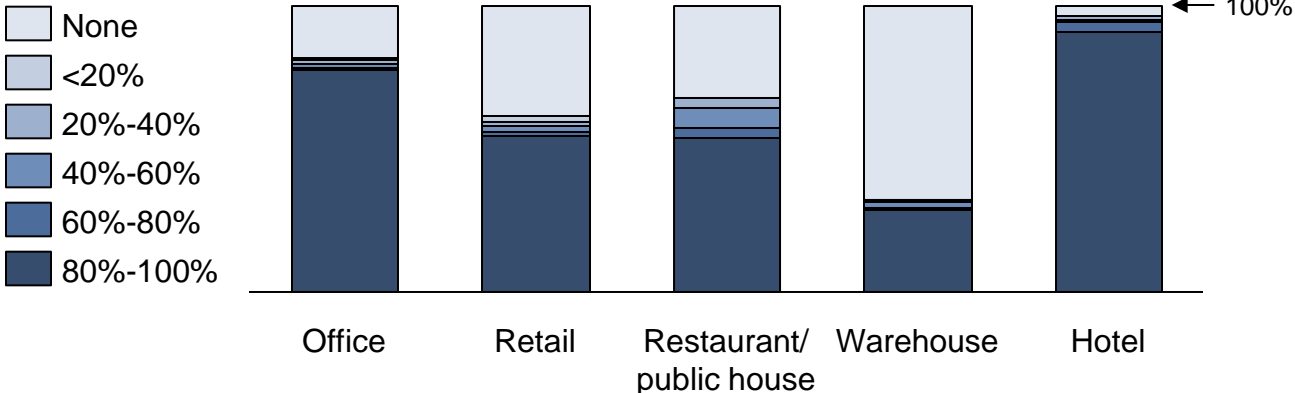
Irish commercial buildings stock has been developed using the survey results and the GeoDirectory database

Number of buildings in Irish commercial stock (Total = ~113,500)



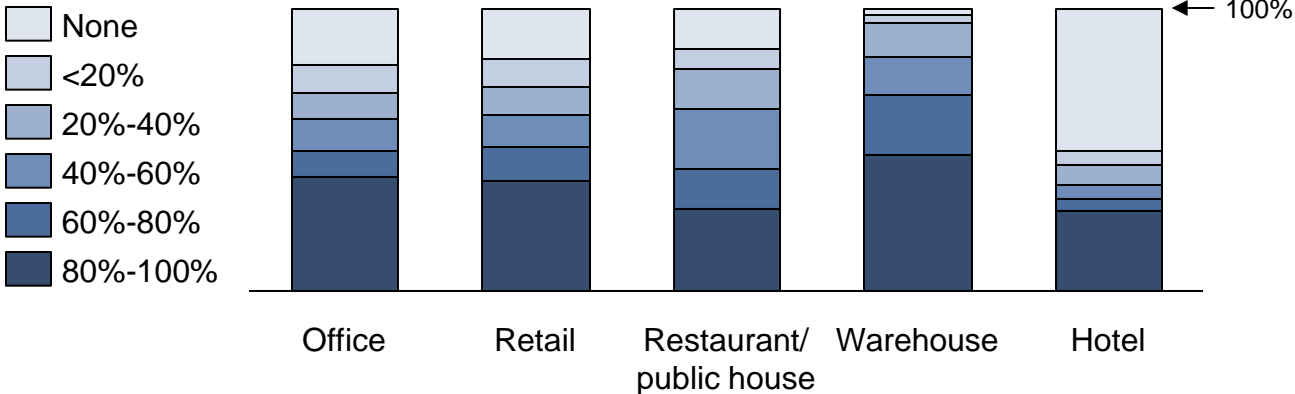
Survey designed to provide key input data to the building energy model for the calculation of technical energy savings potential

Example survey question #1: Fraction of double/triple glazing



“Estimate the fraction of windows which are double/triple glazed”

Example survey question #2: Fraction of low energy lighting



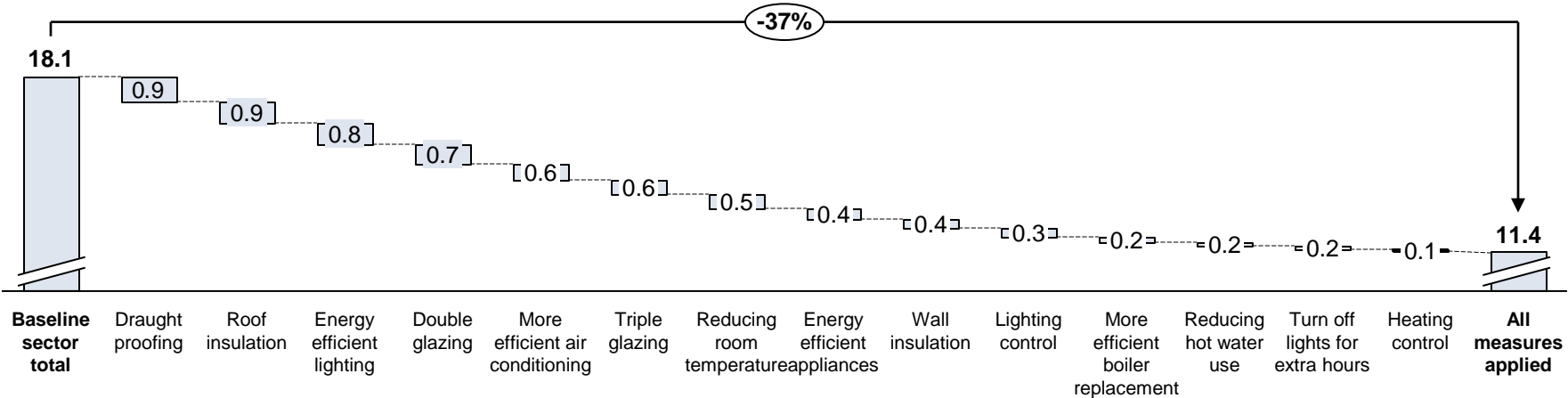
“Estimate the fraction of light bulbs which are ‘low energy’ light bulbs”

More than 30% primary energy savings can be achieved through a wide range of measures in the commercial sector

Technical savings potential by measure

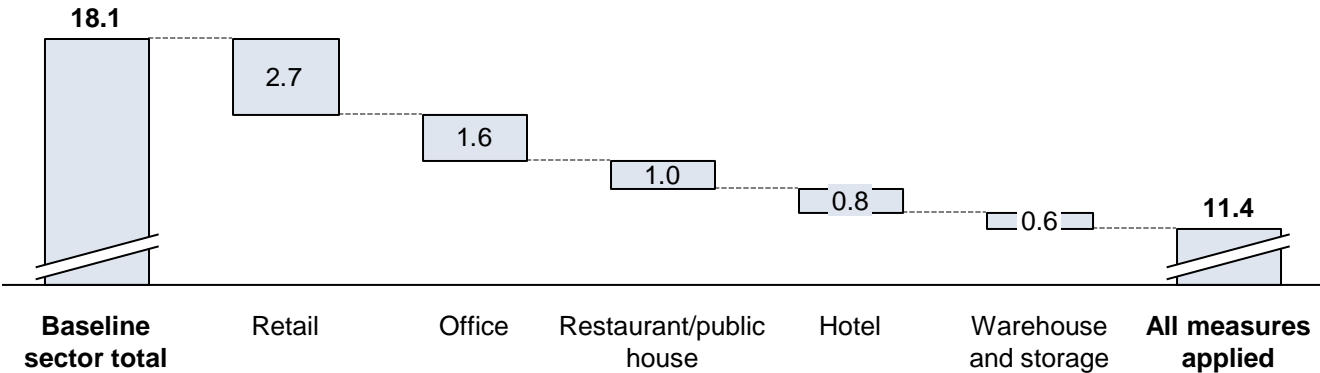
DRAFT RESULTS

Primary energy (TWh)



Technical savings potential by sector

Primary energy (TWh)



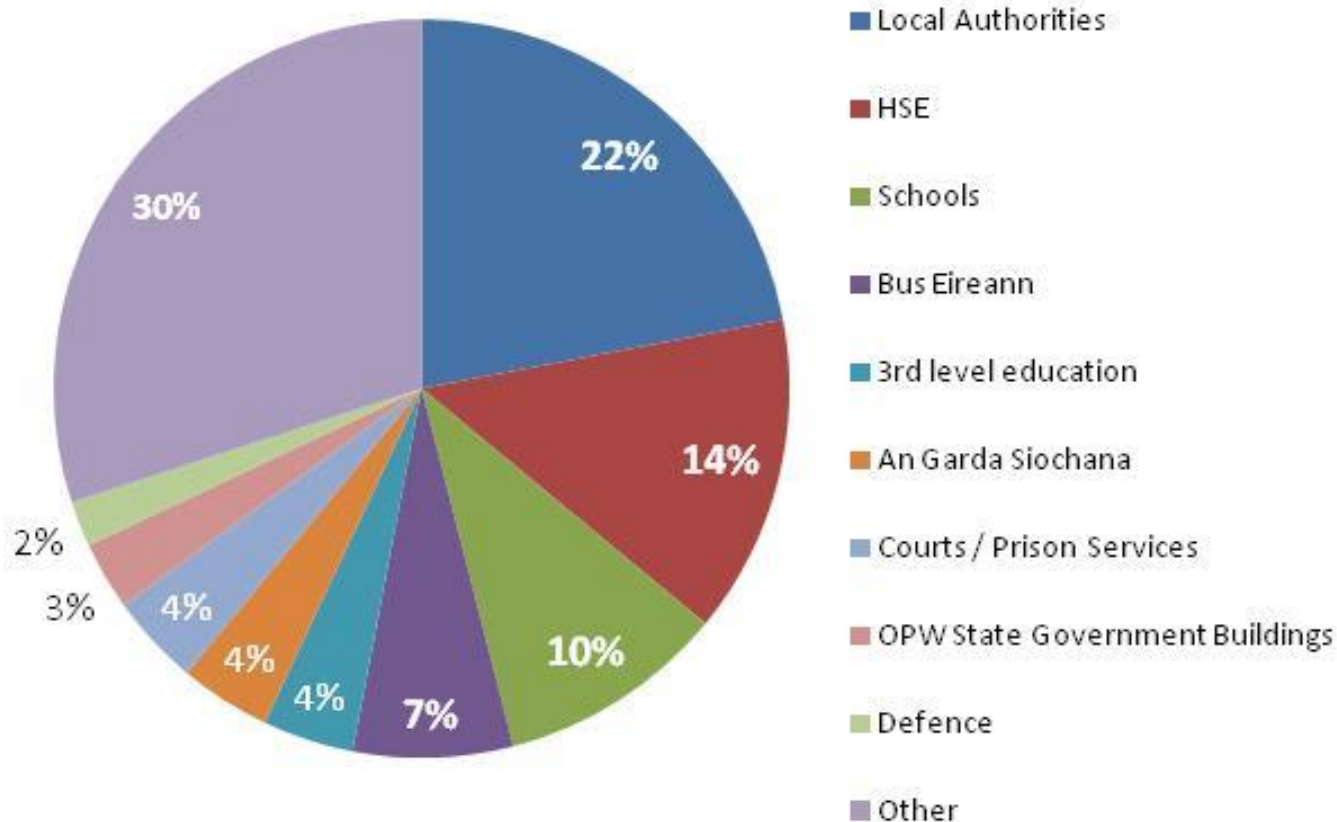
Incremental savings are shown in the graph above to avoid double-counting

In addition to the measures shown above, heat pumps also offer more than 0.8 TWh (~5%) of savings potential

Detailed results such as savings for each archetype are also available in the national stock model

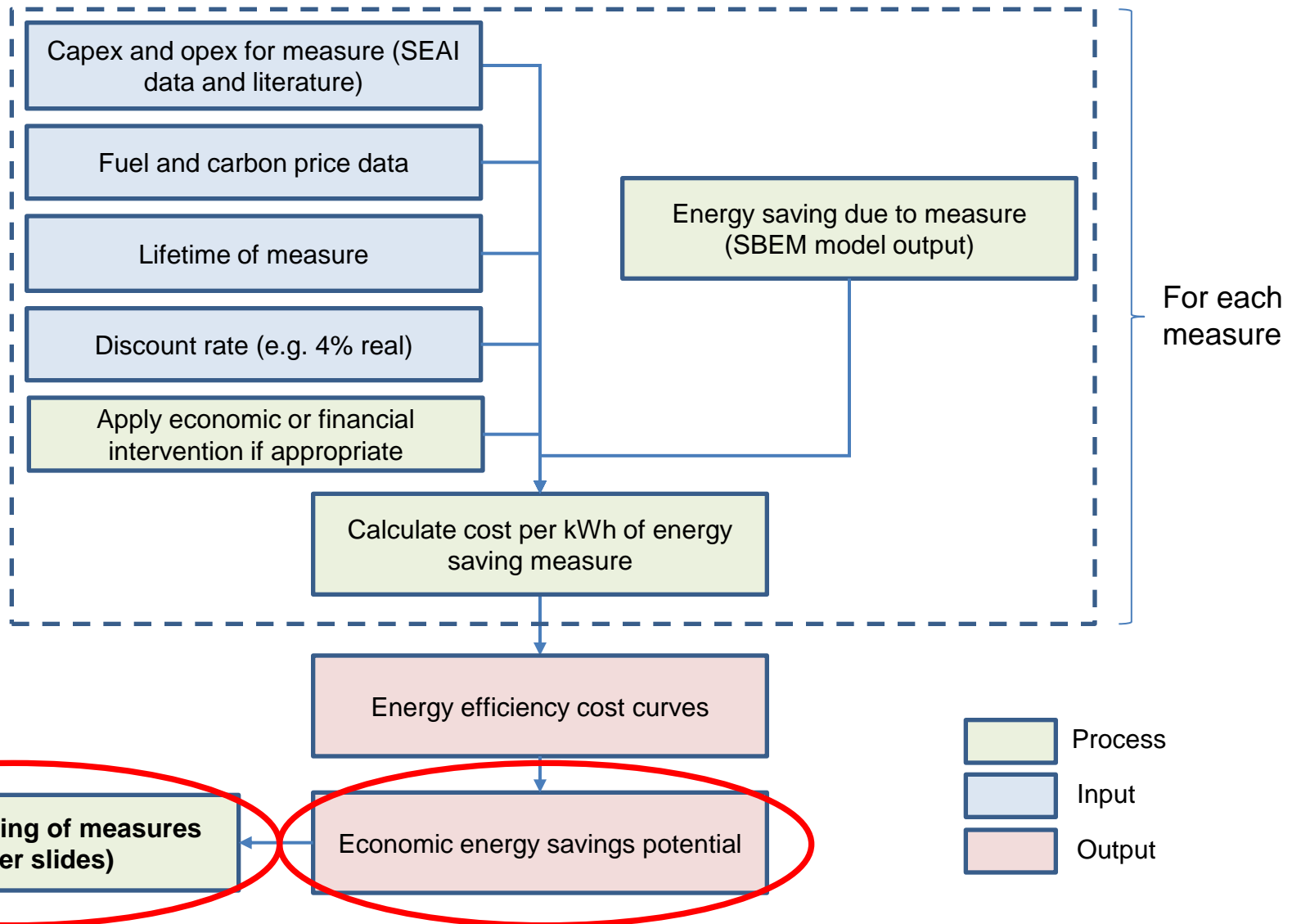
Public Sector Energy Spend

Approximately €600 - €700M per annum energy



30,000 electricity meter points, 3,000 gas points covering >90% of sectoral demand

Cost curves will be calculated including all energy saving measures, allowing the economic potential to be estimated



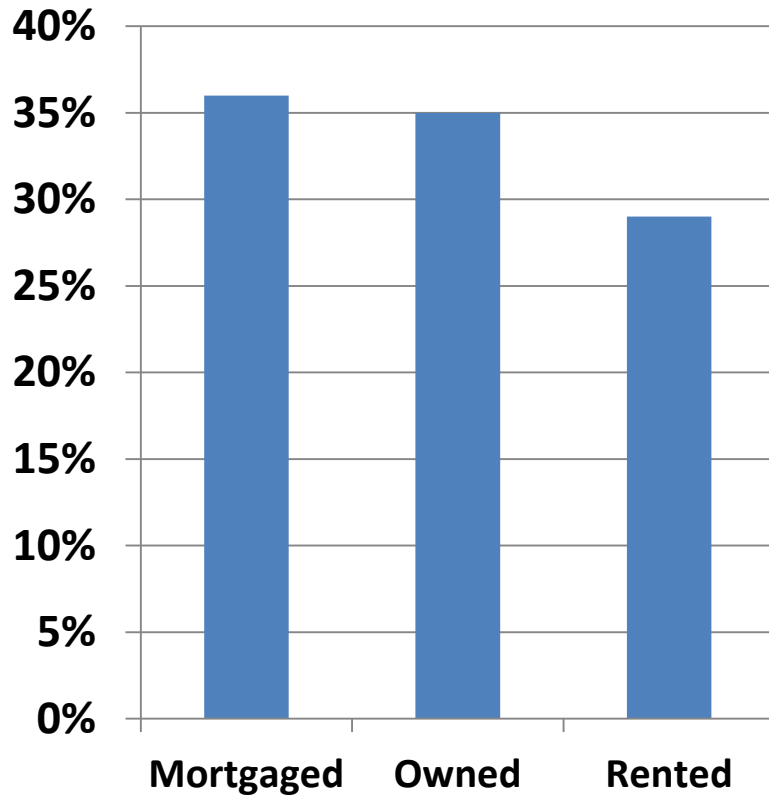
People stuff ...



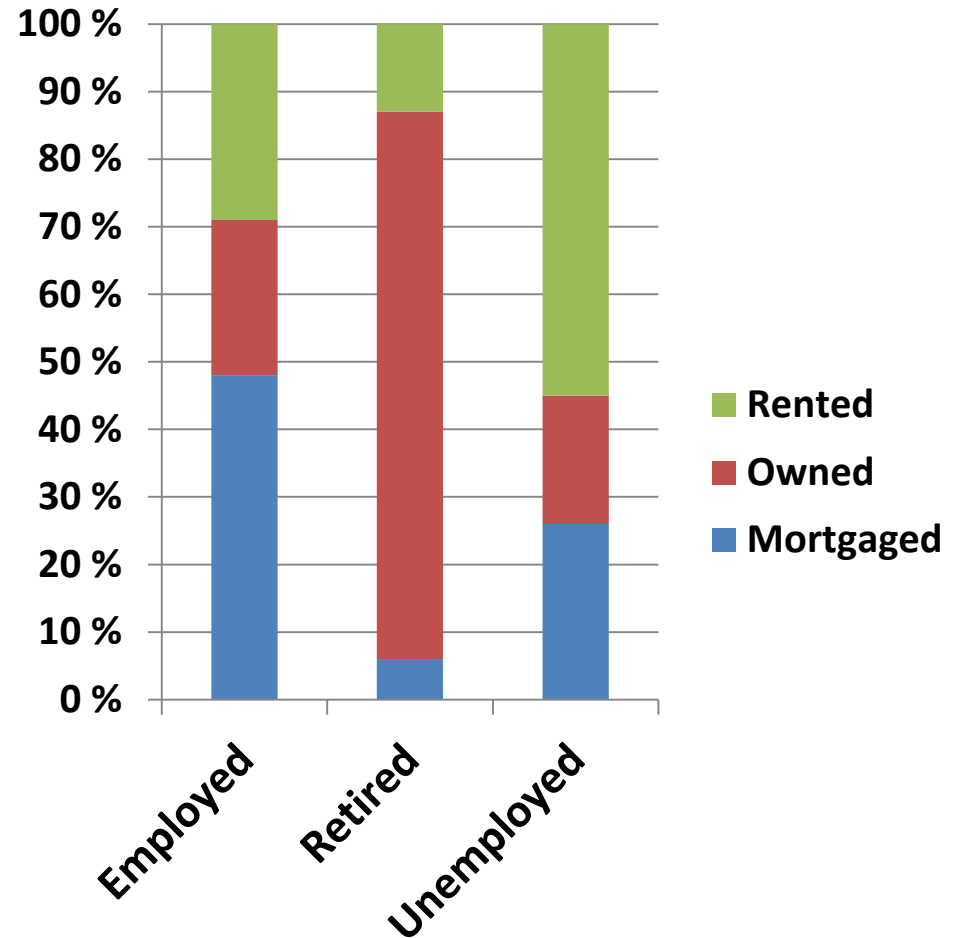
Market Potential by Tenure and Employment Status

(Census 2011)

Housing Stock by Tenure



Tenure by Employment Status



Disaggregating the potential (residential)

GWh savings potential by occupancy and employment status

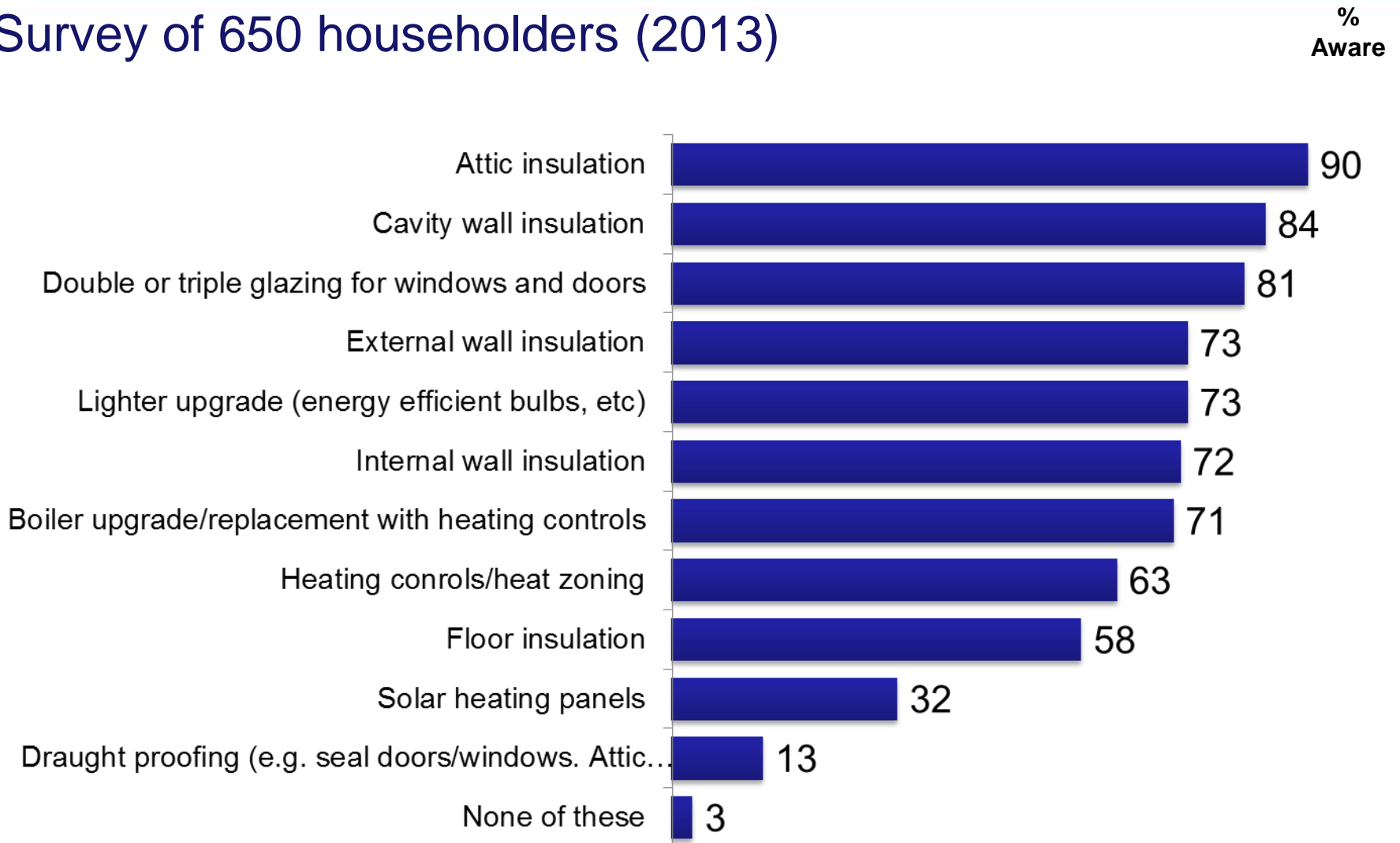
	Mortgage			Owned			Rented			Totals
	Employed	Unemployd	Retired	Employed	Unemployd	Retired	Employed	Unemployd	Retired	
Deep	4,250	466	181	2,036	331	2,390	2,615	982	381	13,630
Medium	3,108	340	132	1,489	242	1,748	1,912	718	279	9,968
Shallow	1,670	183	71	800	130	939	1,028	386	150	5,357

- *Number of homes*
- *Total costs per cohort*

Tailored policies and measures

Understanding consumers - Awareness

Survey of 650 householders (2013)



Base: All Householders - 654

Perceived barriers to retrofitting

Barriers vary according to the type of retrofit.

Attic

- Already insulated – and many forget it then.
- DIY rolls of insulation in Woodies / B&Q.
- Suppliers offering insulation, as are a plethora of handymen.
- Attic full of storage.

Windows

- Many already insulated (at least double glazing).
- Expensive.
- Financing and ability to repay.

Boiler

- Ignorance of savings.
- Communication emphasis to-date has been on servicing.
- Conditioned to use until breaks down.

Interior Walls

- Lack of knowledge of why to choose each one.
- Costly to repay
- Upheaval (need to move out?) – added expense.
- Hidden costs of redecorating / moving radiators, etc.
- Perception only need to insulate one room / north wall etc.
- Loss of space internally.

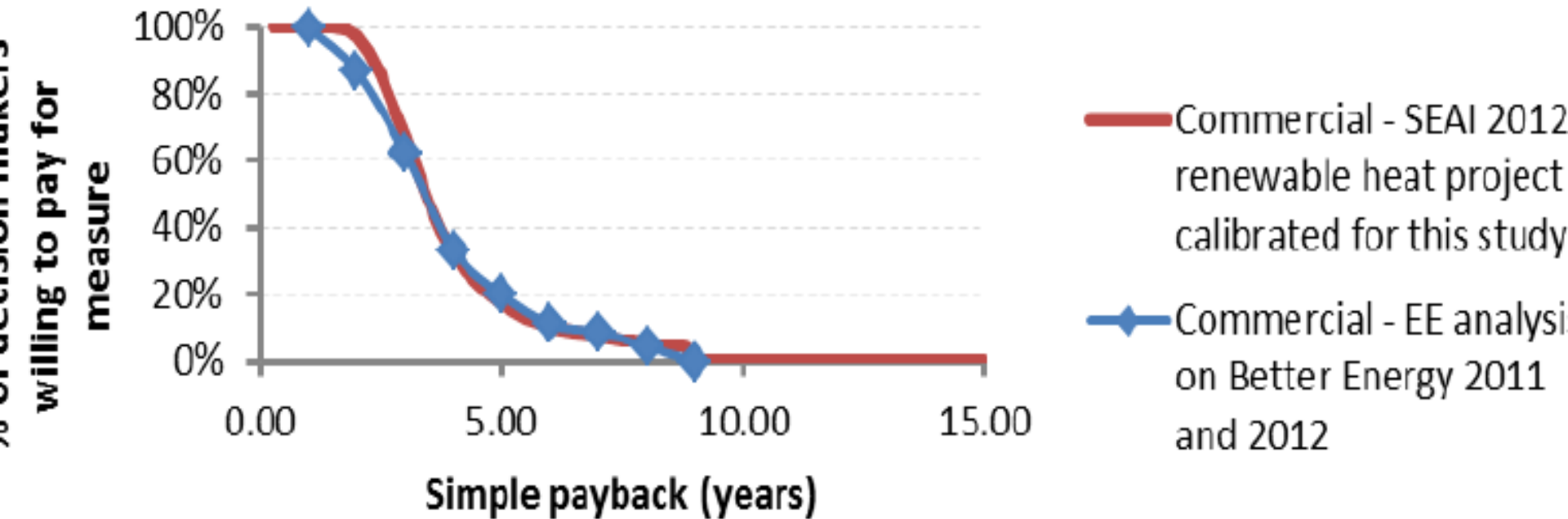
Exterior Walls

- Too costly to repay per month.
- Takes too long to repay
- Too long to register savings.
- Long-term fuel inflation not linked to savings by consumers.
- Fear factor of something new – does it work

Incorporating people 'stuff'

- Scenario development
 - e.g. assume high, medium and low levels of uptake
 - Subjective
- Choice modelling (logit)
 - includes the impact of various attributes on uptake
 - insights into how technologies compete for market share (preferences)
 - data on attitudes required (surveys)
- Willingness-to-pay (WPT)
 - Percentage of consumers willing to invest in a technology offering a given simple payback
 - e.g. Profit led companies - higher WTP given business motives
 - Hassle factors and other hidden costs can be incorporated

WTP (example)



Piecing it together...



Outputs of this study will inform Article 4 of Energy Efficiency Directive

EED Article 4

(a) an overview of the national building stock based, as appropriate, on statistical sampling

(b) identification of cost-effective approaches to renovations relevant to the building type and climatic zone

(c) policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations

(d) a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions

(e) an evidence-based estimate of expected energy savings and wider benefits

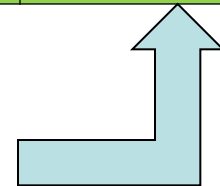
Outputs of this study to inform EED Article 4

- **WP1 – Commercial buildings:** survey with statistical representivity completed
- **Residential buildings:** Based on SEAI Residential Upgrade Model
- **Public buildings:** Estimated based on previous SEAI publications, ND-BER and DEC databases
- **WP2:** Technical energy savings potential for buildings completed
- **WP4:** Energy efficiency cost curves to be completed in March
- **WP5:** Efficacy of a variety of interventions such as grants and soft loans to stimulate cost-effective measures will be assessed using an uptake model
- Interim findings in April
- **WP5:** Uptake modelling will inform investment decisions of individuals and companies
- Construction industry and financial institutions will not be modelled explicitly.
- Interim findings in April
- **WP1-5** will inform evidence-based estimate of expected energy savings and wider benefits (i.e. CO₂ savings)
- Interim findings in April

Information gaps

	Technical	Economic	'People'	Policy	Wider benefits
Residential	BER, Tabula etc.	Programme data	Surveys done (WTP/Choice modelling)	Existing policy mix (+changes)	Health, affordability, etc.
Commercial	New survey	Programme data	Surveys planned (WTP/Choice modelling)	Existing policy mix (+changes)	Competitiveness Etc.
Public	PS Survey	Programme data	Surveys planned (WTP/Choice modelling)	PS Programme (+changes)	Reduced public spend

Coverage?



- Submit as much as possible by 30th April – *‘first version’*
- More detail by end July 2014
- Public/stakeholder consultation September 2014
- Workshop late September
- Final version to Commission October 2014

Selected references

Demand side Management In Ireland

http://www.seai.ie/Publications/Energy_Policy_Publications/Demand_Side_Management/KEMA_Full_Report.pdf

Low Carbon Opportunity (cost curves)

http://www.seai.ie/Publications/Low_Carbon_Opportunity_Study/Low_Carbon_Opportunity_Study.html

EU database provides harmonised energy savings potentials for each EU Member State

<http://www.eepotential.eu/esd.php>

Residential Energy Roadmap

http://www.seai.ie/Renewables/Residential_Energy_Roadmap.pdf

Better Energy Homes Billing Analysis

http://www.seai.ie/Publications/Energy_Modelling_Group/Energy_Modelling_Group_Publications/Better_Energy_Homes_Impact_Report_Billing_Analysis.pdf

Brining Energy Home (2010) Householder survey.

http://www.seai.ie/News_Events/Press_Releases/Bringing_Energy_Home_Report.pdf

Better Energy Workplaces – Impact report

http://www.seai.ie/Grants/Better_Energy_Workplaces/Better_Energy_Workplaces_2011_Impact_Report.pdf

BER research tool

http://www.seai.ie/Your_Building/BER/National_BER_Research_Tool/

Commercial buildings survey data and analysis to be released soon...

Thank you.

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Ireland's EU Structural Funds
Programmes 2007 - 2013

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