

# Unlocking the Energy Efficiency Opportunity

## SUMMARY FOR POLICYMAKERS

June 2015



OF SUPPLY • HOUSEHOLDER SAVINGS • EMISSIONS REDUCTION • ENERGY SAVING  
ELECTRICITY SAVINGS • FUEL SAVINGS • GOVERNMENT POLICY • EXCHEQUER SAVINGS  
INVESTMENT OPPORTUNITIES • ANALYSIS • ENERGY SAVING • EMPLOYMENT  
POTENTIAL • RETROFIT • MACROECONOMIC GAINS • SUPPLY CHAIN DEVELOPMENT  
CONSUMER CHOICES • POLICY • EFFICIENT ECONOMY • ANALYSIS • IMPLEMENTATION  
POLICIES • RETROFIT • SIGNIFICANT ENERGY SAVINGS POTENTIAL • BUSINESS  
COMPETITIVENESS • SECURITY OF SUPPLY • HOUSEHOLDER SAVINGS • EMISSIONS  
REDUCTION • TARGET ACHIEVEMENT • ELECTRICITY SAVINGS • FUEL SAVINGS  
GOVERNMENT POLICY • EXCHEQUER SAVINGS • INVESTMENT OPPORTUNITIES  
INVESTMENT • EMPLOYMENT POTENTIAL • RETROFIT • MACROECONOMIC GAINS  
SUPPLY CHAIN DEVELOPMENT • CONSUMER CHOICES • POLICIES • EFFICIENCY  
ANALYSIS • SUPPORT • CONSUMERS • POTENTIAL • SIGNIFICANT ENERGY SAVINGS  
POTENTIAL • BUSINESS COMPETITIVENESS • SECURITY OF SUPPLY • HOUSEHOLDER  
SAVINGS • EMISSIONS REDUCTION • TARGET ACHIEVEMENT • ELECTRICITY SAVINGS  
FUEL SAVINGS • GOVERNMENT POLICY • EXCHEQUER SAVINGS • INVESTMENT  
OPPORTUNITIES • ENERGY SAVINGS • EMPLOYMENT POTENTIAL • ANALYSIS  
MACROECONOMIC GAINS • SUPPLY CHAIN DEVELOPMENT • CONSUMER CHOICES

# HIGHLIGHTS

## THE INVESTMENT OPPORTUNITY

Investing in energy efficiency, sufficient to bridge the gap to the 2020 energy efficiency target, will bring savings of over €11 billion. These benefits flow from an investment of over €3 billion which delivers a Net Present Value (NPV) – that is, net savings – of €8 billion. This is before multiple benefits such as health, business productivity and security of energy supply benefits resulting from energy efficiency improvements are included.

**€11bn**

INVESTING IN ENERGY EFFICIENCY, SUFFICIENT TO BRIDGE THE GAP TO THE 2020 ENERGY EFFICIENCY TARGET, WILL BRING SAVINGS OF OVER €11 BILLION.

## EXCHEQUER PERSPECTIVE

The Government balance sheet is improved by around €1 billion on investing in these measures to meet the 2020 target. Government support for energy efficiency programmes could be self-financing, particularly when energy savings are realised in the public sector.

**€1bn**

THE GOVERNMENT BALANCE SHEET IS IMPROVED BY AROUND €1 BILLION ON INVESTING IN THESE MEASURES.

## MACRO-ECONOMIC IMPACTS

Achieving the savings required to reach the 2020 target will create around 2,000 additional jobs, increase industrial productivity and increase GDP by 0.3% (2020). Annual energy savings of €1.8 billion will accrue to households and businesses, and Ireland will be more resilient to price spikes of imported energy sources.

**2,000**

ACHIEVING THE SAVINGS REQUIRED TO REACH THE 2020 TARGET WILL CREATE AROUND 2,000 ADDITIONAL JOBS.

## SUPPLY CHAINS

The positive macroeconomic effects more than offset the reduced output in energy-supplying sectors. This is largely because most of Ireland's energy is imported and the domestic supply chains are short. This is in contrast to newly created supply chains; for example, in the construction and energy efficiency retrofit sector.

**Offset**

THE POSITIVE MACROECONOMIC EFFECTS MORE THAN OFFSET THE REDUCED OUTPUT IN ENERGY-SUPPLYING SECTORS.

IRELAND'S TARGET IS TO BE  
**20% MORE ENERGY EFFICIENT BY  
2020 (33% FOR THE PUBLIC SECTOR)**

# Action

MOST OF THE POLICY INTERVENTIONS IDENTIFIED IN THIS REPORT BUILD ON POLICIES AND MEASURES ALREADY UNDER INVESTIGATION OR IMPLEMENTATION.

# 38%

IRELAND HAS ACHIEVED AROUND 38% OF THE SAVINGS REQUIRED TO MEET THE 2020 TARGET.

# 2020

SIGNIFICANT PRIMARY ENERGY SAVINGS POTENTIAL REMAINS AFTER 2020.

## POLICY INTERVENTION

Most of the policy interventions identified in this report build on policies and measures already under investigation or implementation. This shows that the policy foundation is strong but needs to be further strengthened and enhanced if Ireland is to realise the significant savings potential identified in this report. Examples include implementing market-orientated mechanisms, extending regulation, and providing targeted information at the same time as adopting new technology.

## IRELAND HAS SIGNIFICANT ENERGY SAVINGS POTENTIAL ACROSS ALL SECTORS STUDIED

As of 2013, Ireland has achieved around 38% of the savings required to meet the 2020 target. The remaining 62% of savings must be met by increased effort in existing and new policy measures such as those identified in this report. Energy efficiency measures are identified in this report that could bridge the current gap to the 2020 energy efficiency target.

## REMAINING POTENTIAL BEYOND 2020

In commercial, public and residential buildings and industry sectors, significant primary energy savings potential remains after 2020. Achieving savings post-2020 will require greater policy interventions to deliver measures to less engaged consumers.



**Energy efficiency can save households money, make businesses more competitive, reduce Ireland's reliance on imported fossil fuels and greatly contribute to environmental objectives including reduction of greenhouse gas emissions. The International Energy Agency (IEA) recently highlighted a broader range of benefits including improved health (and reduced health budget spend), increased asset values, poverty alleviation and job creation.<sup>1</sup>**

The Sustainable Energy Authority of Ireland (SEAI) presents here robust evidence to inform Ireland's national strategy to unlock the energy efficiency potential and meet the country's energy efficiency targets, contributing:

- a detailed analysis of the potential for energy efficiency improvements – both technical and behavioural - across all major energy-consuming sectors in Ireland to 2020.
- an analysis of feasible policy interventions that would support the implementation of the identified measures.
- an assessment of the economy-wide implications for the Exchequer.
- a longer-term perspective to 2030 across the sectors studied.

The study goes beyond a straightforward estimate of the technical and economic savings potential of energy efficiency measures and incorporates the behaviour and decision-making process of consumers. The extent to which energy users will actually implement energy efficiency measures is considered in the context of a range of targeted policy options designed to influence uptake. In addition, scenarios are developed to present options for achieving the savings required to meet Ireland's 2020 energy efficiency target.

A full report providing more specific detail for all sectors analysed, and a technical assumptions document accompany this summary.

## IRELAND HAS SIGNIFICANT ENERGY SAVINGS POTENTIAL

This report identifies potential energy efficiency savings that amount to nearly a quarter of Ireland's primary energy demand in 2013 (nearly 35 TWh). These savings are over and above what is required to bridge the current gap to the 2020 energy efficiency target.

The identified measures are both technical and behavioural. Almost 75% of these measures are cost-effective whereby they reduce energy use and bring net financial savings in the long-term. Yet despite being cost-effective much of the available energy saving potential remains untapped due to reasons such as market failure and barriers<sup>2</sup>. Unlocking the savings requires a continuation and extension of existing policies and measures, as outlined in Ireland's National Energy Efficiency Action Plan (NEEAP), as well as implementation of new measures, some of which are identified in this report.

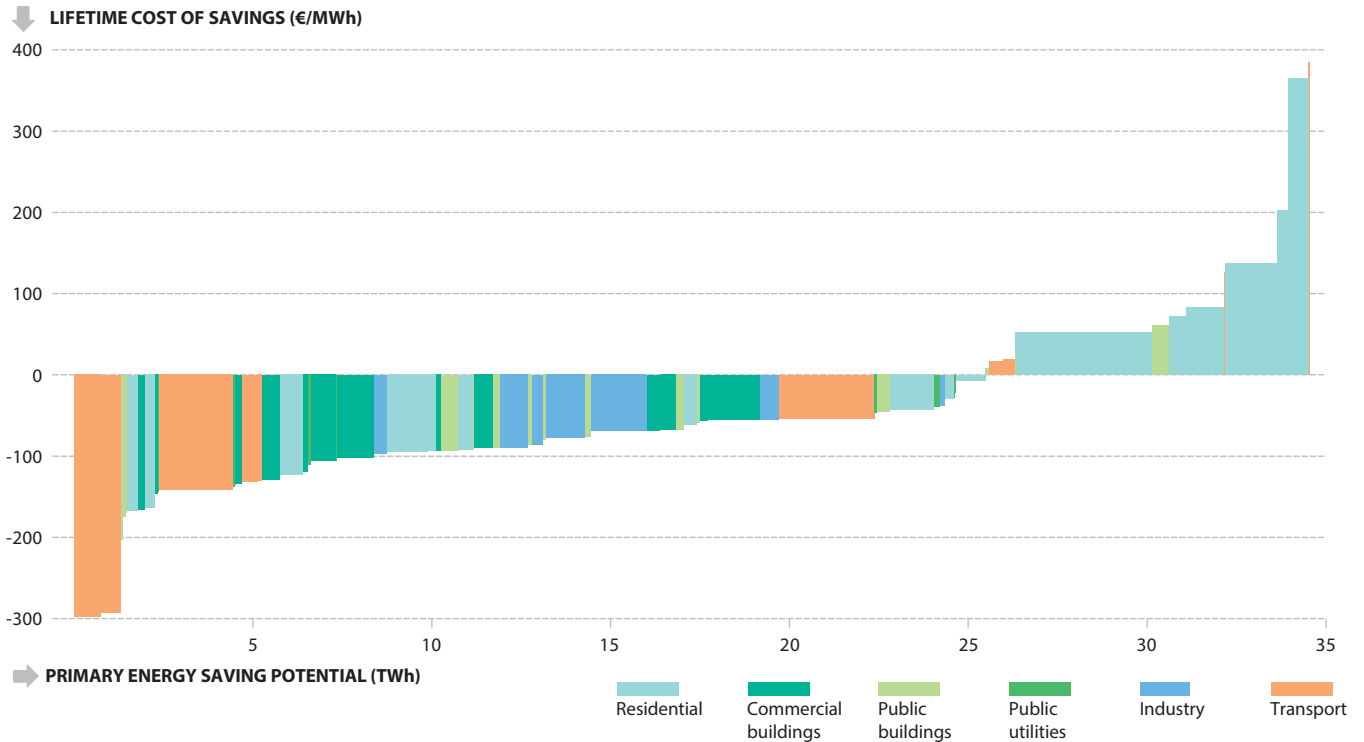
Figure 1 shows the energy efficiency cost curve across all demand-side sectors in Ireland<sup>3</sup>. In absolute terms, the potential is largest in the residential buildings sector (13.5 TWh), followed by the transport (7.3 TWh), commercial buildings (6.0 TWh) and industry (4.8 TWh) sectors.

1 'Capturing the Multiple Benefits of Energy Efficiency', IEA 2014.

2 These include lack of access to capital, split or misplaced incentives, lack of sufficient information (knowledge), unpriced externalities (such as greenhouse gas emissions) etc.

3 The horizontal axis of the energy efficiency cost curve shows the technically feasible primary energy savings potential in 2020 of a wide range of energy saving measures. The vertical axis shows the lifetime cost of savings for each individual measure, based on discounting the associated costs and benefits (at a 10% discount rate) over the lifetime of the measure.

FIGURE 1: IRELAND ENERGY EFFICIENCY COST CURVE IN 2020 (PRIVATE PERSPECTIVE)



Those measures that are deemed uneconomic (i.e. above the horizontal axis in the Figure 1), can be delivered with well-targeted support and/or financial incentives. For example, bundling the implementation of uneconomic measures together with economic measures could make the overall investment economically viable. Details of the measures included in Figure 1 are included in the full report at [www.seai.ie/energydata](http://www.seai.ie/energydata).

## THE 2020 TARGET COULD BE ACHIEVED THROUGH EXISTING AND NEW POLICY MEASURES

As of 2013, Ireland has achieved around 38% (12 TWh) of the savings required to meet the 2020 energy efficiency target based on the latest National Energy Efficiency Action Plan (NEEAP III). The remaining 62% (or 20 TWh of additional savings) must be achieved through an increased level of effort delivered through existing and new policy measures. As mentioned above, this study identifies nearly 35 TWh of potential energy savings which is over and above what is required to bridge the current gap to the 2020 target.

Table 1 presents a selection of the key technology opportunities for energy savings in each sector. New policy interventions which could help to achieve the savings are subsequently listed (see Key policy interventions).

THIS REPORT IDENTIFIES POTENTIAL ENERGY EFFICIENCY SAVINGS THAT AMOUNT TO **NEARLY A QUARTER OF IRELAND'S PRIMARY ENERGY DEMAND IN 2013 (NEARLY 35 TWh).**



TABLE 1: KEY ENERGY SAVINGS OPPORTUNITIES FOR ALL SECTORS

SECTOR	KEY OPPORTUNITIES	PRIMARY ENERGY SAVINGS POTENTIAL IN 2020 (TWh)
<b>COMMERCIAL BUILDINGS</b>	• Energy efficient lighting with controls	1.1
	• Heat pumps	0.8
	• Roof insulation	0.7
	• Energy efficient glazing	0.7
<b>PUBLIC BUILDINGS, TRANSPORT AND UTILITIES</b>	• Energy efficient lighting with lighting controls	0.5
	• Energy efficient glazing	0.5
	• More efficient boiler with heating controls	0.4
	• Roof insulation	0.2
	• LED street lighting	0.2
<b>RESIDENTIAL</b>	• Efficient boiler with heating controls	3.8
	• Solid wall insulation	1.5
	• Roof insulation	1.2
	• Energy efficient appliances – “Cold” and “Electrical cooking”	0.7
	• Reducing room temperature by 1°C (behavioural)	1.1
<b>INDUSTRY</b>	• Process integration and heat recovery for low temperature processes	1.6
	• More efficient motor systems	1.1
	• Combined Heat and Power	0.8
<b>ROAD TRANSPORT (EXCL. PUBLIC TRANSPORT)</b>	• Private cars – EU regulation	2.7
	• Private cars – VRT re-balancing	0.8
	• Eco-driving	0.8
	• Modal shift	1.5

THE KEY POLICY RECOMMENDATIONS COVER A RANGE OF INTERVENTION TYPES WHICH ARE SPECIFICALLY AIMED AT OVERCOMING BARRIERS, SUCH AS MARKET FAILURE, TO UNLOCK THE POTENTIAL OF COST-EFFECTIVE ENERGY EFFICIENCY POLICIES AND MEASURES.



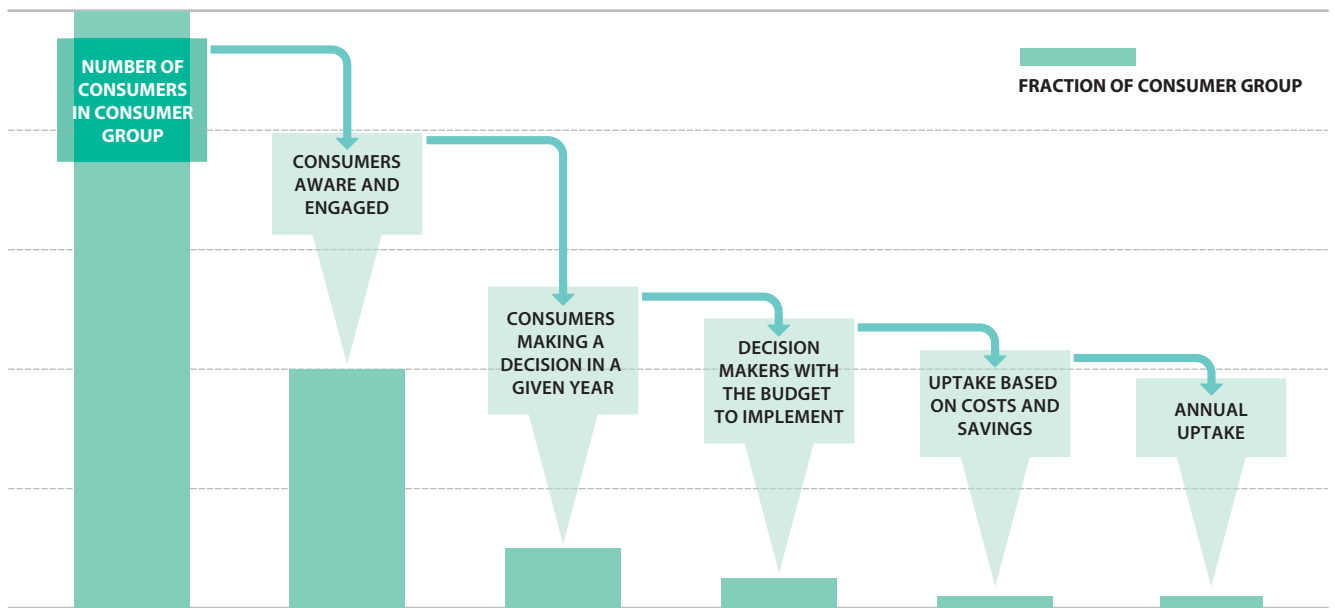
## DRIVING ENERGY EFFICIENCY UPTAKE WITH TARGETED POLICIES AND MEASURES

The key policy recommendations cover a range of intervention types which are specifically aimed at overcoming barriers, such as market failure, to unlock the potential of cost-effective energy efficiency policies and measures.

In particular, this study proposes policy actions that are targeted at specific parts of the consumer decision-making process. This approach recognises that consumers respond differently to interventions depending on, for example, their knowledge, level of engagement and financial constraints. Targeting interventions at specific customer types and at particular stages of the decision-making process will increase the uptake of the relevant measure.

The key stages in the decision making process, illustrated in Figure 2, highlight that of the total number of consumers in each consumer group, only a fraction are currently aware and engaged with the benefits of energy efficiency. A subset of this group will make a decision to invest in a given year, of which a smaller number will have the available funds. Finally, various economic criteria specific to each consumer type are considered before a decision is made to invest in energy efficiency improvements.

FIGURE 2: CONSUMER DECISION MAKING PROCESS



This consumer-focussed approach highlights the requirement for interactive policy designed to induce uptake. The key policy interventions should be considered as a whole package of measures, complementary and necessary to drive uptake.

Most of these policy interventions build on existing policies and measures. This shows that the policy foundation is strong; but needs to be further strengthened and enhanced if Ireland is to realise the significant savings potential identified in this report.

## KEY POLICY INTERVENTIONS



### 1. OFFERING LOW INTEREST FINANCE FOR RESIDENTIAL RETROFIT

The Government's Better Energy Financing project<sup>4</sup> is aimed at developing a market-oriented approach to transition from Exchequer-funded grants for energy efficiency measures to a market-based approach to realising energy efficiencies. The findings in this study provide strong support for such mechanisms to specifically address the barrier of upfront investment costs for consumers. A recent survey showed that almost half of Irish consumers would consider taking out a loan to pay for energy efficiency improvements<sup>5</sup> and therefore unlocking this potential could deliver significant further savings.

Potential mechanisms include:

- Pay-As-You-Save (PAYS) type scheme with a low interest rate (<5%) which is currently under consideration in the context of the Government's Better Energy Financing project. It is estimated that savings of 0.4 TWh could be achieved by 2020 by reducing the interest rate of a PAYS scheme from 8% to 5% with the impact increasing for interest rates below 5%.
- Employer-based schemes providing employees with low interest loans (such as through salary-sacrifice mechanisms) which are currently being trialled by SEAI.
- Assisting home energy suppliers to partner with third-party lenders to provide homeowners with low interest loans.



### 2. UNLOCKING POTENTIAL ENERGY SAVINGS IN THE RESIDENTIAL AND COMMERCIAL SECTORS THROUGH DIRECT FINANCIAL SUPPORT

The analysis underpinning this study suggests that meeting the 2020 energy efficiency target will require both market-based measures and direct financial support to overcome the barrier of upfront cost to the consumer, recognising that different consumer groups respond to different policy supports.

Direct financial support in the residential and commercial sectors can be provided through the Exchequer and/or energy suppliers (as part of the Energy Efficiency Obligation Scheme). Continuation of direct financing through the Government's existing Better Energy programmes (for example) could deliver up to 0.6 TWh in the commercial buildings sector and a further 1.3 TWh in the residential sector over the period to 2020, depending on the level of funding provided and depth of retrofit required.



### 3. REACHING 'UNAWARE' OR 'DISENGAGED' CONSUMERS THROUGH REGULATION

A survey of commercial organisations and private landlords, undertaken as part of this study, found that more than one-third do not consider energy reduction to be a top priority.

While building regulations mandate the minimum efficiency of boilers and lighting in domestic buildings in Ireland, there is currently no corresponding regulation in the non-domestic sector. One way of targeting 'unaware' and 'disengaged' consumers is through regulation. With appropriate controls, such regulations force even the most reluctant decision makers to act on energy efficiency. Opportunities include:

- Minimum boiler and lighting efficiency standards in the non-domestic sector
- Minimum thermal efficiency standards in the private rented property sector
- Consequential improvement regulations for all domestic and non-domestic buildings.

Together these measures could lead to additional energy savings of 1.8 TWh across the commercial, industry and public sectors.

In the transport sector, linking Vehicle Registration Tax (VRT) and motor tax to CO<sub>2</sub> emissions of passenger cars has proved successful in changing consumer behaviour. Extending this fiscal incentive to light-duty vehicles offers further savings potential in the hard-to-treat transport sector.

4 [http://www.seai.ie/Better\\_Energy\\_Financing/Home/](http://www.seai.ie/Better_Energy_Financing/Home/)

5 Behaviour & Attitudes survey for SEAI (2014)





#### 4. **MAXIMISING THE IMPACT OF ENERGY AUDITS FOR BUSINESS**

Energy audits are mandatory for all large companies from 2015 in response to the requirements of the Energy Efficiency Directive 2012. This will compel all large companies to assess the potential for energy saving measures in their buildings and to consider implementing these measures<sup>6</sup>.

However, despite this mandatory requirement, this study found that around 60% of businesses think they have already put in place all possible measures or don't consider energy saving to be a top priority. The obligation for an energy audit could be leveraged as a tool to embed structured energy management for these businesses and thereby ensure the maximum benefit is derived from these audits. Savings could be improved if the requirement for audits is extended to all industrial sites.

It is estimated that such action could lead to combined energy savings of 1.3 TWh across the commercial, industry and public sectors.



#### 5. **ACTIVELY PROMOTING ENERGY SERVICES COMPANIES (ESCOs)**

Development of ESCO-type services is a key component of the Programme for Government. Targeted promotion of the services, such as facilitation of financing and investment in energy efficient technologies, provided by ESCOs to specific consumer groups could drive uptake.

Survey information, carried out as part of this study, found that active promotion of ESCOs to consumers (who think they have already put in place all possible energy efficiency measures as well as those who state that they need more information) could unlock energy savings. Such promotion will specifically need to act on a key finding in this report which showed widespread negative perception of Energy Performance Contracts (EPC) with more than one-third of companies reporting that they would not consider making use of the mechanism.

Specific examples of how this could be done include:

- Ensuring that the requirements of Article 18 of the Energy Efficiency Directive to develop a register of energy service providers is extended. Establishing a directory of ESCOs will make services more accessible to the market
- Linking potential projects to funding facilities, such as the Government's €70 million Energy Efficiency Fund established to finance energy efficiency projects across the Irish public and private sectors.
- Assisting communities or groups of organisations to come together to 'pool' or aggregate their energy efficiency opportunity; an action necessary to engage with ESCOs who typically have high minimum investment thresholds. One existing example is already occurring via SEAI's Sustainable Energy Communities initiative.

These types of actions, targeted at the relevant consumer groups, could lead to a further 1.0 TWh of primary energy savings across the commercial, public and industry sectors by 2020.

## KEY POLICY INTERVENTIONS (CONTINUED)



## 6. INCENTIVISING SAVINGS IN THE RESIDENTIAL SECTOR THROUGH SUPPLIER OBLIGATIONS

The Energy Efficiency Obligation Scheme (EEOS) is currently implemented pursuant to the Energy Efficiency Directive 2012. The Directive imposes a legal obligation on Member States to achieve new savings each year between 2014-2020 of the order of 1.5% of annual energy sales of all energy distributors and all retail energy sales companies.

The EEOS currently requires energy suppliers to achieve 25% of their target in the residential sector. Our analysis indicates that increasing the share of the target to greater than 25% in the residential sector would help to unlock even more savings from this sector. This increase of the target would recognise that energy suppliers have a significant role to play in the provision of direct financial support and energy efficiency advice in a sector that experiences significant barriers to act such as lack of access to capital and knowledge. Given additional costs to the supplier associated with delivery of EEOS targets may be passed onto the consumers, such a measure could be considered in the context of direct financial support in the sector.

In addition, providing tailored energy efficiency advice to consumers has been shown to be effective in enhancing the rate of uptake of energy efficiency improvements. This could be delivered through the existing energy supplier / consumer relationship via the EEOS. Informative billing, ideally including benchmarking of energy use with peer groups, should also be required.



## 7. ACHIEVING BEHAVIOURAL CHANGE THROUGH TARGETED INFORMATION CAMPAIGNS

Changing consumer behaviour in relation to energy use provides very significant potential to achieve energy savings. This study identified over 6.5 TWh of economic potential which includes areas such as reducing use of lights, reducing room temperatures and enabling low-power modes on equipment. However, key to realising this potential is the provision of targeted information and/or training at the same time as the adoption of new technology. This information and training acts as a stimulus for achieving long-term behavioural change and maximises the effectiveness of energy efficiency improvement measures.

Providing targeted information at the time of a retrofit (for example, during the uptake of EPCs by commercial and public organisations or of PAYS schemes in the residential sector) could lead to an additional 1.2 TWh of primary energy savings. Such an action is compatible with current delivery mechanisms e.g. information could be provided on project completion for works delivered via Better Energy Schemes and/or made mandatory for works completed via EPCs. Recommendations for appropriate training of staff could be included in the package of support measures on energy contracting already provided to businesses.



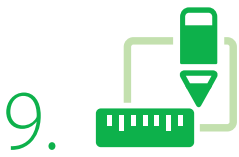
## 8. FOCUSING ON BEHAVIOURAL CHANGE IN TRANSPORT INCLUDING MODAL SHIFT AND ECO-DRIVING

SEAI has initiated a number of eco-driving programmes by forming partnerships with organisations including Dublin Bus, Bus Éireann and Collins Travel<sup>7</sup>. These schemes demonstrate the significant savings available through eco-driving practices. The findings from this study support the programme outcomes, and provide strong evidence that eco-driving holds significant potential to reduce energy use in the transport sector. A wide-reaching and prominent national eco-driving programme targeting new and existing drivers across all sectors could deliver energy savings.

In addition, large savings potential (1.5 TWh) is available through modal shift which is one of the Government's stated goals in the 2009 Smarter Travel policy document<sup>8</sup>. Further research should consider the use of possible financial incentives and pricing mechanisms to support modal shift.

7 Available at: [http://www.seai.ie/Your\\_Business/Public\\_Sector/Collins\\_Travel\\_ECODriving\\_Case\\_Study.html](http://www.seai.ie/Your_Business/Public_Sector/Collins_Travel_ECODriving_Case_Study.html)  
[http://www.seai.ie/Your\\_Business/Public\\_Sector/ECODriving\\_at\\_Bus\\_Eireann.html](http://www.seai.ie/Your_Business/Public_Sector/ECODriving_at_Bus_Eireann.html)

8 Smarter Travel: A Sustainable Transport Future, Department of Transport, 2009.



## 9. INCENTIVISING PACKAGES OF MEASURES TO ENCOURAGE DEEPER RETROFIT

The implementation of packages of several energy efficiency measures together is a way of increasing the number of measures that can be achieved cost-effectively i.e. by combining cost-effective with non-cost-effective measures. Where direct financial support is provided, through for example the Exchequer and/or energy suppliers, strongly incentivising (and potentially, where appropriate, enforcing) the implementation of packages of energy efficiency measures will lead to deeper retrofits. This will ensure more energy savings are achieved.

A RECENT SURVEY SHOWED THAT ALMOST HALF OF IRISH CONSUMERS WOULD CONSIDER TAKING OUT A LOAN TO PAY FOR ENERGY EFFICIENCY IMPROVEMENTS<sup>5</sup> AND THEREFORE UNLOCKING THIS POTENTIAL COULD DELIVER SIGNIFICANT FURTHER SAVINGS.

CONTINUATION OF DIRECT FINANCING THROUGH THE GOVERNMENT'S EXISTING BETTER ENERGY PROGRAMMES **COULD DELIVER UP TO 0.6 TWh IN THE COMMERCIAL BUILDINGS SECTOR AND A FURTHER 1.3 TWh IN THE RESIDENTIAL SECTOR OVER THE PERIOD TO 2020.**

FACILITATION OF FINANCING AND INVESTMENT IN ENERGY EFFICIENT TECHNOLOGIES, **PROVIDED BY ESCOS TO SPECIFIC CONSUMER GROUPS COULD DRIVE UPTAKE.**



## ENERGY EFFICIENCY INVESTMENT PATHWAYS

Three economy-wide scenarios have been developed, as shown in Table 2, to model a range of policy interventions (including those described above) applied at different levels of effort in different sectors. In all scenarios and all sectors, existing policy interventions are included and additional policy interventions

where they are deemed to be relatively straightforward to implement and likely to be successful (in particular, those with a low cost to the Exchequer). In each scenario, certain sectors are 'pushed', through the implementation of further policy interventions deemed to be more difficult to implement or less likely to be successful, typically involving a greater cost to the Exchequer or additional regulation.

TABLE 2: PRIMARY ENERGY SAVINGS IN THE THREE SCENARIOS MEETING THE 2020 TARGET

SECTOR	PRIMARY ENERGY SAVINGS (TWh, 2013-2020)		
	SCENARIO 1 – PUSH COMMERCIAL AND RESIDENTIAL	SCENARIO 2 – PUSH RESIDENTIAL AND INDUSTRY	SCENARIO 3 – PUSH INDUSTRY AND COMMERCIAL
TRANSPORT	4.2	4.2	4.2
PUBLIC	2.3	2.3	2.3
INDUSTRY	2.3	2.8	2.8
COMMERCIAL	2.6	2.2	2.6
RESIDENTIAL	3.7	3.7	3.2
<b>TOTAL</b>	<b>15.1</b>	<b>15.3</b>	<b>15.1</b>
Power sector and new buildings 2013-2020 (existing policy) <sup>9</sup>	5	5	5
Savings achieved to end-2012	12	12	12
<b>Primary energy savings 2007-2020</b>	<b>32</b>	<b>32</b>	<b>32</b>

<sup>9</sup> Ongoing improvements to the efficiency of electricity generation, transmission and distribution will lead to a reduction in primary energy consumption per unit of electricity produced. Improvement to building regulations for new dwellings will also make a contribution (totalling 5 TWh by 2020).

## ALL THREE SCENARIOS HAVE WIDER ECONOMIC BENEFITS

In each case, the investments carry a positive net present value (NPV)<sup>10</sup>; that is, they bring net savings over their lifetime. Economic output, measured as GDP, is higher in all three energy efficiency scenarios compared to the baseline by around 0.3% by 2020 and by 0.2% by 2030. In addition, there is a net increase in the level of employment of around

2,000 jobs by 2030<sup>11</sup>. Each of the three energy efficiency scenarios meets the 2020 target at a total undiscounted investment cost of between €4.2 billion and €4.6 billion.

Furthermore, there are a number of significant ancillary benefits related to energy efficiency which include improved health, well-being and improved competitiveness for business. These non-energy benefits are likely to have an economic impact beyond the value assessed here.

TABLE 3: SUMMARY OF KEY RESULTS FOR EACH SCENARIO

SECTOR	SCENARIO 1 – PUSH COMMERCIAL AND RESIDENTIAL	SCENARIO 2 – PUSH RESIDENTIAL AND INDUSTRY	SCENARIO 3 – PUSH INDUSTRY AND COMMERCIAL
<b>Total investments in energy efficiency</b> (discounted, 10%, € <sub>2013bn</sub> , 2013-2020)	3.3	3.2	3.1
<b>Total lifetime savings</b> (discounted, 10%, € <sub>2013bn</sub> )	11.3	11.3	11.2
<b>NPV of investments</b> (discounted, 10%, € <sub>2013bn</sub> )	8.0	8.0	8.2
<b>Total cost to the Exchequer</b> (discounted, 5%, € <sub>2013bn</sub> )	-1.0	-1.1	-1.2
<b>GDP impact in 2030</b> (% difference from base)	0.2%	0.2%	0.2%
<b>Employment</b> (‘000)	2.0	1.9	1.9

EACH OF THE THREE ENERGY EFFICIENCY SCENARIOS MEETS THE 2020 TARGET AND DELIVERS NET SAVINGS OF €8BN.



10 NPV calculated using a 10% discount rate.

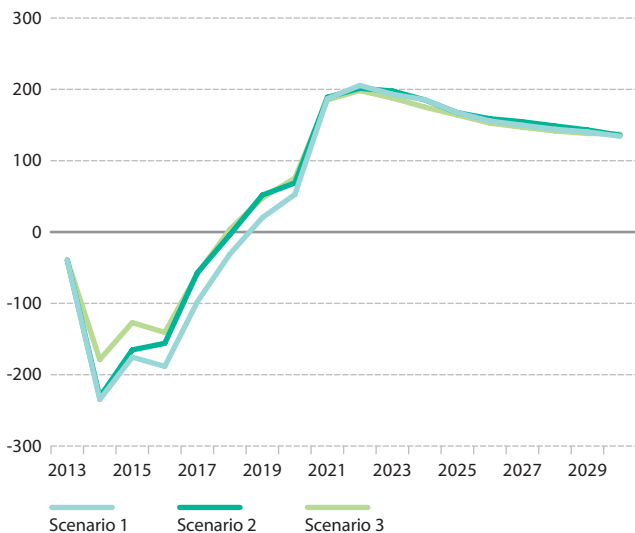
11 The circa 2,000 net new jobs are additional to any new jobs already created by savings achieved to date, and do not include those associated with policy measures already in place.

## GOVERNMENT BALANCE SHEET IS IMPROVED BY AROUND €1 BILLION

In the long term, the government balance sheet is improved through the implementation of the measures outlined in this report. Government support for the energy efficiency programmes could be self-financing, particularly if energy savings are realised in the public sector, reducing ongoing energy bills currently paid by the Exchequer. Over the period 2015 to 2030, the discounted balance sheet is improved by between €970 million and €1.21 billion depending on the scenario. These savings could be transferred back to households, further improving the macroeconomic benefits outlined above.

From the perspective of net cost to the Exchequer, it is more cost-effective to achieve higher energy savings in the commercial and public sectors compared to the residential sector, where consumer decision-making leads to low uptake even with substantial support. This finding has relevance for the sectoral allocation of savings in the next NEEAP.

**FIGURE 3: NET IMPACT ON GOVERNMENT BALANCES (DISCOUNTED €2013M)**



## REMAINING POTENTIAL BEYOND 2020

In the commercial, public, residential buildings and industry sectors, more than 15 TWh of primary energy savings potential remains after 2020. However, achieving these potential savings is likely to be increasingly challenging, as the most cost-effective measures are expected to be taken up before 2020. The analysis shows that post-2020 the continued implementation of packages of measures, rather than individual measures, will be the most successful approach. This will increase the effective economic potential, achieving deeper retrofits in the buildings sectors and mitigating to some extent the problem of early uptake of the most cost-effective measures.

It will become increasingly important to engage 'less aware' consumers post-2020 who will account for a larger share of the remaining savings potential. In the scenarios meeting the 2020 target, there is little uptake beyond 2025, with around one-third of the total potential not taken up in the absence of further government intervention. The results indicate growing importance of well-designed regulations and policies to increase engagement after 2020.

It should be noted, however, that reductions in the cost of existing technologies from electric vehicles to solid wall insulation may mitigate this trend to some extent. In addition, new technologies not considered here may significantly increase the technical potential savings, even among consumers implementing all the energy efficiency measures in the cost curves presented here. These topics should be the subject of further ongoing investigation.

This detailed analysis was carried out on behalf of SEAI by Element Energy.

To download a copy of the full report **Unlocking the Energy Efficiency Opportunity** visit [www.seai.ie/energydata](http://www.seai.ie/energydata)



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