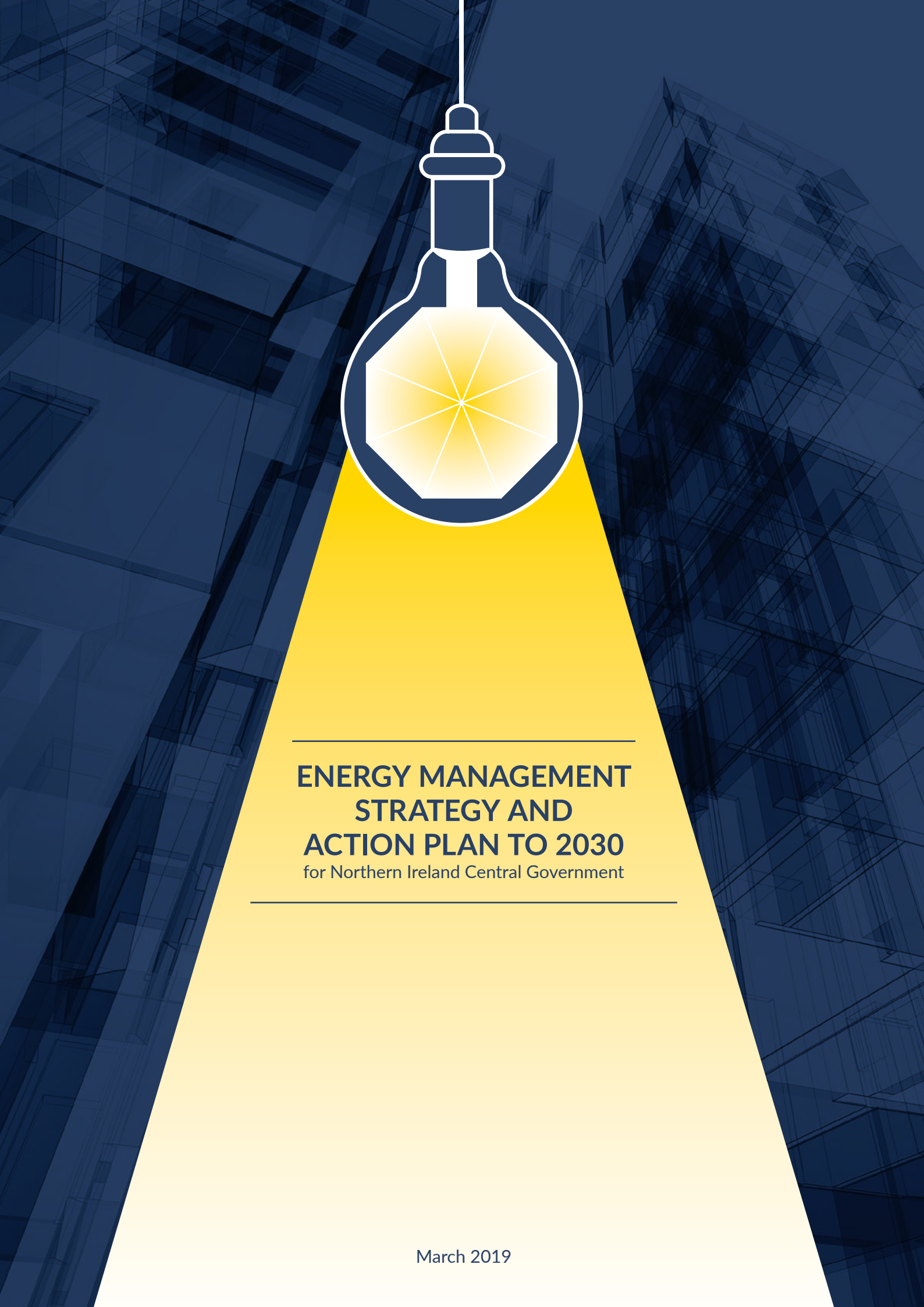


ENERGY MANAGEMENT STRATEGY AND ACTION PLAN TO 2030

for Northern Ireland Central Government

March 2019

Contents

EXECUTIVE SUMMARY

Background

In September 2016, the First and deputy First Minister agreed the 2016/17 Asset Management Strategy Action Plan. This included an action to undertake a review of energy management opportunities across public assets in order to:

- **reduce demand and costs**
- **generate revenue**
- **provide a road map for delivery of energy and cost savings.**

Target setting associated with this involved sophisticated simulations of interventions at individual building level based on robust consumption and pricing data.

This Energy Management Strategy and Action Plan (EMS) is the product of:

2 years
of collaboration **involving:**

110
public bodies

3051
publicly occupied assets

that in 2016/17 consumed
1867 GWhs of energy

at a cost of
£123 million

The Opportunity

Central government is the largest aggregated energy consumer in Northern Ireland. The EMS offers the opportunity to:

provide leadership on energy efficiency

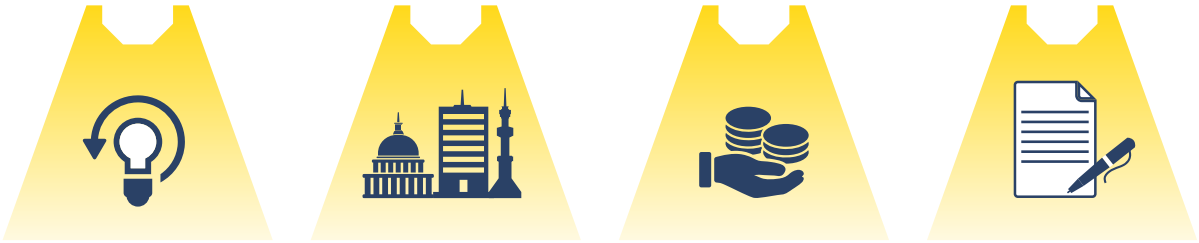
drive downward pressure on costs

improve decarbonisation efforts

In a context of rising energy prices – in which maintaining the status quo will guarantee cost increases – embracing energy management is an imperative to ensure Government achieves value for taxpayers. Apart from the financial benefits, energy management also contributes to the draft Programme for Government (PfG) through reduction of greenhouse gas emissions and enhancing security of energy supply. In addition, it directly supports wider UK Government objectives on energy and climate action.

The key message to leaders in Central Government

Extensive support and expertise are available. By fully mobilising these resources you can:



understand your energy use better

identify and prioritise investment opportunities

explore funding options

create quality business cases

This will allow you to make well-informed and co-ordinated investment decisions on cost-efficient energy consumption reduction projects.

Benefits

1. Implementing this strategy can deliver benefits in four areas: financial, strategic, environmental and operational. The scale of these will vary depending on the level of funding available.
2. Energy-saving projects will deliver ongoing yearly cost savings, while:
   - reducing consumption; and
   - lowering carbon emissions.
3. Improved management processes and behavioural change across Government offers the potential for further savings – most of which can be attributed to low and no-cost measures.
4. Building skills capacity and capability should deliver a tangible benefit for many years to come.

Aims

1. Support and significantly accelerate actions to maximise exploitation of energy efficiency opportunities in both current and future assets.
2. Work towards improved governance, accountability, strategic management and reporting arrangements for sustained longer-term success.

Objectives – defining success

Two key objectives will determine the success of this Strategy and Action Plan:

1. 

Establishing effective energy management processes that unlock value.

2. 

Lowering net energy consumption[1] by 30% by 2030 across Government (from a 2016/17 baseline year).

Progress against this 30% target will be assessed annually and will be informed by robust consumption data.

Let's look at these in terms of their strategic, operational and financial implications.

[1] Net energy consumption means energy consumed less energy generated.

Strategic

- aligning the management of our own energy use with wider energy policy responsibility
- committing to a target of 30% net energy consumption reduction
- creating a monitoring and reporting regime based on robust data that will promote greater accountability and underpin success

Operational

- exploring and implementing low-cost and no-cost energy consumption reduction initiatives
- focusing existing expertise and building long-term capacity to access and analyse data, and improve standards
- using Government buying power to promote innovation and 'invest to save' to deliver financially attractive projects that will reduce energy consumption

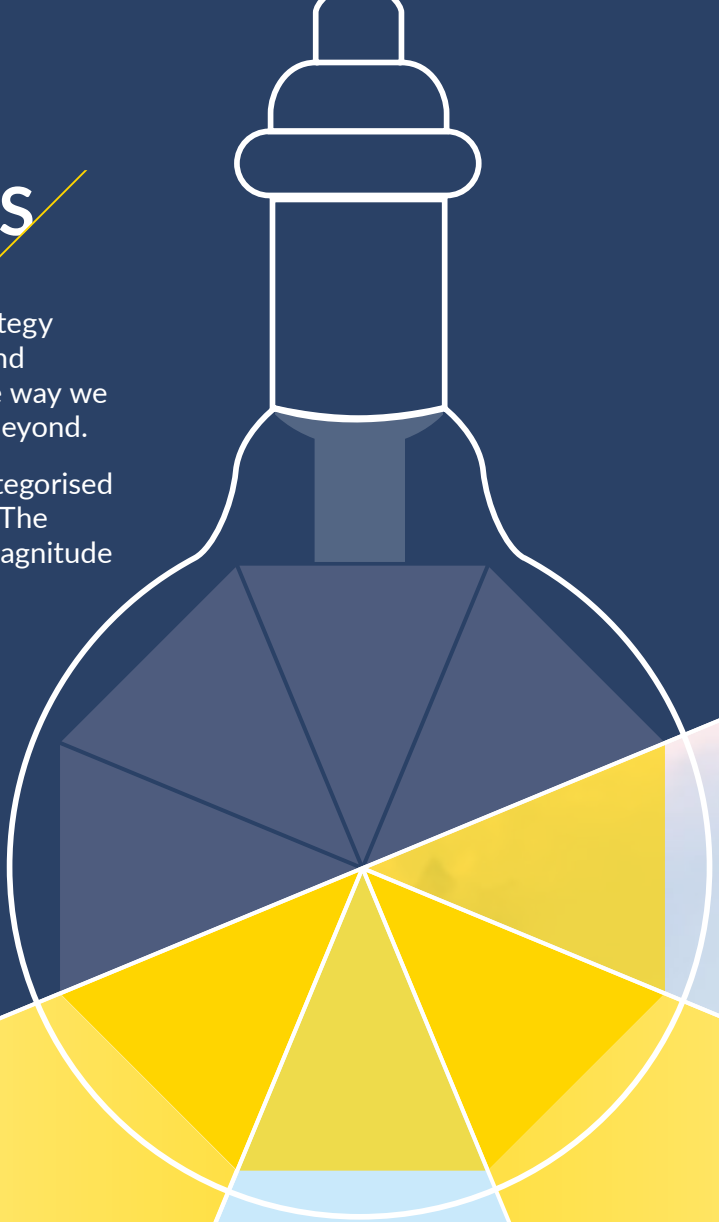
Financial

- to spend the same on energy in 2030 as we do today we need to invest **£370m** to achieve at least a 30% reduction in energy consumption, primarily targeted towards high energy users such as Health, Infrastructure, Education, Justice and Economy
- this level of investment will achieve a recurring annual saving of approximately **£37m**

RECOMMENDATIONS

To support the delivery of the objectives, the Strategy proposes the following set of recommendations and corresponding actions. These will both change the way we manage energy and sustain success to 2030 and beyond.

In the main report, all of the actions have been categorised as either Optimise, Small Change or Step Change. The purpose of this categorisation is to highlight the magnitude of the actions required and indicate the authority required to carry out the actions.



1 Ensure that **ownership for strategic energy management** across the estate is aligned with wider energy policy responsibilities.

ACTIONS

- → Agree arrangements for the ownership and oversight of energy management in Government.
- → Commence a behavioural change campaign.
- → Undertake a midterm review of this strategy.
- → Legislate for mandatory responsibility if necessary and when appropriate.

2 Adopt a net **energy consumption reduction** target of **30%** by **2030.**

ACTIONS

- → Provide an impetus for raising ambition and driving performance by implementing this net reduction within the set timeframe.
- → Introduce legislation for a target if necessary and when appropriate.

3 Establish an **Energy Management Unit (EMU)** to help Departments develop potential energy-saving opportunities, and maximise energy efficiency skills and measures across Government.

ACTIONS

- Bring together existing resources to form an energy support function for Government that will continue to build skills capacity and capability, and sustain momentum for energy efficiency.
- In its first two years, the EMU will use improved data collection and analytics to identify best value energy consumption reduction projects for Government and work with stakeholders to bring forward improvements that will develop immediate behavioural change through low and no-cost measures.
- It is envisaged that an EMU would need a staff complement of 4 or 5 in this period and would offer a menu of energy expertise services for Departments to select, as required.

4 Mandate **annual reporting of energy consumption** against a **30%** reduction target to the NICS Board and/or NI Executive.

ACTIONS

- Put in place processes to improve and sustain energy data collection, monitoring, targeting and reporting across Government.
- Utilise existing departmental Asset Management Plans to present key energy data and ensure alignment with operational investment initiatives.
- Produce an Annual Energy Report to provide the NICS Board and/or the Executive with a means of tracking progress and assessing performance.

5 Develop a **pipeline of energy reduction projects.**

ACTION

- Ensure that effective co-ordination of skills across Government identifies cost and energy efficiency opportunities and produces information of a quality suitable for business case preparation across a range of energy reduction projects.

6 Create an **Energy Invest to Save Fund.**

ACTIONS

- Set investment criteria and benefits appropriate for an Energy Invest to Save approach to funding.
- Develop energy efficiency and energy buying procurement opportunities.
- Examine the potential for generation and storage across the Government estate.

7 Develop better **energy buying.**

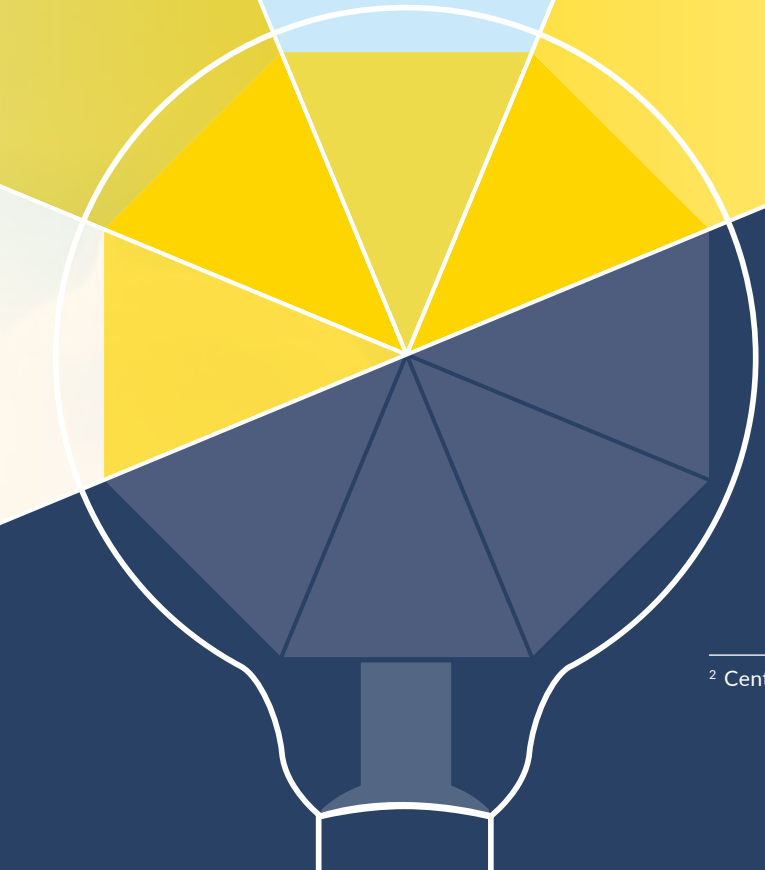
ACTIONS

- Improve collaboration between CoPEs[2] and Departments focussing on the pre-procurement phase and appreciation of risk.
- Access to specialist services and establishing an Energy Buyers Group.

8 Work in **collaboration with relevant partners** to ensure **building standards** contribute to the **30%** energy consumption reduction target.

ACTIONS

- Include operations and facilities management staff at pre-business case stage.
- Undertake a review of energy specifications in use across Government essential to sustain the delivery of the consumption reduction target.



[2] Centers of Procurement Expertise.

What does success look like?

A significant reduction in energy consumption will:

save money

mitigate risk and uncertainty

help deliver PfG outcomes.

INTRODUCTION

In November 2016 the Northern Ireland Civil Service (NICS) Board approved the commissioning of the first phase of an Energy Programme to review the opportunities across the NI Central Government estate[3] to reduce energy demand and costs, generate revenue from energy management opportunities and provide a road map for delivery.

In June 2017, the Asset Management Unit (AMU) of the Strategic Investment Board (SIB) presented Phase 1 of the programme, setting out the baseline position and potential recommendations and priorities for Phase 2, the focus of which is to develop an Energy Management Strategy and Action Plan (EMS) for Government to identify how to reduce resource budget pressures in future years.

[3] This includes all Departments, Arm's Length Bodies (ALBs) and Non Departmental Public Bodies (NDPBs). Collectively they will be referred to as "Government" in this strategy. Councils are not included.

STRATEGY DEVELOPMENT

This EMS is the result of an intense period of work with Departments and their Arm's Length Bodies (ALBs). In all, 110 bodies[4] were part of this work, covering 3,051 publicly occupied assets. The EMS is inward-facing, therefore all Departments, and ALBs are within the scope of the strategy. 'Energy' refers to the static consumption of electricity, gas, oil and other heating methods (biomass, etc.). Transport fuels and water consumption are not included in the EMS, nor is Local Authority energy consumption. The strategy development process is summarised in the diagram below.

One of the fundamental building blocks of preparing this strategy was understanding current demand. To this end, there was a significant data collection exercise on both cost and consumption.

This has shown that across Government for the 2016/17 year:

(i) **the cost of the energy consumed was £123 million**

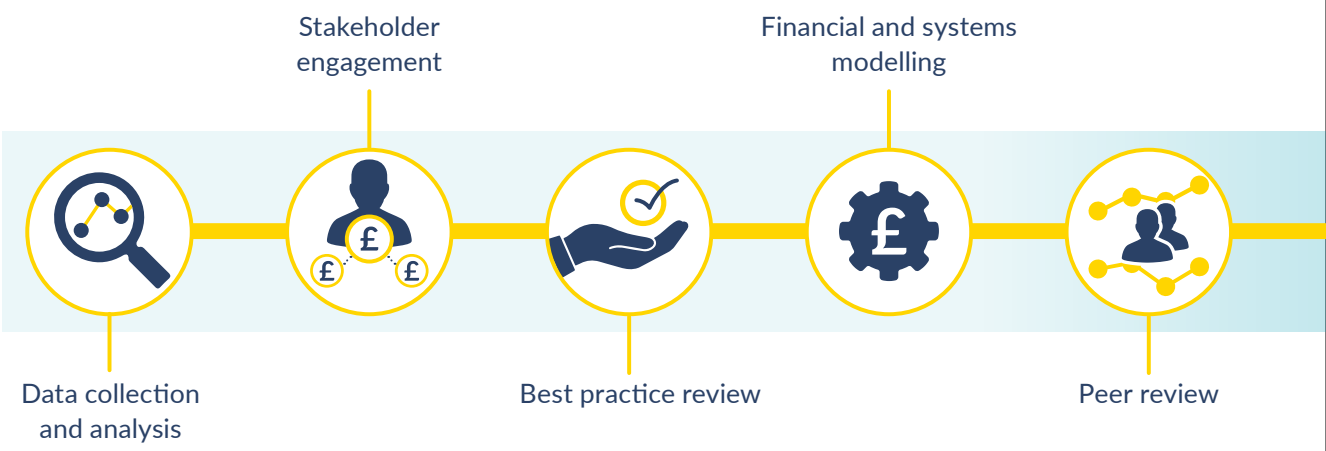
(ii) **the consumption was 1867 gigawatt hours (GWhs)**

(iii) **the resulting CO_2 emissions equated to 460 ktCO2e[5].**

There are real opportunities now to manage the risk that rising and volatile energy costs pose for Government.

The strategy development process involved significant stakeholder engagement. One element of this was establishing an Energy Management Forum[6] (EMF) to provide ongoing collaboration and input from government stakeholders throughout the life of the development of the strategy. Senior nominations were proposed by Departments' Permanent Secretaries to cover key energy functions across all sectors of the Government estate. The Forum met monthly since September 2017. Three sub-groups were established to provide subject matter expertise and to ensure as broad a range of stakeholders as possible was part of the engagement.

EMS Strategy Development Process



[4] The list of participating bodies is attached at Annex A.

[5] This indicative value was calculated by DAERA in line with the methodology used to calculate greenhouse gas (GHG) emissions as per the NI GHG inventory and the GHG emissions projections tool https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ni-ghg-projection-tool-update-2017.pdf

[6] The governance structure adopted for the development of the strategy is set out in Annex B.

The three sub-groups were:

- **Procurement, Commercial & Financial**
- **Technology & Generation**
- **Policy, Governance and Regulation**

The sub-groups were specifically tasked with considering key issues and bringing forward suggestions and proposals that would inform the final recommendations. In addition, a peer review panel, made up of energy and carbon subject matter experts in a range of neighbouring jurisdictions as well as local expertise, acted as a critical friend.

STRATEGIC OBJECTIVES

Energy management should be a fundamental part of the efficient operation of the government estate. It can reduce financial costs, support security of supply, earn additional revenues and reduce environmentally harmful emissions.

A structured approach to energy management therefore makes both financial and environmental sense. Using less energy and being better informed about the energy we consume is the most cost-effective and achievable way to address rising energy bills, and help reduce Government's dependency on energy derived from fossil fuels that are both unsustainable and environmentally harmful.

The strategic objectives of this strategy are:

(i) **MANAGEMENT** – establishing effective energy management processes that unlock value.

(ii) **COST REDUCTION** – Reducing net energy consumption by 30% (from a 2016/17 baseline year) by 2030 across Government.

In developing the strategy aligned to the cost and management objectives, the approach taken has been to baseline the existing challenges and opportunities and propose interventions that will realise benefits for government as quickly as possible.

Maximising the reduction in net energy costs requires a reduction in:

- **the energy usage** (i.e. the amount of energy consumed) and/or
- **the cost of the energy supplied** (i.e. pay less per unit of energy consumed).

A combination of both, and consideration of the energy mix, will be the most efficient method to maximise cost savings for government in the long term.

In parallel, improvements to policy, management, governance and accountability can also play a pivotal role in achieving energy, cost and carbon savings through leadership in strategic energy management. To achieve the aims of the EMS they would need to be adopted at a strategic management level and supported by better reporting and appropriate governance structures.

Furthermore, consideration of alternative investment and appraisal criteria for capital projects is likely to be necessary. In operational terms, modifying procurement processes and improving building standards for the estate occupied by Government will be needed, as well as targeting low-cost and no-cost behavioural change across organisations.

THE NEED FOR CHANGE: A CO-ORDINATED APPROACH

By adopting this approach, Northern Ireland would become aligned with other jurisdictions. Energy management and reducing energy consumption across the Government estate have been challenging - particularly as responsibility for the promotion of energy efficiency across NI, as a whole, rests with four[7] different organisations. Also, historically, in the Government estate, there has been very little investment in energy efficiency.

NI differs from other regions through this disaggregated ownership by senior management and the limited integration of energy management into wider Government business planning. While some energy information is reported through Asset Management Plans (AMPs) at Departmental level, there is no centralised collation, ownership or reporting of energy management information.

In addition NI also differs from other regions in that there is an absence of energy policy beyond 2020 coupled with no specific NI targets for either energy or carbon. The Department for the Economy's (DfE) Strategic Energy Framework 2010-2020 (SEF) is the current key policy document. It states that NI will contribute to the UK's energy saving target of 18% by 2020 (equating to 1.5% energy savings per year at UK level from a 2007 baseline) as set out in the UK's National Energy Efficiency Action Plan.

Currently NI contributes to this target through:

- building regulations
- energy efficiency improvements to residential social housing
- the Carbon Reduction Commitment (CRC)
- energy efficiency savings from the NI Sustainable Energy Programme (NISEP) of 2 TWh from 2014-2023, against a UK total of 442 TWh for the same period.

DfE are in the early stages of development of a new Energy Strategy for NI, however the timeline for publication is unknown.

[7] The four organisations are Department of Finance (public sector), Department for the Economy (community and voluntary sector), Department for Communities (housing sector) and Invest NI (industry sector).

ENERGY CONSUMPTION: FLAT FOR SIX YEARS

Energy consumption across Government has remained broadly consistent across each of the last six years (from 2011/12 to 2016/17).

Across the full range of buildings for which robust data was collected, the average energy use per m^2 of floor area is:

- 65 kWh/m^2 for electricity
- 181 kWh/m^2 for gas
- 55 kWh/m^2 for oil

TOTAL 301 kWh/m^2

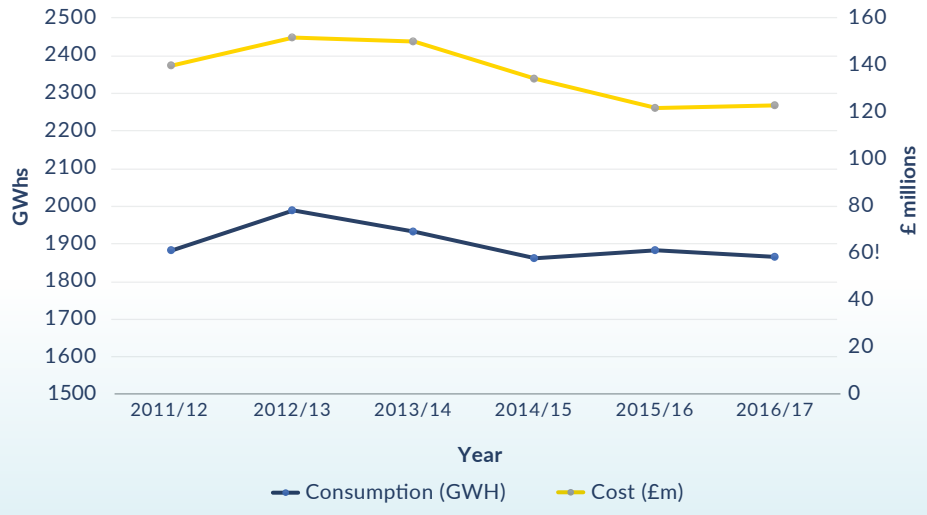
Comparing this to industry standards[8] and building energy use indicators (by building type) from other jurisdictions, appears to indicate that energy use across Government is slightly higher than the UK average. (However, it should be noted that there is considerable variability in benchmark categories and methodologies[9] across the UK.)

For example, the Department for Business, Energy and Industrial Strategy (BEIS) Building Energy Efficiency Survey reports on the non-domestic building stock in England and Wales in 2014/15. The latest report was published in November 2016 and benchmarked median total energy intensity for health buildings as 201 kWh/m^2, yet in NI the median total energy intensity for the Department of Health's buildings is 220 kWh/m^2.

Returning to the total consumption across Government, the trend of almost-flat levels of energy consumption over the last six years suggests that **energy efficiency opportunities are not being exploited,** and the scale of any current energy efficiency interventions, while realising some financial savings, has not been of a sufficient scale to have any substantive impact on the total energy consumption across the estate. This is despite a requirement for an exemplary role by public bodies' buildings – as set out in Article 5 of the 2012 Energy Efficiency Directive[10].

Coincidentally, during this time, energy prices fell, and therefore so did the corresponding total annual energy bill incurred by Government (with the exception of 2012/13, when there was a small increase). This is despite there being no significant reduction in energy use over these six years, evidencing the risk of volatility and price inflation. This is set out in the graph below:

Figure 1: Cost and Consumption 2011-2017



[8] CIBSE TM 46 – Energy Benchmarks

[9] SIB carried out a review of benchmarking methodologies in May 2018 and this is available separately.

[10] Article 5 of Directive 2012/27/EU of 25 October 2012: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012L0027&from=EN and as transposed through The Energy Efficiency (Eligible Buildings) Regulations 2013 www.legislation.gov.uk/uksi/2013/3220/pdfs/uksi_20133220_en.pdf

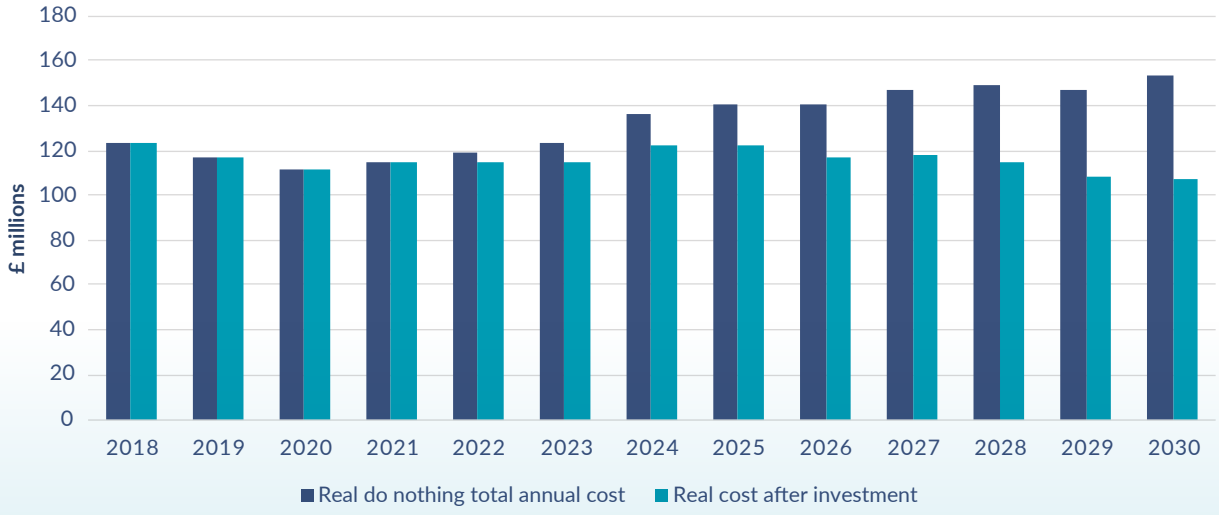
THE COST OF DOING NOTHING

An important part of this strategy is enabling mitigation measures as part of robust risk management. As energy prices have been at a historical low over most of the period 2011-2017 this has resulted in a parallel cost reduction of 12% over this period for Government. Therefore, if consumption remains at an equivalent level going forward but energy prices increase (as is widely predicted[11]), there could be a cost increase of £31 million in real terms between now and 2030, which would likely become a significant additional budgetary pressure.

There are clearly risks associated with non-action, in particular the exposure to future price increases and volatility in energy prices. Therefore it is timely that effective risk mitigation, investment and management approaches for both managing energy costs and energy consumption reduction are now considered.

The graph below shows the impact of doing nothing compared to a 30% reduction (essentially a standstill position where consumption continues at current levels). This assumes energy price inflation in line with the All Island Single Electricity Market (SEM) price projections[12]. Without intervention to reduce consumption the annual cost is projected to rise to £154 million by 2030.

Figure 2: Cost of doing nothing vs investment to achieve a 30% energy consumption reduction



[11] As predicted by industry standard wholesale electricity market price modelling projections.

[12] Note that the reference index used to forecast energy prices in the SEM between now and 2030 is modelled on wholesale market prices (known as the System Marginal price (SMP)) for electricity price. However, given that SMP follows closely the gas price and that the energy consumption is split almost equally between electricity and gas across Government, it has been assumed that the SMP price for the All Island Single Electricity Market (SEM) is a reasonable proxy for the total combined cost of all energy in Government. It also assumes the continuation of the SEM post-Brexit.

THE RATIONALE AND COST OF SETTING A 30% ENERGY CONSUMPTION REDUCTION TARGET BY 2030

This Strategy is primarily a cost-saving one therefore the 30% energy consumption reduction target was selected to ensure that Government does not spend any more on energy in real terms in 2030 than it does today. This target maximises the opportunity to offset expected price increases and the risk posed by market volatility. Modelling confirmed that at least a 30% reduction in energy usage is the level required to ensure this.

Delivering this overall target demands a SMART approach. Building-specific energy efficiency targets reflect each building's unique opportunity to make savings, taking account of building type and the average service-related energy needs in each sector. This tailored approach is grounded in robust statistical analysis of energy consumption and estates data from 3,051 public sector buildings across Northern Ireland.

With each asset categorised into a specific 'use' category it is then compared only to its peers. Each category has a spread of assets with good performers, average performers and bad performers. The modelling validated that if poor performers improved to average and average improved to good etc. then the 30% consumption reduction SMART target is easily achievable.

This 30% reduction and 2030 timeframe have been selected as an achievable target (subject to funding being available to support interventions) across the range of energy users examined. It is also in line with other jurisdictions and allows for an incremental approach year on year. The SMART target setting methodology is summarised below:

Specific	Each individual building is allocated a specific energy reduction target, based on its usage type and historic energy performance compared to data on the performance of similar buildings across the NI Government estate.
Measurable	Performance against target will be monitored for each building and for the estate as a whole. The optimal model targets 30% overall consumption reduction across the entire estate by 2030 to offset resource budget impacts of future energy price increases.
Achievable	The methodology uses a tiered approach to maximise likelihood of success. Buildings with relatively poor energy performance are targeted more aggressively than better performing buildings. The model accounts for risk that some buildings may miss targets.
Relevant	Energy performance targets are tailored to be relevant on a like-for-like basis. For example, hospitals are compared to other hospitals, schools compared to other schools. This ensures targets account for different baseline energy performance.
Time-bound	The intervention period is 12 years. Annual monitoring and target adjustments will help to ensure optimal savings from each building. A modelling tool has been developed by SIB to aid and validate the monitoring process.

DELIVERABILITY

Achieving the target will require funding, combined with management changes and the direction of future government priorities. This 'invest to save' capital investment will be ranked and prioritised to ensure a focus on achieving the greatest consumption reductions, and delivering "quick wins" with short payback periods. An essential part of this will be to mobilise dedicated resources to identify and develop a register of capital investment projects across the estates which can deliver large-scale, enduring savings over the longer term. These projects will be subject to expert scrutiny to understand the technical and financial feasibility, including capital costs, operational savings, benefits and the practicalities for implementation.

In addition, savings will be delivered through low and no-cost measures. These include the following initiatives which will be pursued in advance of significant capital programmes as a way of building confidence and reducing inefficiencies early in the implementation of this Strategy and Action Plan:

- behavioural and procedural change
- awareness and training
- bill validation and cost recovery
- optimising procurement and buying strategies
- use of specialist advice and support
- increased scrutiny of costs
- installation and appropriate use controls for lighting and heating, ventilation and air conditioning (HVAC).

Since there have been limited historic activities in these areas on the Government estate, there is limited empirical data defining their impacts. However information from other estates and service providers suggests these low and no-cost measures can contribute up to 10% in cost savings. For example Belfast Health Trust appointed Horizon Energy Group to provide them with improved energy buying strategies and bill validation. In 2017/18 this realised c.£250K of cost savings for the Trust, with £42K of these savings coming from bill validation alone. The cost to the Trust was c. 3% of the savings. We know in Ireland, the Optimising Power @ Work programme, reports an annual energy reduction of 21% in

2030 CONSUMPTION REDUCTION SCENARIOS

	BASELINE	**Scenario 1 –** 9 Year Investment (2021 – 2030)	**Scenario 2 –** 4 Year Investment (2021 – 2025)
Consumption	1867 GWh	1307 GWh	1307 GWh
Annual Investment	£0	£41m	£92m
Cumulative Savings by 2030 (*minus indicates a cost)	-£123m	£95m	£199m

270 large public buildings. This has been achieved by combining behavioural changes, investment in technology and specialist support. However it is not feasible to achieve the 30% energy consumption reduction target without investment, on an 'invest to save' basis.

The **table on your left,** summarises three 2030 scenarios considered. These scenarios were developed on the following basis.

- **Baseline scenario** – assuming no energy reduction consumption
- **Scenario 1** – Nine Year investment 2021 - 2030: this is based on two years of mobilisation and procurement followed by delivery each year to the target date in 2030
- **Scenario 2** – Four year investment 2021 - 2025: as with Scenario 1 above two years is assumed for mobilisation and procurement followed by delivery of measures within the four years of the next Comprehensive Spending Review (CSR) period with measures completed by 2025.

The **table on your left**, shows that without investment and associated consumption reduction there is an additional annual operating budgetary pressure (RDEL) for Government (due to predicted increases in energy prices). This equates to £123m of cumulative additional expenditure (in real terms) over the 12 year period, 2018 to 2030.

To offset the baseline real cost increase of £123m through investment only, investment of £370m (in real terms) is estimated to be required to give more certainty to the delivery of a 30% energy consumption reduction target by 2030. Additional savings may be delivered through low and no-cost measures. This estimate has been derived from information available from previous NI public sector and third party energy payback benchmarks. These have been used to estimate the costs of achieving and delivering the 30% reduction target. These benchmarks demonstrate attractive paybacks (less than 10 years) justifying initial capital investments and delivering long term ongoing savings and energy consumption reductions.

The long-term benefits of investing more earlier with a large investment over a shorter timescale (as in Scenario 2) secures larger savings and reaps the benefits of lower energy bills compared to more gradual spend over the period. This is mainly due to making interventions earlier aligned to the fact that prices are predicted to increase meaning these interventions capture larger savings and for longer. Scenario 1 has a lower annual cost as investments are spread over a longer term but delivers lower savings compared to Scenario 2. It is worth noting there are other approaches potentially available such as Energy Performance Contracts (EPC) whereby the private sector will guarantee energy savings.

IMPLEMENTATION

The aim of this EMS is to support and significantly accelerate actions to maximise the successful implementation of energy efficiency opportunities from both current and future assets, while working to support improved governance, accountability, strategic management and reporting arrangements for sustained longer-term success.

This should positively impact on the NI Executive's ability to meet their draft Programme for Government (PfG) commitments, as well as contributing to bringing Northern Ireland into line with wider UK and EU policies in this field.

The strategy seeks to:

- ensure that opportunities with the greatest energy and cost savings potential for public expenditure are prioritised
- provide an opportunity for Government to demonstrate an important emissions reduction contribution to both the draft PfG indicator 29 (Greenhouse gas emissions) and the UK wide Climate Change Act to reduce greenhouse gas emissions by at least 80% by 2050
- maximise opportunities that are common to all public bodies, by ensuring plans and processes are in place to assist delivery of savings through consumption reduction and management processes that better unlock value.

The benefits of this EMS will only be fully realised with a co-ordinated approach across the whole of government that promotes strategically targeted actions in order to deliver the best return in the period ahead.


3.

BASELINE

This section sets out the baseline in terms of a number of factors including current energy consumption, cost, management, previous initiatives and procurement. It draws on the data collected as well as the significant stakeholder consultation with Government, industry, and academia in Northern Ireland and across England, Scotland, Wales and Republic of Ireland. The opportunities arising from this synopsis of the current baseline position are dealt with in the subsequent chapters of the Strategy.

FACTOR: COST AND CONSUMPTION

Baseline energy consumption and cost data was collected for 3,051 estate buildings, facilities and assets. The total consumption and cost for Government in 2016/17 is estimated at:

- 1867 GWh
- £123 million
- 460 $ktCO_2e$

Current energy management and monitoring arrangements at building level were recorded and existing generation from low-carbon technologies, standby generation and other energy assets across the estate have been mapped.

This robust data has previously not been available. Going forward, it is possible for consumption to be monitored reliably against the 2016/17 baseline at building level[13].

Some **96%** of the annual energy consumption is split across five departments:

Department of Health (DoH)	**39%**
Department for Infrastructure (DfI)	**25%**
Department of Education (DE)	**21%**
Department of Justice (DoJ)	**8%**
Department for the Economy (DfE)	**3%**

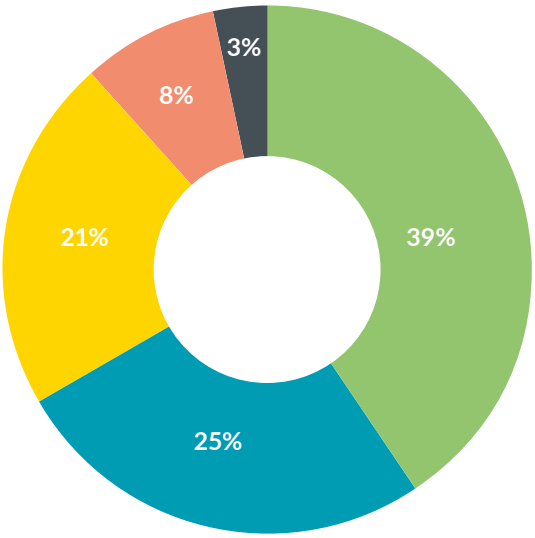
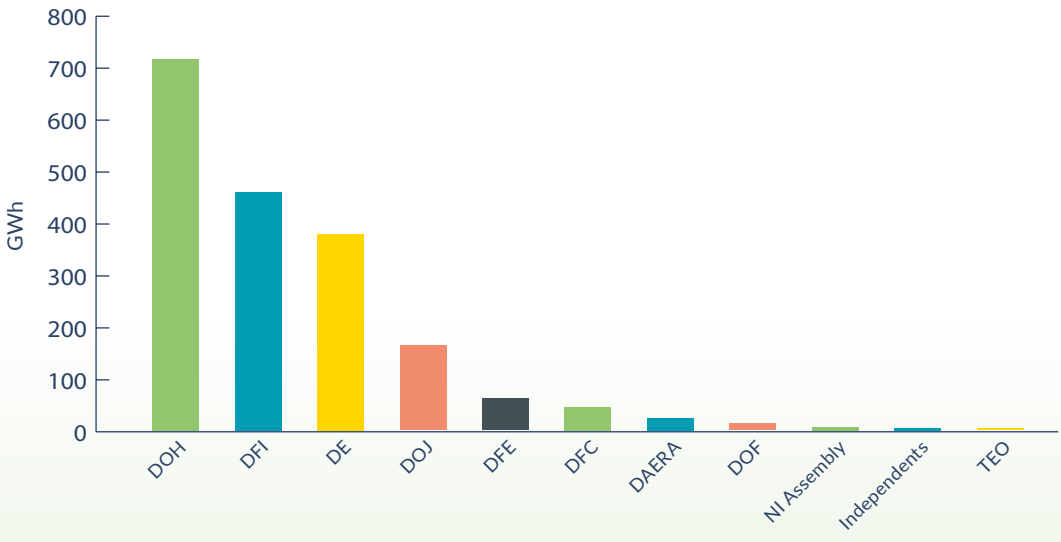


Figure 3: Energy Consumption split by Department



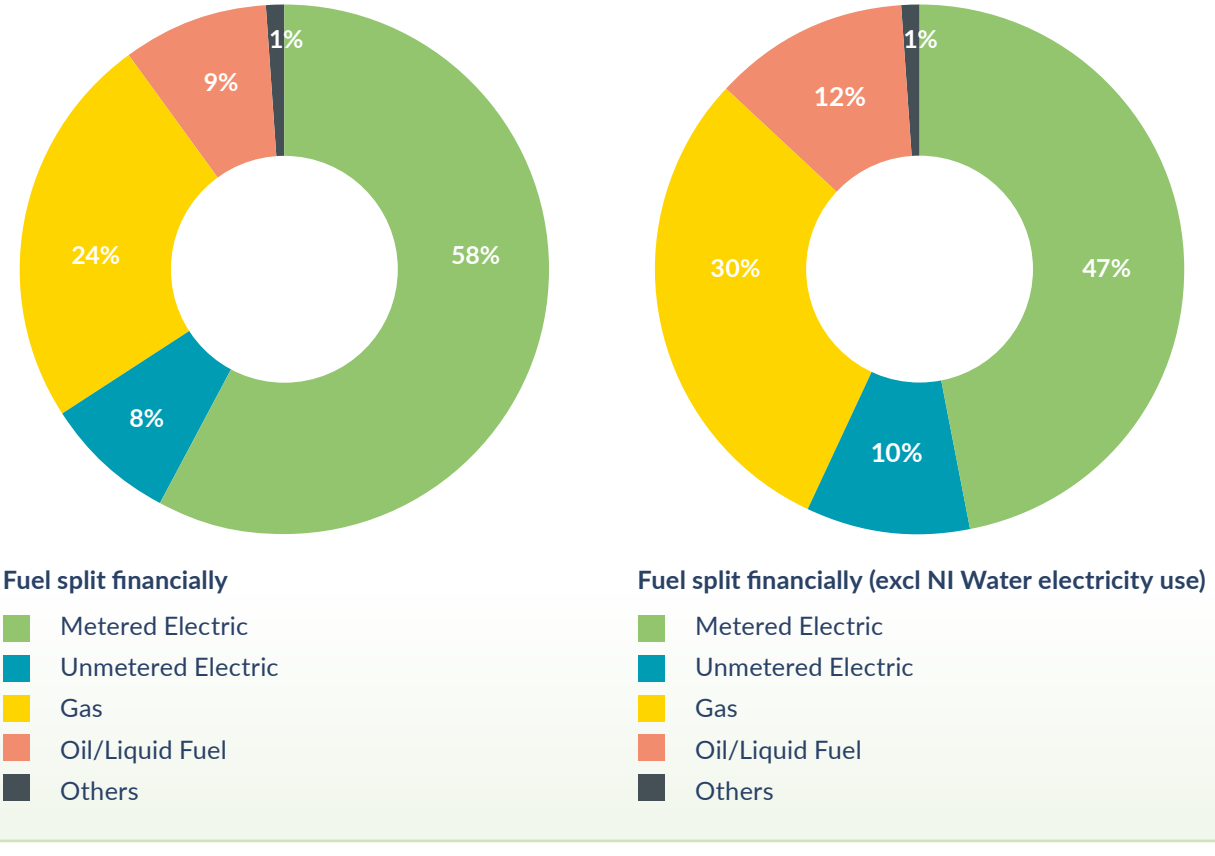
[13] It should be noted that all data collected and analysed is raw consumption data and it has not been weather or occupancy corrected.

Given that such a high percentage of energy consumption is split across only five Departments, it is recommended that interventions focusing on energy savings in the Health, Infrastructure, Education, Justice and Economy sectors are prioritised in the short term.

The total annual cost of energy in Government is £123 million. When split by fuel type, the largest cost is attributed to electricity, where the total (metered and unmetered) equates to c. £81 million.

It is worth noting that if NI Water[14] which sits within DfI is excluded from the analysis, the gas/electricity distribution is more evenly split. The graphs below show the % fuel split financially, including and excluding NI Water.

Figure 4: Fuel split financially, including and excluding NI Water.



[14] NI Water is the single largest user dominated by electricity use (98%) with an annual bill of c.£30m. NI Water's inclusion in the Government total has a disproportionate effect.

FACTOR: POLICY, GOVERNANCE & MANAGEMENT

In NI, responsibility for the promotion of energy efficiency in the public sector is the statutory responsibility of DoF. This is described in legislation[15] as "DoF may take such action as it thinks appropriate for the purpose of promoting the efficient use of energy by public bodies."

Energy efficiency promotion responsibilities are fragmented, and the split of energy efficiency promotion responsibilities across Departments is set out here:

Department	Statutory responsibility for promoting efficient use of energy
DoF	by public bodies
DfE	by the voluntary and community sector
DfC	in the domestic sector
Invest NI	in Industry

In addition, DAERA leads on Greenhouse Gas (GHG) emissions reduction reporting, the Carbon Reduction Commitment (CRC)[16] (which is due to end in 2019) and climate change policy. While improving energy efficiency in Government will clearly contribute to wider climate change goals (and in particular Indicator 29 of the draft Programme for Government[17] on greenhouse gas emissions), the current fragmentation is likely to lead to sub-optimal outcomes.

Unlike in neighbouring jurisdictions and in the majority of energy-intensive businesses in NI, there is currently no energy efficiency target[18] nor an energy efficiency strategy for the whole of Government despite the statutory responsibility. Some Departments and ALBs are setting energy consumption reduction targets, but in many cases these are not formalised or adopted. The current energy saving targets across Government are set out on the next page.

[15] Currently legislative responsibility for the promotion of energy efficiency is set out in the Energy Efficiency (NI) Order 1999 order. This was amended in December 1999 following a reorganisation of NI Departments by a Statutory Rule known as the Departments (Transfer and Assignment of Functions) Order (Northern Ireland) 1999, which resulted in placing statutory duties for the promotion on energy efficiency on three main Departments. In 2002 it was amended further through the Industrial Development Act (NI).

[16] The CRC Energy Efficiency Scheme is a mandatory UK scheme aimed at improving energy efficiency and cutting carbon dioxide (CO_2) emissions in large public and private sector organisations. It applies to organisations with electricity consumption greater than 6000 MWhrs/year. It is designed to encourage organisations to develop energy management strategies that give them a better understanding of energy usage and to reduce CO_2 emissions not already covered by climate change agreements (CCAs) (www.gov.uk/climate-change-agreements) and the EU Emissions Trading System (EU ETS) (www.gov.uk/participating-in-the-eu-ets). Participants must pay for or surrender allowances ("buy to comply") to cover their CRC emissions (in tonnes of CO_2). In effect this follows the "Polluter Pays" Principle.

[17] www.northernireland.gov.uk/consultations/draft-programme-government-framework-2016-21-and-questionnaire

[18] At present NI contributes to the UK national target (derived from the EU EED) which represents an 18% reduction in final energy consumption, relative to the 2007 business as usual projection and covers action across all sectors, including the public sector. Any savings made from Government will be included in this target.

Department / ALB	Energy target	% of total energy consumption across NI Central Government
DoH	Requires **all** electricity to come from renewable sources	39
Education Authority	Energy Efficiency Plan exists **but does not contain a target** and has never been formally adopted by DE.	20
NI Water	There is a general mitigation measure to **"use less energy"** and a target for NI Water to increase electricity consumption from renewable sources to 40% in 2020/21.	16.2
DfI Street lighting	Target for 2018-19 to 'Reduce the average energy consumption per street light / illuminated sign unit by **2%** through the de-illumination of traffic signs and installation of LED lighting on capital schemes.	5.8
PSNI	**To decrease energy consumption per m^2 by 30%** by 2020, relative to 1999/2000 levels. Currently reporting a 26% reduction.	4.2
DAERA	Previous Department of Agriculture Energy Strategy 2014-2019 still in place with targets of: (i) **15% reduction of CO_2** emissions, compared to 2010/11 baseline, over the next five years (ii) 15% of heat derived from renewable sources by 2019.	1.2
DoF	**5%** reduction in energy consumption across the office estate during 2017-20	0.7
TOTAL		48.3%

In recent years, energy consumption has been generally falling in the public sector in neighbouring jurisdictions in large part as a result of adopting, supporting and promoting energy efficiency. Since 2009/10, energy consumption in the public sector in England and Ireland has reduced by circa 20%. All other UK regions and Ireland have set either energy-saving targets or carbon reduction targets and made investment available to drive action in consumption reduction.

A recurring theme in all the other regions is the need for clear ownership of energy management within government and its associated public sector organisations. The table below sets out the key aspects of other regions' energy management frameworks in relation to public sector energy use.

	ENGLAND	SCOTLAND
Owner	**CABINET OFFICE/ DEFRA**	**SCOTTISH GOVERNMENT**
Target	**43% reduction in Greenhouse Gas (GHG) emissions for the public sector by 2020.**	**12% reduction in energy consumption by 2020 (met 6 years early and now reporting 15.4% reduction from a 2005/07 baseline). Currently achieving a 5% year on year energy consumption reduction across its public sector estate.**
Policies & Strategies	Clean Growth Strategy 2017. Interest free loans through the public sector energy efficiency loan scheme and a recycling fund. From 2013/14 to 2016/17, the scheme has provided over £235m funding for energy efficiency projects, working across 564 organisations.	Energy is a National Infrastructure Priority. Energy efficiency retrofit opportunity across the built estate of Scotland's public sector with a framework procurement for non-domestic energy efficiency contractors. 100% coverage with automatic meter reading. In 3 years c. 50% of Scotland's street lighting stock has moved to LED.
Savings/Costs	£340m savings estimated by 2020.	£300m fund with associated savings of up to £30 million per year.

	WALES	IRELAND
Owner	**WELSH GOVERNMENT**	**DEPARTMENT OF COMMUNICATIONS CLIMATE ACTION AND ENVIRONMENT**
Target	**80% reduction in GHG emissions from 2009/10 baseline by 2050.** **Public Sector to be carbon-neutral by 2030.**	**33% reduction in energy consumption by 2020 (reporting 21% achieved at end 2015) against a baseline of 2009/10.**
Policies & Strategies	Legal duty for sustainable development. Creation of a central pool of technical expertise support services. Collaborative energy procurement and a tendency to specify green electricity. Having a single Department responsible for delivery of Energy Efficiency programmes in Wales.	Publication of a public sector energy efficiency strategy with a target for the public sector in Ireland to improve its energy efficiency by 33% by 2020. Use of a support organisation (Sustainable Energy Authority of Ireland (SEAI)) to monitor and report on progress on public sector energy savings. Development of long-term building renovation strategy.
Savings/Costs	Green Growth Invest to Save Fund of £50-£80m/yr.	Avoided costs of €619m by the end of 2015. Savings of 2336 GWh and €133m in 2016.

As part of the development of the Strategy, an extensive review of the existing legislative framework, polices and strategies[19] was undertaken. This review identified that there are gaps in strategic energy management and policy implementation for Government in NI.

These gaps are summarised below.

Gap	Department Policy Area	Current Position
No mandatory requirement to publish public sector energy use.	DoF	DoF via the Public Sector Energy Campaign (PSEC[20]) did collect public sector data until 2013, but now DoF only collects information for 3% of the office estate, and publishes it internally.
No single Department has responsibility for overall energy efficiency / energy management.	DoF, DfE, DfC, Invest NI	Each Department should develop policies / programmes for the sector or assets they are responsible for.
DoF does not actively promote energy efficiency activity outside the managed office estate or to large energy users within NI Central Government.	DoF	DoF sponsors building regulations and provides technical guidance to Departments for capital projects but has no enforcement role and focuses efforts on the office estate.
Departments, as competent authorities, have a role to encourage the production of energy efficiency plans.	All	Two Departments (DoF and DAERA) have energy efficiency reduction plans in place. DoF does not actively encourage this across Government although there is some evidence of organisations considering energy use as part of other asset management/environmental processes, independent from their parent Department.
Long Term Building Renovation Strategy (as set out in the Energy Performance of Buildings Directive under the Clean Energy Package).	Unknown	NI does not have a long-term building renovation strategy. Departments unable to agree on where the responsibility sits.
Public sector energy reporting.	Unknown	Once CRC closes in 2019, there will be no mechanism to report energy use across the public sector. The private sector reporting mechanism has now been agreed and legislation will come into force on 1 April 2019. To date there are no plans to develop similar for the public sector in NI.

[19] A policy and legislative review has been carried out as part of the development process of the Strategy, and is available separately.

[20] PSEC was a key component of DoF's efforts to conform to the Energy Efficiency (Northern Ireland) Order 1999, which requires the department with responsibility for promoting EE within the "public sector" to take appropriate action. This campaign was set within the context of the Northern Ireland Executive's Sustainable Development Strategy 'Everyone's Involved', which contained a target to reduce Greenhouse Gas emissions by at least 25% on 1990 levels by 2025 www.nienvironmentlink.org/cmsfiles/policy-hub/files/documentation/Waste/Sustainable-Development-Strategy.pdf

Issues

1. Staffing

As part of the development process, stakeholder engagement operating through the Energy Management Forum identified that energy management teams are in general quite small and staff in these teams often carry out a range of energy and estate management duties. There is a limited pool of dedicated energy management staff and in general, energy management is not dealt with strategically at senior levels. Instead it is viewed and managed more as an operational matter.

2. Skills

When Departments procure specialist short-term energy expertise, this often addresses an immediate need but rarely leads to any significant skills transfer. An absence of centralised expertise in monitoring and reporting of energy consumption across Government leads to little upward reporting of energy use and cost to either the NICS Board or the Executive (although it is noted that DoF Properties Division do carry out this function for the office estate).

3. Expertise

At present it is likely that opportunities to maximise energy efficiency investment are missed due to a combination of a lack of expertise and investment planning. While there are pockets of expertise across various NI Departments and ALBs, current structures mean this is rarely shared between public sector bodies, and there is little opportunity for lessons learned to be disseminated.

Including energy in business planning at board level is good practice – but this is not commonplace across Government.

FACTOR: REPORTING AND MONITORING

The 2016/17 energy data collection exercise was the first time an energy dataset was collected for the entire Government estate since the 2012/13 PSEC exercise.

At present, no-one is tasked with collecting energy data and there are no plans to allocate this task. The only statutory reporting of energy consumption for the NI public sector is reporting on gas and electricity use (converted to emissions) under the UK Government's Carbon Reduction Commitment (CRC) scheme[21].

In the public sector the CRC includes NI Water, hospitals, education, justice etc. CRC reporting is coordinated by NIEA within DAERA, and while all departments are mandated, not all public bodies are included. For example, schools are not included. It should be noted that the CRC scheme is to be abolished in March 2019 insofar as it applies to public bodies.

Private sector mandatory reporting will continue across the UK and, while other parts of the UK have or plan to have replacements for public sector mandatory carbon reporting from the end of the CRC scheme, NI has no equivalent public sector reporting scheme, nor proposals for one. There is an opportunity for DfE to carry out this function for Government in a manner similar to their considerations for private sector carbon reporting.

Data collection systems and capabilities vary widely throughout the Government estate. The table below sets out the current position for electricity metering:

Meter Type	Number of buildings	% of meter population	Number of meters currently with direct consumer access to half-hourly data
Automatic half-hourly meters with data sent directly to utility for billing	1571	52%	280
Manually read meters	1480	48%	0
Total	**3051**		**280**

[21] It should be noted however that DoF does continue to collect and report on energy use in the managed office estate through the DoF Energy and Carbon reduction plan 2017/18-2019/20, but this is not published or reported outside of Government.

INFORMATION

Real-time automatic data collection capability is common throughout the DoF managed office estate, NI Water, PSNI and in parts of the health sector (Belfast Health Trust in particular). However, on the education estate, only 1.8% of the total number of electricity meters in use provide automatic half-hourly data directly to the Education Authority.

On large multi-building estates such as the Stormont Estate, hospitals, prisons, museums etc. it is common to have only a limited number of utility meters. On these estates it is good practice to have 'Sub-metering'[22]. This is not commonplace on the NI Government estate, resulting in poor understanding and management of energy information on many of the large estates.

As well as access to energy information, the capability to interrogate it is just as important. There are limited resources or data analytics capability within Government to use energy information in order to take informed decision-making. There are pockets of capability (e.g. within the Belfast Health Trust and NISRA) but this is the exception rather than the rule.

As there is limited need for reporting, there is inconsistent metering and monitoring. Of the 110 bodies that reported their 2016/17 consumption, there were many instances where it was necessary to raise queries in regard to the data and its accuracy. While a number of bodies have good monitoring systems, such as NI Water, PSNI, the managed office estate and parts of the health sector, this is not consistent throughout all estates. Nor are the methodologies used by each body.

The Asset Management Plans (AMPs) approved by Departmental Boards are an existing vehicle for reporting; and in some cases, energy data is included as recommended by the AMP guidance note[23]. However, this varies across Departments and tends to focus on energy costs rather than energy consumption.

FACTOR: INTERVENTIONS TO REDUCE COST

Core to the implementation of this Strategy will be utilising capital investment to generate savings. Not since PSEC effectively ended in 2013/14 has there been a co-ordinated cross-departmental capital programme aimed at reducing energy consumption and tackling harmful climate emissions on the Government estate. This is despite the principles of 'Invest to Save' being a key feature of budgets since 2010.

Invest to Save funding in Northern Ireland is an Executive-led initiative dating back to December 2009. A key part of the then Executive's 2010/11 Review of Spending Plans was a recognition that in some cases the delivery of savings requires upfront investment, as may be the case with energy efficiency interventions.

PSEC also coordinated the Central Energy Efficiency Fund (CEEF[24]). This was originally established in 1993, to provide financial assistance for energy and carbon saving measures that could not be financed through normal departmental budgets. During its lifetime, the CEEF supported 2,598 projects[25]. Over the 13 year period (1999-2012) the CEEF provided estimated funding of c.£32m for energy efficiency projects which achieved approximate energy savings of c. 6000 GWh and estimated total cost savings in the region of £50m over the lifetime of the funded projects.

Some individual departments were more proactive than others in embracing this. In Health for example,

[22] Sub-metering is the implementation of a system that allows the estate owner or landlord to record individually measured utility usage across multiple building, sites (or floors) where there is only one utility meter. This differs from utility metering in that the metering equipment and accuracy of it is the responsibility of the equipment owner not the utility network owner. It is therefore not used for billing purposes. This form of metering is often referred to as "behind the meter metering".

[23] In 2016/17 the AMU facilitated the development of a cross-departmental Guidance Note entitled, 'Guidance Note: Departmental Asset Management Plans (AMPs), A companion document written to support the recommendations contained in Managing Public Money Northern Ireland (MPMNI) Guidance'.

[24] Subsequently withdrawn in 2011

[25] www.niassembly.gov.uk/assembly-business/official-report/reports-13-14/10-march-2014/#AQO%205730/11-15

the Carbon Emissions Reduction Initiative (CERI)[26] was established in 2011 with the aim of refocusing energy efficiency and performance throughout the health sector to make cost savings that would be directed to frontline patient care. Between 2011 and 2013 there was £5.8m of recorded capital spend under the CERI Capital Stream against 46 projects.

CERI delivered annual recurring revenue savings of £1.3m, a reduction in energy consumption of 1.6% (12.5m kWhrs) and carbon savings of 2.4% (5,482 tonnes) with paybacks of less than 5 years. These paybacks offer a compelling investment case.

The case study overleaf sets out an example of interventions funded.

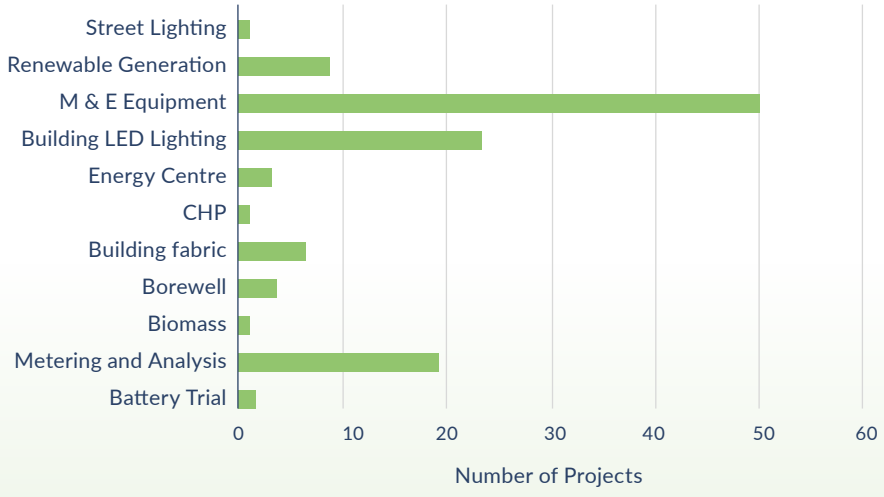
The Opportunity

There is significant opportunity to deliver a number of schemes. Many of these are the types of projects typically funded in industry delivering on fixed paybacks. Departments have already proposed 120 individual projects, covering 11 different technology types such as street-lighting upgrades, LED building lighting replacements, M & E equipment and building fabric interventions. These projects could form part of the £370m in capital investment required however, as with any investment, these need to be assessed in the context of policy delivery, value for money and affordability. Should they not satisfy these requirements, they are likely to be replaced with alternative energy reduction projects that meet the required criteria. These are all realistic technologies that are already being supported through private capital or debt funding in the private sector. The chart below lists the range of technologies already proposed.

Resources involved in the preparation of investment cases and for delivery of energy projects are limited and are scattered throughout Government. There is no way of knowing if, for example, an intervention in the schools estate is also planned for the health estate; nor is there any way to share information on project outcomes across the range of estates. This leads to inefficiencies in procurement and duplication.

Engagement with stakeholders and energy managers across the various estates indicated there has been limited investment in energy projects. Feedback suggests this is due to lack of budget availability, lack of targets and a low or no-risk tolerance policy. There is a general perception that innovation equates to more risk and more expense.

Figure 5: Proposed Energy Consumption Reduction Projects, by technology type



[26] The Carbon Emissions Reduction Initiative (CERI) was a capital stream established in 2011-12. This was established as a response to meet the Executive's PfG target of reducing GHG emissions in line with the UK Government's requirements for carbon emissions reductions under the 2008 Climate Change Act and the Carbon Reduction Commitment (CRC) in April 2010, which placed mandatory requirements on large energy consumers (including government departments) to pay for their carbon emissions through the purchase of carbon allowances.

CERI FUNDS LED LIGHTING ACROSS THE HEALTH ESTATE

LED Lighting technology has improved greatly in recent years and the Health Trusts utilised the CERI initiative to adopt this highly efficient technology into their estates to deliver immediate savings on both energy and carbon emissions.

Trusts are also reporting that the installations are proving very successful with staff and service users through enhanced lighting conditions within the work and service user environment and that there are reduced maintenance charges being realised due to the long life lamps.

LED lighting projects are currently providing savings of 954000kWh and 514 tonnes of CO_2 with recurring revenue savings of £140k.

The pictures show LED lighting installations at the reception in Daisy Hill Hospital, Newry and Pennybridge Area Stores, Ballymena.

Renewable Generation Potential

There is significant renewable electricity generation potential on the Government estate. The Government is the largest land owner in NI and there may be potential to cost effectively exploit this for mature renewables such as wind and solar as well as more emerging technologies such as storage, hydrogen etc. in due course. However, this potential resource does not offer short-term generation solutions in the context of this Energy Management Strategy and Action Plan.

The priority of this Strategy and Action Plan is to reduce energy consumption in the first instance. Renewable generation opportunities should only be pursued when work on eliminating waste and improving energy efficiency has been fully considered.

FACTOR: PROCUREMENT

With spend of circa £123 million, Government's annual energy bill means it is the largest buyer in NI, with a number of the largest individual accounts. It is likely there is limited scope to make substantial savings by tackling supplier margins alone.

Energy for heating, cooling and lighting (electricity, gas, oil etc.) is purchased almost exclusively by Centres of Procurement Expertise (CoPEs)[27] on behalf of NI Central Government[28]. The most active buyers are CPD, BSO and NI Water.

Findings

- The process for procurement deployed by the CoPEs is extremely robust in terms of how they buy. There are clear differences in terms of how CoPEs decide to award contracts, but this is largely dominated by price.
- Procurement processes are well structured and afford suppliers limited opportunity to add additional costs other than margin and balancing costs.
- There is little consistency with specifying renewable electricity.
- The buying strategies are different between CoPEs and across the various fuels bought. For electricity most are happy to accept the market price, whereas for other fuel types more choose fixed price contracts.
- There is limited evidence of active buying where clients ask CoPEs to buy flexibly responding to the market price. Where this does occur, buying decisions are made with limited access to information or specialist advice.

[27] Central Procurement Directorate: CPD buy for the Central Government estate including government offices, the education sector, justice and agriculture; Business Service Organisation: BSO buy energy for the health sector; and NI Water: buy energy for their own use.

[28] In some cases energy is a pass-through charge for rented facilities/buildings and PFIs.

Energy buying is split by fuel type (electricity, gas, biomass, LPG etc.) and often by sector/department. Each CoPE has different award criteria with price dominating all buyers.

- The majority of the CPD contracts are awarded based on price alone. Therefore all things being equal, the cheapest tender price is awarded the contract. There is generally no requirement for lower carbon energy sources/ renewables.
- BSO has a slightly different approach, where each Health Trust can choose to have up to 10% of the award criteria based on non-monetary issues linked to achieving better health outcomes. BSO requires all electricity to come from renewables.
- NI Water operates an active buying strategy dominated by price and requires (where economically advantageous) 30% of their electricity needs to come from renewables.

As well as buying energy as a service for heating, cooling and lighting, Government spends approximately £730 million/year of capital on new buildings and refurbishment. In terms of the Government estate as we have seen, only DEARA, DE, DoH, PSNI, NIW, DfI and DoF have set any sort of energy or carbon saving targets – and some of these have not been formally adopted or updated in many years. As a result there is generally no policy driver forcing action.

BUILDING PERFORMANCE STANDARDS AND MINIMUM REQUIREMENTS

Current minimum construction standards for new Government buildings and refurbishment have a minor impact on improving energy efficiency. For new builds or major refurbishments, Building Regulations[29] are a minimum requirement. However, these only apply to 'relevant' building work for 'new' and 'improved' assets.

Year on year, this represents only a small portion of the Government stock. While interventions in this area are important, they have limited impact without tackling the rest of the estate.

In addition to Building Regulations, the consideration (although not achievement) of BREEAM Excellent rating is mandatory for new buildings on the Government estate. As a result there is no *requirement* to include measures or control systems that would increase the energy efficiency and reduce the whole-life operating costs of buildings beyond Building Regulation requirements.

Issues such as departmental budget cuts, delays, new regulations etc. can all lead to pressure on project budgets and result in 'value engineering' throughout the building design process. It is important that those with the correct knowledge (often operational staff) and responsibility for managing the assets are involved early at design stage and remain involved throughout to advise on whole life cost consequences of energy efficiency opportunities being removed through design development and value engineering.

[29] Building Regulations do not: Set a fitness or performance standard for existing buildings to achieve; Require improvements to buildings where work is not being carried out; Require improvements to other parts of a building which would be otherwise unaffected by the building work (other than in a few limited circumstances); or Act as a driver to require work to improve the standards of the existing asset base.

Renovation and Nearly Zero Energy Buildings (NZEB)[30] are two of the main planks of EU policy for tackling energy efficiency and usage in buildings. Other regions of the UK and Ireland are already active in this policy space[31], NI is not. It is anticipated that these principles will remain after the UK withdraws from the European Union.

Aligned to the specification, the role of the business case is a key consideration in terms of realising operational cost savings from building and process design. The business case methodology is typically dominated by realising as low a capital build cost as possible.

As a result it is very difficult to isolate the whole-life benefits of marginal spend on energy efficiency measures for new buildings or refurbishments, as opposed to achieving lower capital costs bids (but that have higher whole life costs).

With this approach it is hard to justify, that marginally higher capital costs far outweigh lower capital costs but with much higher whole life costs.

SUMMARY

Across a number of areas Northern Ireland seems to be out of step with the rest of the UK and Ireland in how it approaches energy management in not only at the policy and strategy level, but also in its approach to the funding of opportunities to improve energy efficiency.

Adopting some of the aspects of energy management that other jurisdictions currently deploy presents a significant opportunity for NI to drive the required change that is necessary to more quickly see the benefits of energy efficiency deployment. This is particularly important in managing the potential risk of rising energy prices.

[30] Changes to the EU EPBD (2018/844/EU) that came into force in July 2018 (Member States have until March 2020 to transpose into national law) are aimed at accelerating the cost-effective renovation of existing buildings. In addition the "Near Zero Energy Buildings" (NZEB) mandate of the EPBD requires that all new buildings are to be nearly zero-energy by the end of 2020 (all new public buildings must achieve this by the end of 2018). The UK as a Member State is achieving compliance with the requirements of the Directive through a cost-optimal approach in the Building Regulations.

[31] ROI has recently published its long-term building renovation strategy 2017-20 , which demonstrates a clear and ongoing process of strategic planning and implementation led by the Department of Communications, Climate Action & Environment (DCCAE). This, along with the ROI Public Sector Energy Efficiency Strategy, provides a framework to bring forward capital investment of medium to deep retrofit energy efficiency and renovation projects in the public sector.

MANAGEMENT PROPOSALS

Building on the baseline findings, this section recommends ways to improve energy management across a range of areas, as set out below. Each area is considered in turn, with proposed actions and associated benefits. The following section presents the management proposals in relation to:

1. Policy, Governance and Management

2. Reporting and Monitoring.

POLICY, GOVERNANCE AND MANAGEMENT

The baseline study confirmed the following:

- Northern Ireland's approach is out of step with other jurisdictions
- policy responsibility is split across four organisations
- no energy reduction target for Government
- no energy efficiency strategy for Government
- no centralised monitoring and reporting of energy management
- no access to centralised, flexible energy expertise to assist Government in delivering energy savings across the entire estate
- no plans to build energy skills capacity and capability in Government
- limited knowledge sharing and pooling of resources.

There is a clear opportunity for Government to show leadership in regard to use of energy. This means in the first instance one Department taking ownership of this Energy Management Strategy and driving its implementation across the whole of Government.

The opportunity is to consider where such overall responsibility and accountability for energy management in Government should rest. Continuing with the status quo is not an option, as it will sustain the fragmentation that already exists and will make the delivery of the targeted energy savings much more difficult.

In addition, consideration needs to be given to more closely aligning all energy efficiency related activities within an overarching energy policy context.

It is suggested that DoF or DfE would be best placed to take on the single ownership for implementation of the EMS for Government.

For DoF

- This would mean taking on a more proactive role than it currently does and extending its reach and advisory service beyond the office estate to include justice, education, water, health and other large estates.
- While operational responsibility would remain with the Departments concerned, DoF would need to take on a more visible driving and reporting role than it currently does and this may require additional resources.

For DfE

- This would entail taking on some of the responsibilities that DoF currently has regarding promotion of energy efficiency to public bodies.
- DoF would remain operationally responsible for promoting energy efficiency in the office estate, but DfE would perform an oversight and reporting function that is not currently carried out by any Department in Government, and would be responsible for reporting annually to the NICS Board and the Executive.
- Crucially, however, DfE would take on responsibility for ensuring a consistency in promotion across all sectors of Government and that the promotion is proactive, engaged and supportive where necessary. This may require resourcing support in terms of monitoring energy consumption across central Government.

In order to mirror the Scottish and Welsh models, it is necessary to develop an approach that centralises Government energy management policy responsibility in a single Department (and eventually makes it a statutory duty). This would also have the flexibility to access energy management expertise and funding as required to speed up delivery of agreed energy saving projects.

One of the issues with having DoF in a responsibility role is that despite it having statutory duties in respect of energy efficiency in the public sector, it primarily covers the office estate, which only accounts for less than 1% of the total energy consumption across NI central Government. Moving responsibility to DfE (who have responsibility for wider energy policy) may perhaps be a more natural host.

RECOMMENDED ACTIONS AND BENEFITS

In Scotland and Wales energy efficiency is embedded in wider regional energy policy documents such as the Scottish Energy Strategy and the Energy Efficiency Strategy for Wales. Ireland has a dedicated policy document to address energy management in the public sector as well as a dedicated delivery body Sustainable Energy Authority of Ireland (SEAI) to undertake much of the monitoring, reporting and measurement functions associated with the rollout of a successful energy management strategy.

It is not suggested that implementation of all energy efficiency activities moves to a single Department, as this would not be practical. However, it would be for the Department nominated to take the single responsibility for implementation to ensure that energy management activities at operational level were progressing satisfactorily.

Evaluation

In terms of the EMS, ongoing evaluation is as significant as development, as it allows for an assessment of efficiency and effectiveness in achieving the desired results after a set period of time.

It is therefore proposed that a mid-term review of the EMS is completed by the end of 2024/25 so that progress against the 30% energy consumption reduction target can be measured and published. The mid-term review point is also a useful checkpoint to reflect on the progress towards achieving the Strategy's objectives and to enable the decisions for the remaining strategic period to be recalibrated or adjusted, if required. It is envisaged that the 30% energy consumption reduction target would be subject to an upward only review at that point.

Not only will a mid-term evaluation allow Government to learn internally, it will also allow the mid-term position to be independently presented externally to a broader public audience to demonstrate Government's commitment to being an energy management and energy efficiency exemplar.

In addition, it is proposed that a post project evaluation is completed post 2030.

The table below sets out the key recommendation and associated actions. All of the actions have been categorised as either Optimise, Small Change or Step Change. The purpose of this categorisation[32] is to highlight the magnitude of the actions required and indicate the authority required to carry out the actions.

Recommendation 1		**Ensure that ownership for strategic energy management across the estate is aligned with wider energy policy responsibilities**			
Optimise Actions [32]		**Small Change Actions**		**Step Change Actions**	
1.1	By the end of 2018/19 DfE and DoF should agree arrangements for the ownership and oversight of energy management in Government.	**1.3**	In 2019/20 commence an energy behavioural change campaign across NI Central Government.	**1.4**	Legislate for mandatory responsibility if necessary and when appropriate.
Action Owner	DfE & DoF	**Action Owner**	DfE & EMU	**Action Owner**	DfE
1.2	By the end of 2024/25 undertake a midterm review of this strategy.				
Action Owner	DfE				
BENEFITS					

1. **Agreeing arrangements for ownership and oversight of energy management in Government will:**
   - create a central focus for energy efficiency activities
   - allow for energy management policy gaps to be addressed
   - drive a co-ordinated implementation of the recommendations of the Energy Management Strategy for NI Central Government.
2. **Reviewing the Strategy midterm will allow:**
   - progress against targets to be measured
   - a review of actions and targets needed for the remaining five years of the Strategy period.
3. **Commencing an energy management behavioural campaign across NI Central Government:**
   - realise additional energy savings from low or no-cost measures
   - increase promotion of energy-saving behaviours across NI Central Government.
4. **Bringing forward legislation, if necessary in the longer term, will formalise the statutory position in relation to energy efficiency in NI Central Government.**

[32] Actions that have been categorised as optimise or small change are generally thought to fall within the remit of the action owner and would require only normal authorisation by senior management and Permanent Secretaries within Departments. Step change actions are actions that would need to be authorised by a Minister.

TARGET SETTING

The 30% energy consumption reduction target was set to ensure that Government does not pay more for energy in 2030 than it does today in real terms.

Overview

- While 2030 is the end date, progress against this target will be assessed annually taking into account interventions completed in the previous year with interim progress adjusted accordingly.
- The richness of the data means that disaggregation is possible to prioritise poorly performing buildings and high energy users by building type and use.
- The comprehensive analysis supports the opportunity for NI to achieve year on year improvements in energy efficiency across the entire Government estate, in a focused way which delivers the most cost effective measures to save energy.
- The collected data has highlighted the significant diversity across building use groups.

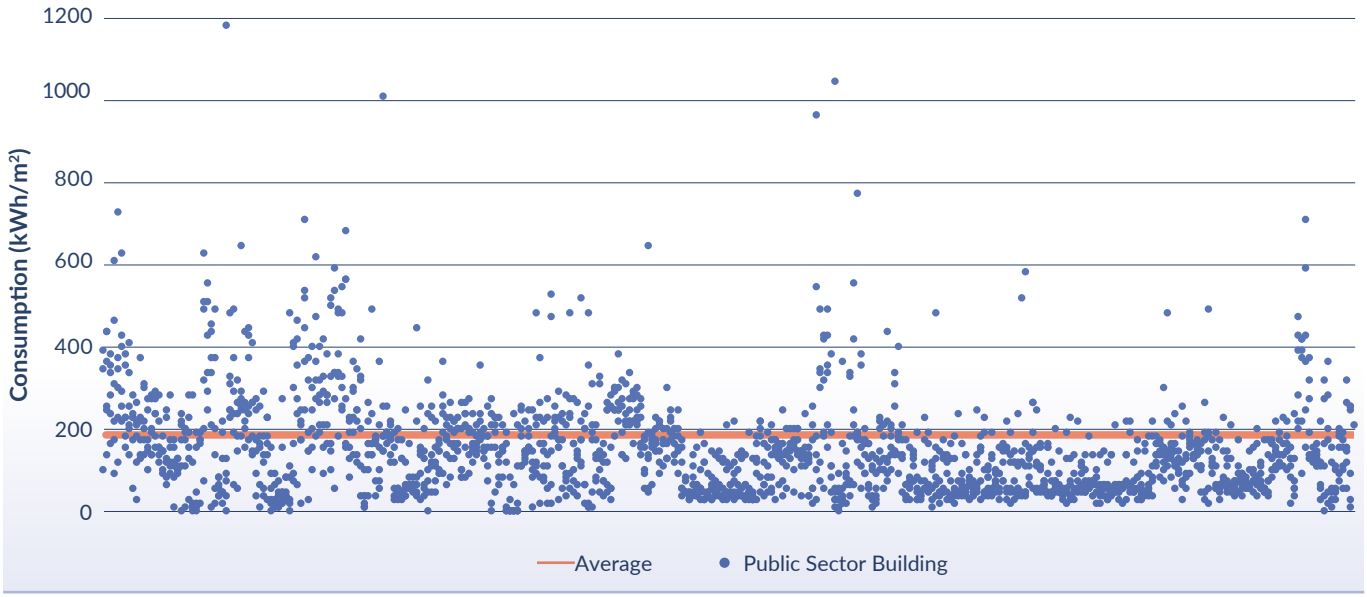
Methodology

The target setting methodology considered three approaches.

1. **Setting a target based on a common energy intensity indicator in kWh/m² across NI Central Government.**

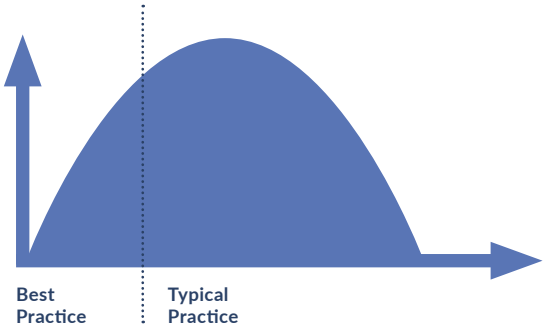
   This method involved selecting an average energy consumption/m² for the data range collected and imposing a 30% reduction target in kWh/m². All Departments would need to move their average energy consumption to a common position regardless of building use. This approach was quickly discounted since it was not making comparisons on a like-for-like basis based on building use and could easily lead to incorrect conclusions in relation to Departmental energy use.

Graph showing the variability of NI Public Sector buildings energy consumption intensity



2. **Setting a target based on a fixed percentile approach by building type.**

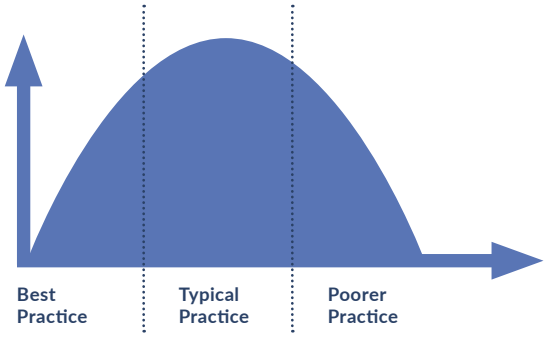
   This method assumes that best practice energy use is considered as energy use less than the 25th percentile, with typical practice energy use being anything greater than the 25th percentile. The goal of this approach is to move those organisations that are currently exhibiting typical practice to move towards the best practice region. The diagram below sets out the principle:



While this approach is an improvement on the previous approach of simply setting a global reduction in energy consumption/m^2, it is rigid and doesn't allow for targeting across the distribution. The buildings to the right of the line are all treated in same, regardless of their location in the distribution.

3. **Setting a target based on the mean for each building use type using targeting and forecasting.**

   This methodology accounts for the variability in building use type by setting dynamic targets according to the mean for each building use type e.g. schools are compared to other schools only etc. This allows poor practice, typical practice and best practice for each building use group to be identified and compared within their group. The diagram below sets out the approach taken:



Dynamic target aggression

Using this methodology allows a targeted intervention list to be developed and prioritised from poorest performing to best performing by building use type. Over time the average energy performance should improve as more buildings move towards and beyond typical and best practice for buildings of that use type.

Integral to this methodology is the use of annual reviews of progress against the 2030 target. Interventions are likely to happen in an irregular non-linear fashion – this method allows for these to be simulated over the intervention period. The method allows for improvements to be seen at a building use level and has the advantage of being disaggregated by individual building, which may be used for Departmental budget planning in the longer term.

The target-setting methodology is different from other regions of the UK and Ireland in that the data analysis has authenticated the target to ensure that it is both valid and deliverable.

The data analysis methodology has been designed to move to data-driven strategies and away from more traditional fixed percentage approaches to data modelling. It has focused on setting realistic and tailored targets (which can be set at individual building level) and since progress against these is to be reviewed annually (at an overall level) the extent of interventions required to achieve targets will be carefully monitored and updated as appropriate.

The variability across the range of data collected, when examined as a kWh/m^2 measure at building level, is significant – meaning that it is imperative to find factors to explain this variance.

Further statistical analysis showed that energy consumption by building use type explained a significant proportion of the variability in the data and would be a vital factor in target setting. For example, hospitals on average consume 368 kWh/m^2 and schools 115 kWh/m^2. Clearly the use/function of a building has a critical influence on its energy consumption. Separating building function and building fabric is an important part of smart target setting.

It is planned for modelling outputs to include a user interface tool that could allow users to view, compare and contrast historical and current data in real time. This interface could be made accessible so that building users and other stakeholders are able to query energy use by Government.

Such a transparent, publicly accessible publication of data is standard practice across other areas of Government such as the Greenhouse Gas Emissions Inventory and in other jurisdictions.

Publication of energy consumption data in this manner would transparently demonstrate leadership in strategic energy management in Government as well as showcasing Government as an exemplar to other energy using sectors in NI.

Recommendation 2	**Adopt a net energy consumption reduction target of 30% by 2030**			
Optimise Actions	**Small Change Actions**		**Step Change Actions**	
	2.1	By the end of 2018/19 agree to implement an energy consumption reduction target of 30% by 2030 against a 2016/17 baseline of 1867 GWh, reviewed annually.	**2.2**	Introduce legislation for a mandatory energy consumption reduction target if necessary and when appropriate.
	Action Owner	NICS Board	**Action Owner**	DfE
BENEFITS				
1. **Agreeing a 30% energy reduction consumption target will drive forward action and investment in energy efficiency across Government and the dynamic nature of the target means that annual reviews of the target are required.** 2. **Bringing forward legislation if necessary for a target would make energy consumption reduction mandatory for NI Central Government.**				

EXPERTISE

A requirement to access periodic energy expertise was an issue frequently raised by stakeholders during the development of this Strategy. This ranged from a need for expertise to assist with project appraisal, business cases or technical understanding to simply having a resource to undertake data collation, monitoring and reporting. Common to all was a need to draw on energy expertise and advice in a flexible and timely fashion.

In other jurisdictions, this broadly equates to the type of services offered by either government funded bodies such as Scottish Futures Trust[33] and Sustainable Energy Authority of Ireland[34] or private sector appointed consultants. There are a number of energy advisory bodies in NI such as Bryson Energy[35] and the Energy Saving Trust[36], but they focus on providing advice and administering grants for the domestic energy sector.

Resources, dedicated skills and experience in energy management across the public and private sectors in NI are scarce. Where dedicated energy resources do exist in NI Government, they tend to work with other Facilities Management (FM) and operations staff from within their area or department, and are not typically at a strategic level.

As a result there is little sharing of knowledge or learning between energy managers and therefore between government departments. This applies to procurement of electricity and gas, the procurement of new capital projects/refurbishments, specifications, management practices and reporting. Similar to the general disaggregation of responsibilities between departments at a policy level, the same is true of identifying, developing and making investment decisions for energy management programmes and projects.

RECOMMENDED ACTIONS AND BENEFITS

1. Establishing an Energy Management Unit

Bringing this expertise together creates an opportunity to develop synergies, share knowledge and develop relationships. If, existing resources were initially redirected to work together, this could form the genesis of a standalone Energy Management Unit (EMU) that could focus on implementation of this Energy Management Strategy.

This unit could offer a range of energy management support services for Government to ensure that energy reduction opportunities are maximised.

It is recommended that a dedicated EMU is established to support the delivery of the Energy Management Strategy for NI Central Government. Here are a number of options that were considered for the creation of such a body:

Option	Advantages	Disadvantages
1. Set up a standalone branch within the nominated single Department.	Would streamline responsibility into one Department.	Could take time to set up and resource.
2. Expand the remit of DoF Properties Division Engineering and Energy Branch.	Could build on existing expertise.	DoF would need to secure additional specialist resource, which could be time-consuming.
3. Create a separate unit outside of the Departments that is sponsored by the nominated single Department.	Could be set up quickly with access to a range of experts across a number of areas.	May not be fully utilised by Departments without NICS senior management mandate.

[33] www.scottishfuturestrust.org.uk

[34] www.seai.ie

[35] www.brysonenergy.org

[36] www.energysavingtrust.org.uk/home-energy-efficiency/northernireland

Such a unit could be initially resourced by SIB, in effect carrying out the implementation of this Energy Management Strategy and Action Plan across Government.

In the first two years the unit would generate impact and add value by:

- identifying the potential for low and no-cost energy projects
- working with relevant bodies to establish an 'invest to save fund'
- developing a pipeline of capital energy saving projects
- completing a review of energy buying strategies
- scoping the extent of automatic metering required
- collating and reporting energy consumption
- integrating operational and facilities management staff earlier in the design stage of projects.

Based on the potential savings identified in this Strategy, it is possible that such a unit may in the future, have the potential to be either fully or partly funded through a recurring revenue stream generated from savings made following a two-year set-up phase. It is therefore envisaged that for the first two years the EMU would need Departmental sponsorship. This could include the provision of some resources from within Government, if available.

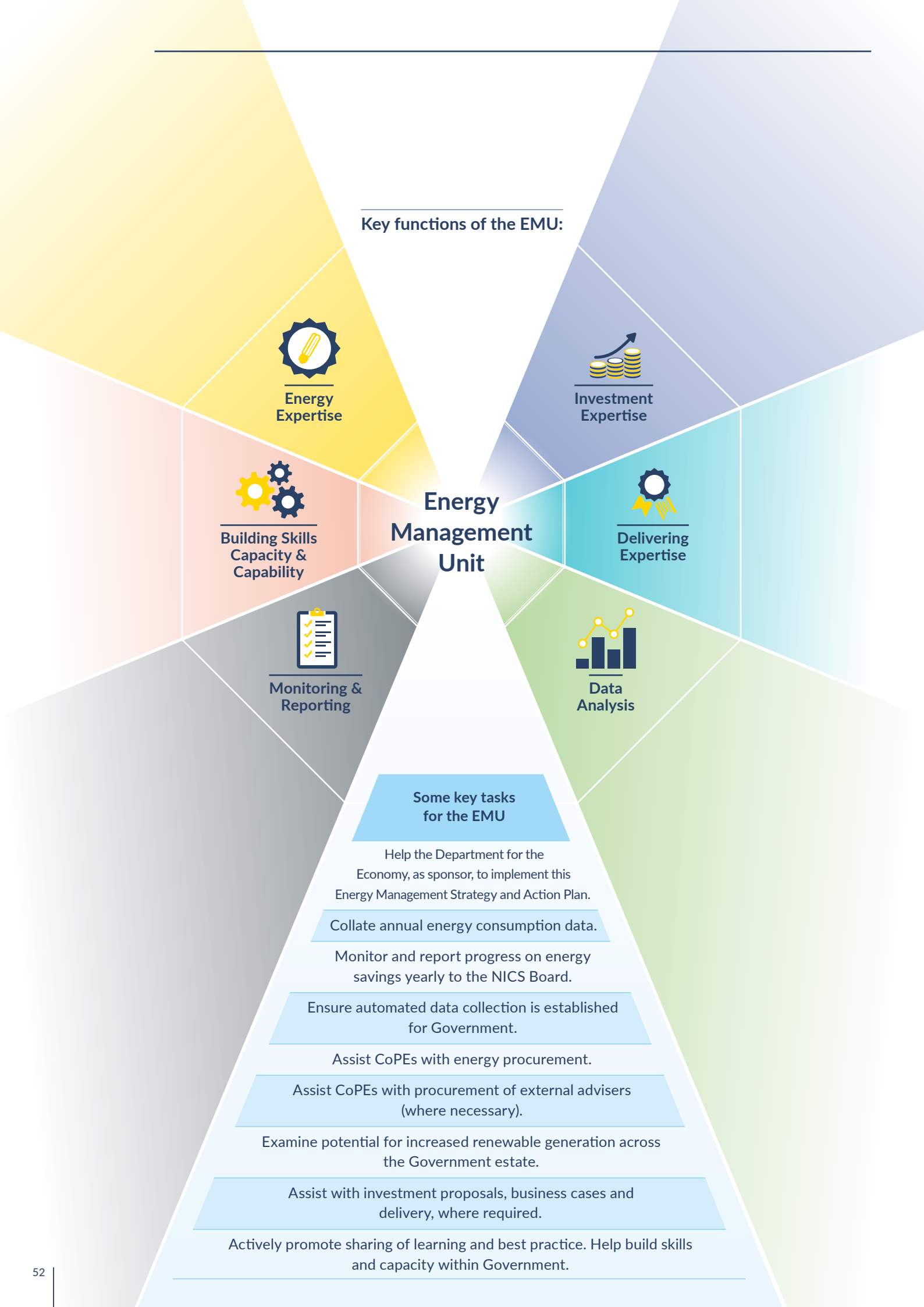
The EMU would consist of two existing resources from within SIB and possibly up to three other resources covering technical, data and procurement from within Government. It could also avail of the existing commercial, financial and asset management expertise within the Asset Management Unit in SIB.

It is estimated that this would have an annual staff cost in the region of £500,000. An Operating Partnership Agreement (OPA) setting out resourcing and funding arrangements would formalise such an approach.

In advance of 'invest to save' funding being agreed, bids for small energy saving interventions should be made from within existing Departmental baseline budgets. However, this is a short term measure and an 'invest to save' fund will be a vital mechanism to unlock energy savings at scale over the coming years.

Initially the key roles and responsibilities of such a unit would emanate from the need to implement the recommendations of this Energy Management Strategy. It is envisaged that the EMU would be flexible and hence would offer a menu of agile services that Departments could select all or part of, as required, rather than a range of fixed services.

Key functions of the EMU:



Some key tasks for the EMU

Help the Department for the Economy, as sponsor, to implement this Energy Management Strategy and Action Plan.

Collate annual energy consumption data.

Monitor and report progress on energy savings yearly to the NICS Board.

Ensure automated data collection is established for Government.

Assist CoPEs with energy procurement.

Assist CoPEs with procurement of external advisers (where necessary).

Examine potential for increased renewable generation across the Government estate.

Assist with investment proposals, business cases and delivery, where required.

Actively promote sharing of learning and best practice. Help build skills and capacity within Government.

In addition, the EMU would provide support to Departments in order to:

- identify low and no cost measures
- deliver energy consumption reduction interventions
- align energy management and asset management initiatives through their departmental AMP
- implement behavioural campaigns as required
- set building performance standards
- develop investment pipeline proposals.

2. REGISTERING EXPERTISE

Building capacity and in-house skills in energy in the longer term is a challenge. The transient nature of staff movements in the Civil Service leads to a lack of subject matter experts embedded in Departments, and makes it difficult to retain knowledge and skills over the longer term.

A central register of staff with energy skills, similar to the central register that exists for qualified accountants, may be useful to identify where skills rest in Government as an initial step.

Disseminating best practice and sharing successes has long been proven as an effective means of encouraging improvement through an ongoing lessons learned process.

A dedicated and focused programme of promotion of successful projects combined with a sustained behavioural campaign definitely has an important part to play in encouraging more energy efficiency and retrofit activity in Government.

Similarly, the delivery of projects allows for derived learning from the demonstrator effect and the outcomes of such projects can further help to promote wider implementation in the public sector.

Recommendation 3		Establish an Energy Management Unit (EMU) to help Departments develop potential energy-saving opportunities and maximise energy efficiency skills and measures across Government	
Optimise Actions		**Small Change Actions**	
3.1	Continue the established Energy Management Forum for information sharing, collaborative working and skills/ capacity building to sustain momentum for energy efficiency.	**3.2**	By the end of 2018/19 DfE and DoF to agree with SIB the roles, responsibilities and resourcing of an EMU.
Action Owner	EMU	**Action Owner**	DfE & DoF
		3.3	By the end of 2019/20 an EMU will establish project support requirements with Departments, and work with stakeholders to bring forward immediate behavioural change, through low and no-cost measures, where possible.
		Action Owner	EMU

BENEFITS

1. **Setting up an EMU will assist with implementation of the EMS, with monitoring and reporting against targets and will make available flexible energy expertise for Departments as required. It will also provide opportunities for Departmental staff to build capability and skills.**
2. **Continuing with the Energy Management Forum will ensure dissemination of best practice and will effectively create an in-house energy network.**

REPORTING AND MONITORING

The baseline study confirmed a number of key findings.

- The sole statutory reporting of energy consumption for the Government estate is through the Carbon Reduction Commitment (CRC) scheme, which is to be abolished in 2019.
- Up-to-date energy consumption reporting is generally not completed or available.
- Data collection systems and capabilities vary widely.
- Only 10% of buildings have the systems and meters to send energy consumption information automatically to estate teams.
- Sub-metering isn't commonplace on large estates.
- Limited resources and data analytics capabilities hamper informed decision-making.
- Monitoring and methodologies used are inconsistent.
- Asset Management Plans have now become a recognised means of informing Departmental Boards on asset performance and should be used to record energy performance, as recommended in the AMP guidance note.

RELEVANT CHALLENGES AND OPPORTUNITIES

1. Mandatory Public Sector Reporting

Other than collection and reporting of energy data by eligible Government organisations through the CRC (which comes to an end in March 2019) and some limited energy information reported through the AMPs, there is currently no substantial energy consumption reporting function across Government.

There is a significant opportunity to improve reporting, and it will be important to ensure that energy information provided for the AMPs is co-ordinated with asset management planning proposals both at departmental level and across wider Government. The Asset Management Unit (AMU) working with EMU could assist Departments in this regard.

The lack of public sector targets at a macro level appears to have contributed to this limited energy reporting. Reporting needs to be mandatory but must also be relevant and easy for staff.

In order for this to be less resource-intensive there is an opportunity to roll out metering and communications capabilities as well as the systems to receive and interrogate energy data to facilitate reporting.

In the context of a target for energy consumption reduction, a reporting function is an essential requirement to see how progress is being monitored and to track this.

2. Dedicated Resources

Despite the need for an improved mandate and purpose, inevitably there is a need for dedicated resources in the short term. However, automatic metering should reduce this burden in time. In the course of the 2016-17 data collection exercise, SIB engaged with staff who had limited time to collect energy data, let alone do anything with this in the context of reporting.

Often these were Facilities Management staff for whom energy was a small portion of their remit, if at all. In a number of cases consumption and cost data were provided by finance staff.

The inevitable consequence of spreading resources too thin, and not having people with the correct skill set, is poor or incomplete data and poor reporting. When there are dedicated teams and metering in place, as at Belfast Health Trust, PSNI and the managed office estate, it should be noted that the quality and accuracy of data and reporting capabilities were markedly better and more easily accessible.

DATA COLLECTION AND ANALYSIS

The collection, analysis and use of data comprise one of the most critical parts of this Strategy. Data is the enabler of informed decision-making in energy management and procurement. In order to manage, one must first measure.

The general lack of robust and verifiable energy data in the Government estate makes this difficult. It appears data is aggregated at too high a level, making it virtually impossible to assess the benefits of energy interventions at the level where these take place, namely, at individual building level.

This, together with the very manual and time-consuming way that energy data is generally collected, is not conducive to good energy management or facilitating co-operation from estates teams.

The fact that the 2016-17 energy data was collected manually via spreadsheets led to a number of challenges symptomatic of energy data in the Government estate.

- **Staffing**

  Many organisations simply don't have staff or systems that allow them to collect this information easily. For example, in the schools estate, which covers over 1,758 institutions, there are just two Energy and Environment Officers covering all energy matters (in addition to other tasks). While 72% of schools have automatic electricity meters, which don't need to be manually read, only 1.8% (32 meters) are configured to automatically send consumption data back to the Education Authority.

- **Systems**

  The systems to record energy information are typically basic, with spreadsheets being the 'norm' and in many instances the information requested had to be recovered from hard-copy bills.

  Cases of central databases were very much the exception. For example, in the education sector their Manhattan property management tool has a function to record energy data usage but it is not currently being used. Also, how energy is recorded for accounting purposes varies widely across organisations, making it difficult to extract financial information relating to energy.

- **Data Integrity**

  The 2016-17 data returns contained a number of errors, some trivial but some significant. Extensive verification and validation was required. The accuracy of these inputs is relevant when you come to target setting and validating future interventions.

  Good energy data coupled with robust estates condition information (which is also sparse) would allow for better design, smarter acquisitions and more efficient use of energy.

- **Timeliness**

  The timeliness of data availability hinders progress. It took six months to collect and validate the 2016-17 data. In many cases consumption and financial reconciliations for 2016-17 were simply not available, despite accounts being signed off.

- **Naming and Measurement Conventions**

  There is an opportunity to improve the current inconsistent approach to naming and measurement conventions in both existing and new datasets. For example, there was variation in floor area formats with some using Gross Internal Area (GIA) and others using Net Internal Area (NIA).

Sub-metering

Given the size of some of the estates and age of some of the buildings, it is not possible to have multiple modern 'Interval Meters' everywhere. In these scenarios it would be good practice to have adequate sub-metering. In many cases there is limited sub-metering on large estates.

For example, the Ulster Folk and Transport Museum at Cultra owned by National Museums Northern Ireland (NMNI) has no sub-metering on a site comprising 44 buildings/facilities. As a result, it is almost impossible to disaggregate savings from energy efficiency measures throughout the estate from overall reduction in usage for other reasons such as weather variations. This makes justifying and validating savings from energy efficiency interventions much more difficult. There is a significant opportunity to install sub-metering along with proper primary metering. This facilitates good decision making and hence cost and energy savings.

RECOMMENDED ACTIONS AND BENEFITS

1. **Improved data collection**

   Data collection and analysis is a key component to unlocking resource budget savings (RDEL). Whilst DoF ceased collecting data in 2013/14, it is vitally important that this must recommence and continue on an annual basis. The importance of understanding the energy use of each building, organisation and estate is fundamental in order to make sure that investment decisions and organisational changes are:

   - undertaken based on sound data
   - tailored to meet the needs of the organisation
   - targeted to deliver the greatest savings.

2. **Better metering**
   - Notwithstanding the need for reporting, this needs to be made easier and made more robust. More automatic metering and analytics capabilities will inevitably reduce the need for manual interventions, saving resources and increasing accuracy. This will be a key factor in a business case to consider value for money for automatic metering and analytics.
   - Many of the issues present in Government would be eliminated or negated by modern metering – with appropriate communications capabilities allowing organisations access to the same consumption information that suppliers use for billing purposes in near real-time.

- In many cases simple retrofits to existing meters – together with supporting staff and systems – would be sufficient. Given that the meters are owned by regulated network companies, this ensures data integrity and therefore information accuracy. This is why it is proposed that every building or facility above the de minimis level (250m^2) will have (subject to business case approval and funding) an Interval Meter automatically collecting usage data with communications capabilities to allow for near real-time data collection by the estate management teams.
- While it is recognised that new hardware and software solutions, in the form of metering and communications, needs to be put in place to collect and transmit energy data, a system for 'reporting' energy usage is just as essential. In order for this to be effective, annual data collection needs to be centrally co-ordinated and mandatory for all public bodies.
- Having established 2016-17 as a benchmark it is therefore critical to continue to collect and report energy consumption information each year going forward for every building in the Government estate. This task could be co-ordinated by the Energy Management Unit, who will manage the collation, verification and reporting of energy data at a senior level. This was historically done by DoF but hasn't happened in a number of years, and there are no plans to recommence this task within DoF.

Recommendation 4	Mandate annual reporting of energy consumption against a 30% reduction target to the NICS Board and/or the NI Executive		
Optimise Actions		**Small Change Actions**	
4.1	From 1 April 2019 Government bodies will be responsible for collecting energy consumption data annually at building/facility level, including across all their ALBs to improve and sustain monitoring, targeting and reporting across Government, and should utilise existing departmental Asset Management Plans to present key energy data and ensure alignment with operational investment initiatives.	**4.3**	The EMU will produce an Annual Energy Report to provide the NICS Board and/or the Executive with a means of tracking progress and assessing performance.
Action Owner	Each department	**Action Owner**	EMU
4.2	In 2019/20 the EMU will scope and develop a business case for the roll-out of automatic metering and analytics capabilities initially across the high energy users in the NI Central Government Estate.	**4.4**	Prior to the closure of the CRC in 2019, DfE and DAERA should agree arrangements to co-ordinate and publish the annual collection of all NI Central Government large users' energy data, including mandatory emissions recording and reporting, in the same way DfE plans to do for the private sector.
Action Owner	EMU	**Action Owner**	DfE & DAERA

Recommendation 4

BENEFITS

1. **Collecting energy data annually will allow better reporting, better tracking and validation of targets and annual tracking against the 2016-17 benchmark. It will also enable progress to be reported and action taken at departmental level.**
2. **Developing a business case for a roll-out of automatic metering will in the longer term:**
   - allow access to validated information
   - make reporting easier and more resource-efficient
   - deliver much greater coverage
   - assist with near real-time decision-making and interventions
   - assist procurement competitions by having daily profiles.
3. **Centralised collation of data will allow access to validated information and inform wider policy-making, target-setting and tracking.**
4. **Developing a public sector reporting system when CRC ends will assist NI with its wider reporting requirements and demonstrate Government leadership and accountability in reducing carbon emissions.**

COST REDUCTION PROPOSALS

This section recommends ways to reduce energy costs across a range of areas. Each area is considered in turn, with proposed actions and associated benefits. The following section presents the cost reduction proposals in relation to three areas.

1. **Interventions to reduce costs**
2. **Procurement**
3. **Building Performance Standards and minimum requirements.**

1. INTERVENTIONS TO REDUCE COSTS

The baseline study confirmed the following:

- There has not been a co-ordinated, cross-departmental energy capital programme since PSEC ended in 2013-14. This contrasts dramatically with our regional neighbours.
- There are no clear Invest to Save investment criteria.
- Resources involved in the preparation of investment cases and for delivery of energy projects are limited and fragmented throughout Government.
- There has been limited investment in innovative deployment of energy generation/production technologies due to a poor strategic framework, absence of targets and a low/no-risk tolerance.

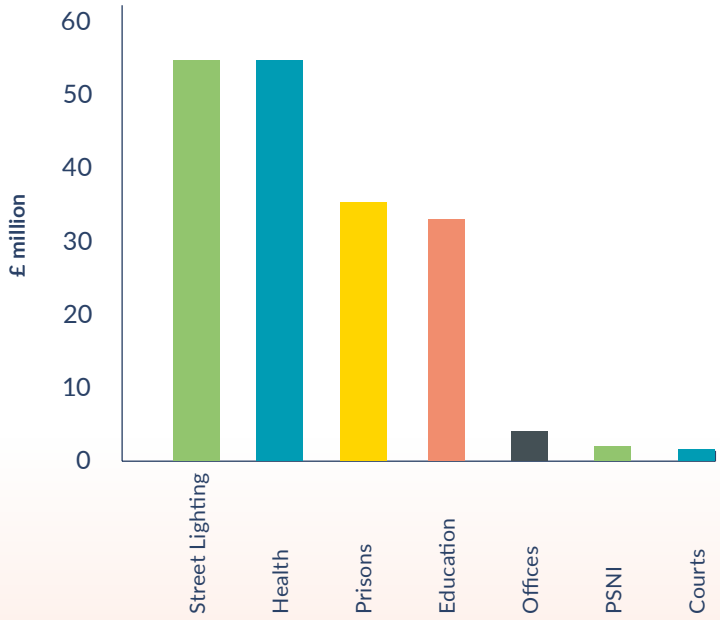
Throughout stakeholder engagement supporting the development of this Strategy, the lack of funds and a strategic commitment to funding energy projects came up frequently. Stakeholders have pointed to the historic CEEF (and in Health the CERI Programme), where centralised and ring-fenced funds were available.

These funds were successful at enabling interventions and making revenue savings that are still being realised today and will continue into the future. Capital investment in energy projects is a good way of achieving revenue savings with evidence of paybacks in the order of 5-8 years, from earlier investments by Government.

In order to give confidence that a sufficient pipeline exists an initial list of potential projects with an estimated value of c. £170m has been developed as part of this Strategy (Figure 6 below). This is based on schemes nominated by Departments based on their current energy reduction plans insofar as they exist. These projects (if acceptable in investment terms) would form part of the £370m required.

Clearly, if capital was available, a number of these schemes could move ahead (subject to business case approval) delivering long-term recurring revenue and emissions savings. However, ensuring these investments are made in a strategic way is an important and essential part of this strategy and is critical to cost effective achievement of the proposed 30% reduction target by 2030.

Figure 6: Initial Pipeline of Capital Projects



The case study below demonstrates a typical intervention in the education sector.

CASE STUDY – SWITCHING TO NATURAL GAS BOILERS ON THE EDUCATION ESTATE

This project included the replacement of oil boilers with natural gas boilers at eight schools across the education estate. The total cost of the project was c. £98,000 with a simple payback of 3.8 years.

The project resulted in:

- 13.8% energy saving
- cost saving of £21,650
- CO_2 savings of 362 tonnes / year.

The significant renewable electricity generation potential on the public forest estate is not included in the previous graph, as the lack of electrical grid connections – a prerequisite for developing wind farms on forest estate – is not achievable in the short term. This potential should be explored further when grid connection policy conditions allow.

Evidence provided by stakeholders has suggested that it has been difficult for energy managers to make any business cases for capital spend on energy projects given the lack of strategic direction in energy management. Many recent initiatives taken have therefore been as a result of bidding for capital in accordance with the normal annual budgeting and monitoring round arrangements e.g. investment made to upgrade street-lighting with more efficient light emitting diode (LED) street-lighting columns. Whilst worthy in their own right, these types of interventions are not strategic in the way described above.

Since there are no central capital funds or centralised resources to assist in the preparation of energy investment cases, initiatives that have taken place have typically been quite small, disaggregated, and/or based on in-year capex budget slippage. There is little evidence of departments allocating specific capital budget sums to support energy interventions. It is interesting to note that the Scottish Government provide funding to support the development of business cases which are delivered by an external Project Development Unit. These projects are then delivered through an energy efficiency contract framework where the private sector do not share the savings but do guarantee them. Public bodies in Scotland have opted to pay for these works upfront utilising capital.

As a result of the approach above, there is no co-ordination of investment opportunities, nor has a central pipeline of opportunities been developed. Without a pipeline it is hard to make a robust case for a centralised fund; and without a fund it is hard to see the point in developing a pipeline. The result is the status quo, where energy managers and estates staff carry out their own research and make their own investment cases in isolation from others.

The process of data collection at building level in this Strategy ensures that target setting and focus for attention and intervention is based on strong evidence. It allows for investments to be targeted in order to deliver maximum savings. The table below (based on the 2016/17 data) illustrates how targeting interventions at large users operating above the mean average consumption in a range of grouped sectors would achieve savings in a targeted and transparent way. Moving all users to the mean consumption (and better) for their building type is a fundamental part of the methodology underpinning the 30% net energy reduction target.

By grouping building use classes into a number of sectors, we can see it is easily possible to identify the numbers of poor performers relative to the mean and to calculate what level of energy savings would be made if these were performing at the mean level. The table below summarises the analysis for the health and education sectors.

Annual Consumption By Asset Category	Hospitals	Schools and colleges	Others	Total
Total Number of Buildings	28	1074	35	
Consumption (GWh)	550	398	917	1865
Average Consumption (kWh/m²)	478	119	180	
Number of above average consumption Assets	11	438	126	
Consumption (GWh) if above average assets were capable of performing at the category average	480	310	889	1679
% Reduction Contribution	4%	5%	1%	10%

While all positive, the table on the previous page shows targeted interventions are more efficient – that is, interventions at 11 hospitals would have a greater energy saving impact than interventions at 438 education facilities. This should inform priorities going forward.

The objective of this Strategy is to move all buildings closer to the mean (and beyond) in order to meet the 30% net reduction target. The modelling indicates however that only prioritising and targeting poor performing buildings may lead to sub optimal outcomes and failure to meet the 30% target.

Recommendation 5	Create a pipeline of energy reduction projects
Optimise Actions	
5.1	During 2019/20 the EMU will undertake co-ordination of the development of energy investment opportunities across Government and produce information of a quality suitable for business case preparation to inform future budget planning.
Action Owner	EMU & relevant Departments
BENEFITS	
1. Establishing a pipeline of projects will have the benefits of being investment ready and will allow for budget planning and predicting outcomes relative to targets.	

There is no established Invest to Save payback criterion used by DoF economists to assess new energy investments. The main funders in this space such as SALIX Finance use up to **eight years of payback for mature technologies,** up to **ten years for maturing technologies** and **longer periods for less mature technologies.**

A number of stakeholders have informed us that there are many examples of good projects that are close to five-year paybacks. If investment criteria were more consistent with industry standards, this would present a significant opportunity. In line with the NIAO recommendation[37] to develop invest to save criteria, and based upon assessment of recent property and energy investment activity, a ten-year payback would be a sound basis for developing criteria.

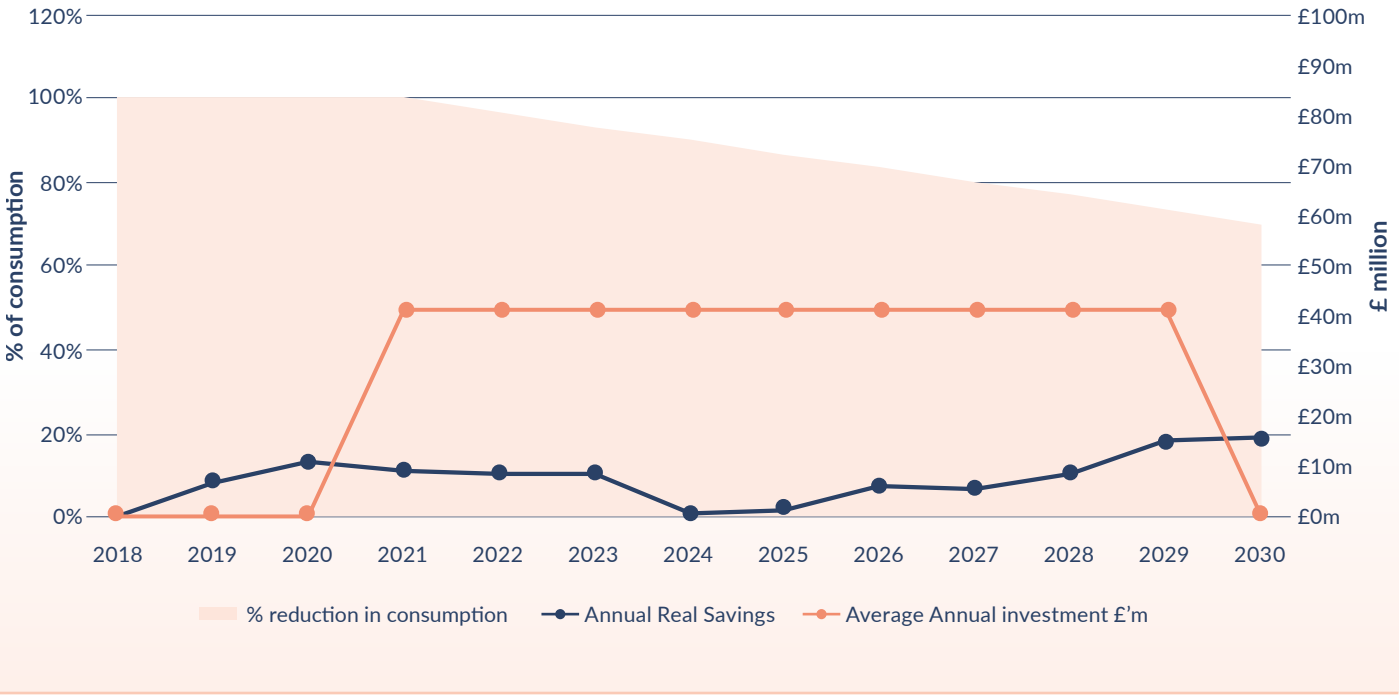
As part of the development of this Strategy, the cost of achieving a 30% target in the reduction of energy consumption has been estimated to require a total investment of £370 million of CAPEX . This has been modelled across two scenarios.

SCENARIO 1 – INVEST £370M OVER A 9-YEAR PERIOD 2021-2030

This scenario considers annual resource savings to 2030, resulting in cumulative savings of £95m by 2030, with an annual yearly investment of £41m required, as set out below. This is based on two years of mobilisation and procurement followed by delivery each year to the target data in 2030:

30% reduction - 9 year investment programme annual

30% Consumption Reduction by 2030 Annual investment: 9 years from 2021 -2029



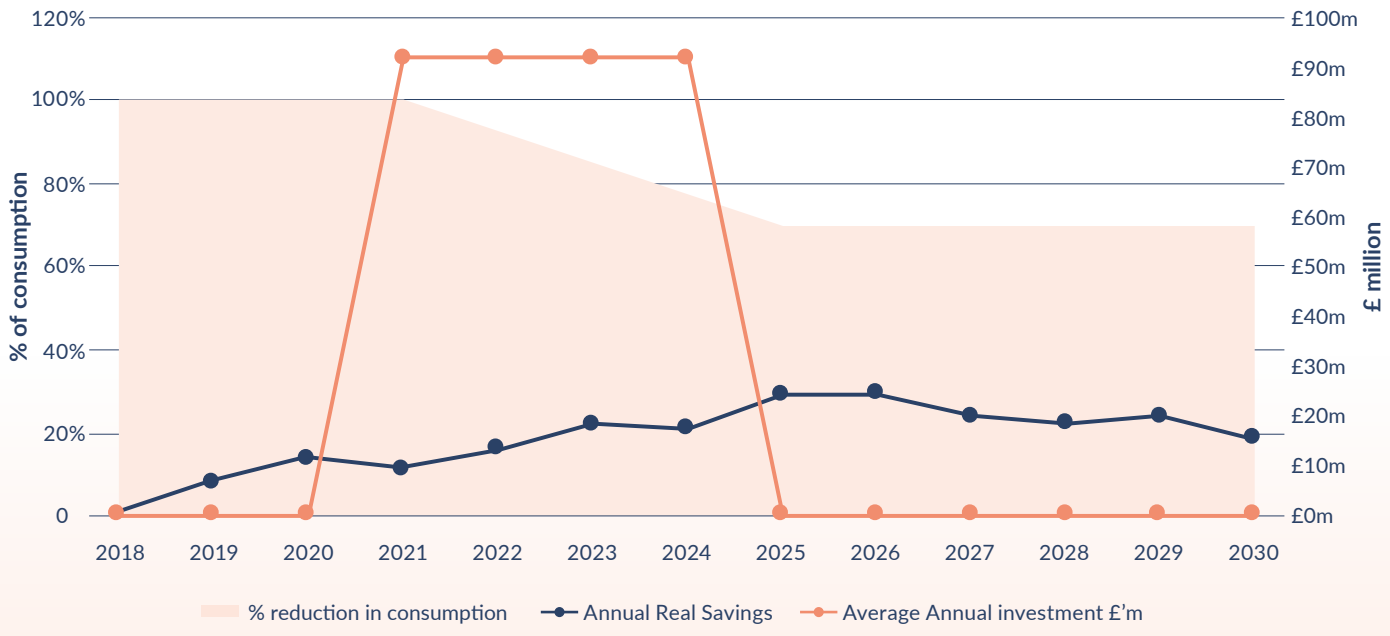
[37] www.niauditoffice.gov.uk/publication/invest-save-0

SCENARIO 2 – INVEST £370M OVER A 4-YEAR PERIOD 2021- 2025

This scenario considers annual resource savings to 2030, resulting in cumulative savings of £199m by 2030, with an annual yearly investment of £92m required, as set out below. This is based on two years of mobilisation and procurement followed by delivery each year to the target data in 2030:

30% reduction - 4 year investment programme annual

30% Consumption Reduction by 2030 **Annual investment: 4 years from 2021 -2025**



TARGETING INVESTMENT

As outlined previously in the baseline, 96% of the annual energy consumption for Government is split across five departments, DoH (39%), DfI (25%), DE (21%), DoJ (8%) and DfE (3%). For indicative purposes only using the scenarios outlined above, investment could be targeted based solely on consumption as follows:

Dept	Total CDEL * Investment £m	9 year investment period annual CDEL £m	4 year investment period annual CDEL £m
DoH	144	16	36
DfI	92	10	23
DE	77	9	19
DoJ	30	3	8
DfE	11	1	3
Others	16	2	3
Total	370	41	92

* CDEL = capital funding available to Departments.

However, it should be noted that such an investment targeting methodology that allocates by consumption would need to be reviewed annually and re-visited after the implementation of low and no-cost interventions.

Energy Performance Contracts

Alternative funding models exist. One option for funding energy consumption reduction interventions, common in the private sector, is to use an Energy Performance Contract (EPC) model, which could be used to fund and deliver projects in cases where capital funding is not available.

While there are varying types of EPCs[38] the simplest is an agreement between the owner of a property portfolio (e.g. Government) and a specialised entity, referred to as an "Energy Service Company" (ESCO). The ESCO will design, fund and implement the energy conservation measures to reduce carbon emissions and achieve guaranteed annual energy resource savings. This is governed by an EPC.

In essence, if EPCs were to fund energy interventions in the Government estate instead of normal capital, the resource savings would be shared (rather than the NICS capturing it all) with an ESCO in order to cover their initial asset investments and provide them with a reasonable rate of return.

Since EPCs are designed to mobilise investment in energy efficiency they offer the Government a real alternative funding opportunity (subject to accounting classification resolution). Revised treatment would offer an opportunity to expand energy efficiency investments using private sector technology, know-how and finance.

An attractive feature of EPCs is that the investors are incentivised to make sure assets are performing to a high standard. EPCs are already commonly used by private companies and many local authorities in GB as a valid alternative to capital funding and have been tested at business case stage.

For example, in GB the Carbon and Energy Fund (CEF), which was launched in 2011, was created by the NHS for the NHS and wider Public Sector. It was specifically created to fund, facilitate and project-manage complex energy infrastructure upgrades. The CEF provides an efficient and proven Official Journal of the European Union (OJEU) compliant procurement process with access to a £300m+ fund of capital funding. The case study overleaf demonstrates a successful CEF project in the health sector.

The CEF has a track record of over 40 successful UK projects to date.

So far it has projected 163,000 tonnes of carbon savings per annum – the equivalent of making seven acute hospitals zero carbon. £200m of infrastructure replacement has been funded to date across 40 health trusts, with £86m of cost savings since 2013 (£21.5m in 2018 alone).

[38] EPCs have provoked debate among EU member states in regard to their accounting classification as to whether the funded assets sit "on balance sheet" or "off balance sheet". In September 2018 Eurostat published a revised guidance note. Given that the September 2018 position effectively runs contrary to earlier EUROSTAT guidance, it has stimulated a range of concerns among Member States, and the published guidance is now subject to a UK consultation. Currently DoF advise caution when making policy decisions based on the latest guidance and since the classification has not been tested, ONS is keen to see some real contracts to use as test cases. Scottish Futures Trust (SFT) is working to develop real cases that will test the classification. It should be noted that ONS currently considers all EPCs as capital.

CASE STUDY – NORTHAMPTON GENERAL HOSPITAL NHS TRUST

In 2014 Northampton General Hospital Trust commissioned Vital Energi to design, install and maintain a new £2.8m heating and hot water system including CHP and biomass. This investment is estimated to save the Trust more than £840,000 per year in energy costs and will reduce carbon emissions by nearly 4,500 tonnes per year.

The company was awarded the contract after creating an innovative technical and commercial solution, which enhances the Trust's original CHP and biomass proposal. Vital Energi also provided all maintenance and life cycling of the new plant over a 15-year performance contract.

Generation and Storage Opportunities

The potential for Government to become a self-generator and/or a producer of energy needs further examination. While excellent work has taken place in Forest Service, this is in isolation from other parts of Government. Neither has this learning been shared to allow others to explore their potential in an efficient way.

In addition, Government must also consider how energy is traded, sold and stored. For example, we know there is potential for renewable generation to be located on the Government estate, which could be used to provide electricity for its own needs.

While challenges exist, it is clear generation and storage has significant potential to offset imported grid electricity and improve net energy performance.

In addition to offering the obvious benefits of physical resilience in times of power supply interruption, generation and storage (storage in particular) this also offers new opportunities for "arbitrage", at times when electricity is very expensive.

Storage (e.g. battery storage) can be used instead of importing from the national grid and the opposite when at times of cheap power. Batteries, for example, offer the opportunity for physical and financial resilience and the new Integrated Single Electricity Market (I-SEM) presents the opportunity to actively trade this capacity.

RECOMMENDED ACTIONS AND BENEFITS

It is essential that a robust pipeline of potential energy saving projects is developed and that this is regularly reviewed and updated as appropriate.

This pipeline will provide organisations and management with up-to-date access to opportunities. It will allow for tailored project development assistance around securing business case approval, procurement, project design, management and financing, as well as assistance for suitable projects to seek innovative market solutions.

Only such a holistic overview can be considered strategic. This will allow for more efficient procurement and project management through to delivery.

The establishment of a large project pipeline of potential energy intervention projects has begun through the Energy Management Forum. Already £170 million worth of investments has been identified from across the Government estate covering schools, offices, prisons, hospitals and street lighting.

This list of projects, included at Annex C, highlights the practical actions that can be taken to activate the energy saving potential that exists. The projects range from minor to substantial and are likely to have expenditure profiles over multiple years.

With clarity on the project pipeline it would be possible to put in place a centrally procured framework for the most typical interventions, such as building renovations and fabric improvements, lighting upgrades, boiler replacements, new and upgraded data gathering systems and generation/storage solutions. This approach to procurement will also be an important tool for the aggregation of smaller scale projects, particularly with regard to lighting and boiler upgrades.

Sara Venning NI Water and Leo Martin, Grahams at the opening of the solar farm at Dunore Point Water Treatment Works

NI WATER DUNORE POINT SOLAR PV FARM

In March 2018 NI Water opened their Dunore Solar Farm at a cost of £7m, on a 33 acre site on the eastern shore of Lough Neagh.

It is expected to save over £500,000 annually in energy costs. The c. 5MW site is one of the largest solar farms in NI featuring 24,000 solar panels turning what was a green field into a green power station.

This produces enough electricity to supply the power needs of Dunore Water Treatment Works and will save around 2000 tonnes of carbon every year.

The solar farm will help NI Water to reach its goal of increasing electricity consumption from renewable sources from the current 13% to 40% by 2021.

As part of their community engagement NI Water organised, a competition with local schools, challenging them to “Save Water & Save Energy”.

Recommendation 6	Create an Energy Invest to Save fund		
Optimise Actions		**Step Change Actions**	
6.1	By the end of 2019/20 DoF and EMU agree to set investment criteria and benefits appropriate for an Energy Invest to Save approach to funding across Government.	**6.4**	By the end of 2019/20 the EMU will work with DoF to agree the nature and timing of an "Energy Invest to Save" Fund.
Action Owner	DoF, EMU and all other Departments	**Action Owner**	DoF & EMU
6.2	By the end of 2021/22 the EMU, along with CoPEs, will coordinate a review to develop potential energy efficiency frameworks and energy performance contracting opportunities.		
Action Owner	EMU, CoPEs & DoF		
6.3	By the end of 2022/23 the EMU shall examine the potential for renewable generation and storage across the Government estate.		
Action Owner	EMU		

BENEFITS

1. Ensuring investment criteria are established is consistent with NIAO recommendations. This supports innovation, shows that the NI Government is taking leadership and ensures that projects, which might not otherwise get funding, have a potential route.
2. Reviewing framework and EPC opportunities will help to efficiently procure and deliver interventions, will ensure consistency between departments facilitating better O&M, and will allow access to alternative funding streams to complement/act as an alternative to traditional capital investments.
3. Exploring the potential for generation/storage to make a contribution to the net 30% consumption reduction target by offering self-supply to offset the need to buy from others. In addition, it could facilitate others to generate, thus allowing Government to earn revenues and offer greater physical resilience from power cuts and outages. It could also offer support for wider policy objectives such as decarbonisation of the power sector, increasing security of supply etc.
4. Establishing an Invest to Save fund will ensure there is sufficient certainty of funding at a macro level to deliver on consumption reduction targets and increase the chances of leveraging greater behavioural changes when staff see funding support.

PROCUREMENT

Baseline findings

- Government spent £123 million on energy in 2016/17 and this is predicted to rise by 25% in real terms by 2030.
- Procurement processes are well structured and robust.
- Buying strategies differ between CoPEs with limited evidence of active buying (including price hedging for a period).

The CoPEs are very efficient and capable at preparing and running procurement competitions that comply with the procurement guidelines but contain few energy specialist resources and have limited access to energy information and the characteristics of its demand profile.

Resources such as access to a range of long-term commodity cost estimates, long-term fuel cost estimates and currency projections are all common information feeds to energy decision-making in organisations that actively buy.

Improved access to resources and information has been highlighted by the CoPEs and their clients as something they would like to see going forward. For most users it's not the cheapest absolute price in the short-term that matters but medium to long-term price certainty that helps to facilitate budgeting.

Given that wholesale energy is traded over short periods of time, market price fluctuations and volatility are normal. Many of the services offered by Government aren't easily shut down or reduced to respond to these fluctuations. Therefore avoiding price volatility is generally an important consideration for Government organisations.

A number of the current buying strategies leave Government exposed to price swings, adding to pressures or resulting in easements depending on how prices move. Risk is therefore a key consideration in any buying strategy. More work is required to consider what a Low/Medium/High attitude to risk would mean for departments and how differing procurement strategies would result in a differing range of energy costs as a result. The ultimate objective is to assist departments in assessing their risk appetite for energy procurement and what value can be achieved.

Evidence to date suggests these decisions aren't taken consciously. As a result, the risk strategy tends to default to the lowest risk option. By understanding risks better and what each organisation's attitude is to these, there is a significant opportunity to better manage price fluctuations at least cost and offer resource savings by buying what is required rather than the least risky option (which is almost always the most expensive).

Buying strategies need to reflect attitudes to risk and there is an opportunity to put those groups with similar attitudes to risk together to ensure those with different risk profiles get the benefits of this. Some risk toleration in medium-term price and budget certainty will likely provide cost benefits in most years.

However, there could be years where budgets are exceeded due to risks held by Government being realised. It could be helpful if a mechanism to recognise and smooth out such perturbations could be found.

We believe there is significant opportunity in matching public sector users together in ways that current structures don't facilitate. For example, by tendering organisations with a lot of night-time load

such as NI Water together with organisations with a large day-time load such as the education sector would offer a substantial amount of predictable flat load with little need for balancing. This is the type of demand suppliers like.

Key to smart buying is information and consumption data. In many cases this information either isn't capable of being shared with consumers or buyers due to IT/communications issues; or where this is possible, the users/buyers don't have the systems or resources to interrogate the data and act on it in terms of procurement behaviour.

The pre-procurement phase is critical. It is important that information is available then in order to ensure there is informed and collegiate decision-making. The Procurement and Commercial Sub-group concluded that it was evident there is not always time for a substantive engagement between energy consumers and purchasers in advance of the procurement process.

There is an opportunity through the outworking of this Strategy to bring relevant stakeholders together earlier and in a meaningful way, ensuring that the full range of procurement options are identified and considered in sufficient detail before a procurement has to go live. The practice of 'shadow runs' of a procurement model before a live implementation could help build confidence.

Evidence suggests that the buyers with the most market knowledge, data on consumption/price, and flexibility/risk appetite in terms of buying strategy achieve the lowest prices for energy.

RECOMMENDED ACTIONS AND BENEFITS

It is clear from the development work leading to this Strategy that the CoPEs already do an excellent job in managing the procurement process when buying energy. However, there is opportunity to deliver recurring resource savings and include wider energy services within the procurement process as required.

In order to capitalise on the opportunities outlined, there is a need for access to resources with the skills and expertise to advise on increased and/or pooling of existing expertise, as well as access to forward pricing information and to near/real-time data on consumption supported by systems.

In the first instance, these requirements can be largely provided by external advisers. An alternative or complementary option is to have internal resources doing some or all of these tasks. These internal and/or external resources, informed and assisted with the required information and systems, will work with the various CoPEs and assist with delivering on the opportunities.

This should be done in a co-ordinated manner using the scale and buying power of Government as well the existing procurement and technical expertise that exists.

Recommendation 7	Develop better energy buying
Optimise Actions	
7.1	By the end of 2019/20 the EMU will improve collaboration between CoPEs, and Departments focussing on the pre-procurement phase.
Action Owner	EMU, CoPEs & Departments
7.2	By the end of 2020/21 the EMU, working with CoPEs and Departments, shall facilitate a risk review of buying strategies to include consideration of renewable energy procurement across the Government estate.
Action Owner	EMU, CoPEs & Departments
7.3	By the end of 2019/20 the EMU shall facilitate access to specialist market intelligence and seek to establish an Energy Buyers Group.
Action Owner	EMU

BENEFITS

1. **Ensuring better pre-procurement processes are in place will result in better alignment of interests in procurements, resulting in improved customer satisfaction and more accurate procurement leading to more efficient processes.**
2. **Reviewing buying strategies will result in more financial resilience, offering protection from short-term price fluctuations and meaning that procurements will be informed by risk information.**
3. **Establishing a buyers group will lead to better alignment and knowledge of products, resulting in resource savings from reduced energy bills.**

BUILDING PERFORMANCE STANDARDS AND MINIMUM REQUIREMENTS

Baseline findings

- Unlike in other jurisdictions, building regulations are the minimum standards for energy in the vast majority of procurements.
- BREEAM Excellent is a mandatory consideration, not a mandatory requirement.
- Those with most knowledge and vested interests in the management of assets are not always involved at the specification stage.
- The true cost of energy is difficult to disaggregate from other whole-life costs in cost plans and business cases.

Government spends approximately £730 million per year on new capital build projects and renovations/ refurbishments. Given the continued need to develop new assets and the sheer size of the Government estate with buildings of varying ages and quality, there is significant opportunity to realise savings.

While more work is required to determine this potential (including proper whole-life condition surveys of buildings as well as looking at departmental estate plans) the challenge is to really understand the scale of this opportunity in order to reduce consumption and the consequential positive impact this has in delivering long-term recurring resource savings.

This comes from a smarter approach to energy investment such as changed specifications to ensure energy efficiency is embedded right at the start. In addition, the business case has a key role to play by ensuring that the impact of these specifications on whole-life costs are properly considered and value engineering decisions documented.

RECOMMENDED ACTIONS AND BENEFITS

As with buying energy, the CoPEs and their procurement "processes" are extremely robust for capital buildings. However, the buildings delivered tend to reflect the minimum requirements of Building Regulations and BREEAM (where deliverable).

The challenges are therefore focused on ensuring investments in energy efficiency are properly assessed in terms of revenue savings in economic appraisals in much the same way Buy Social has been integrated into procurement processes in recent years. This is a challenge that cuts across not only Departments and CoPEs but also those staff involved in specifying and appraising projects.

The Scottish Government has set a long-term emissions reduction plan for all of Scotland by designating energy efficiency as a national infrastructure priority. Their plan seeks to achieve Near Zero Emissions Buildings by 2050. Invariably this means exceeding their Building Regulations minimum standards.

In terms of procurement specifications, energy efficiency and reduction measures which were previously "nice to have" are now "non-negotiable" requirements. While the Scottish use BREEAM, this is as a measurement tool only. Their reflections are that real changes occur from changing minimum standards in requirements, and in their case this meant going beyond what was needed in order to comply with Building Regulations.

The opportunity for Northern Ireland is twofold.

1. **Revised standards and specifications that form part of the tender process so that they define and set a compulsory minimum energy use target for new builds and refurbishment projects.**
2. **The need to ensure the value engineering and business case process appreciates that in some cases short-term capital cost savings can have long-term operating cost impacts.**

Recommendation 8	Work in collaboration with relevant partners to ensure building standards contribute to the 30% energy consumption reduction target		
Optimise Actions		**Small Change Actions**	
8.1	By the end of 2019/20 CoPEs should include operations and facilities management staff at pre business case stage to ensure energy reduction considerations are embedded into the design upfront.	**8.2**	By 2021/22 the EMU will, in collaboration with CoPEs and Departments, undertake a review of energy specifications, standards and guidance in use across Government essential to support and sustain the delivery of the 30% energy consumption reduction by 2030.
Action Owner	CoPEs	**Action Owner**	EMU, CoPEs, Departments

BENEFITS

1. **Ensuring that facilities management staff with long-term operational responsibility for assets are involved in the design is likely to result in lower or narrowed "performance gaps".**
2. **Review of all energy specifications ensures that appropriate energy considerations are embedded at the start, delivering recurring resource savings and disaggregating energy from wider FM cost assumptions.**

THE WAY FORWARD

This Energy Management Strategy and Action Plan for the Government offers a coherent and deliverable opportunity to reduce energy consumption, save money, reduce harmful emissions, enhance the security and resilience of NI's energy supply as well as directly supporting wider national and international objectives on energy and climate action.

Through dedicated management and policy responsibilities using existing expertise, augmented by additional staff and systems as appropriate, it is vital for Government to demonstrate exemplary leadership in the transition to a low carbon energy future.

While funding is an essential element to deliver energy intervention measures, financial investment alone will not deliver the maximum potential energy savings. New policies and procedures are also a critical part of this. The Action Plan, included at Annex D, lists the range of actions that will be delivered by this strategy.

Ultimately savings will be delivered by people: through better understanding of energy usage and systems; by better awareness of their role in the wider energy environment; and through staff taking individual decisions to use energy more efficiently.

ACKNOWLEDGEMENTS

SIB would like to thank all Departmental, Arm's Length Bodies and advisory representatives that have provided their time, knowledge and data through the Energy Management Forum and its associated subgroups during the development of this Energy Management Strategy for Northern Ireland Central Government. We would not have been able to complete this work without such support.
We wish to thank the following organisations for their contributions:

BRE

Business Services Organisation

Carbon Trust

Central Procurement Directorate

Department for the Economy

Department of Education

Department of Agriculture, Environment and Rural Affairs

Department of Finance

Department of Health

Department for Infrastructure

Department of Justice

Dublin City University

Education Authority

Health and Social Care Trusts

NI Water

Police Service NI

Scottish Futures Trust

University of Ulster

Utility Regulator

Welsh Government

ANNEXES

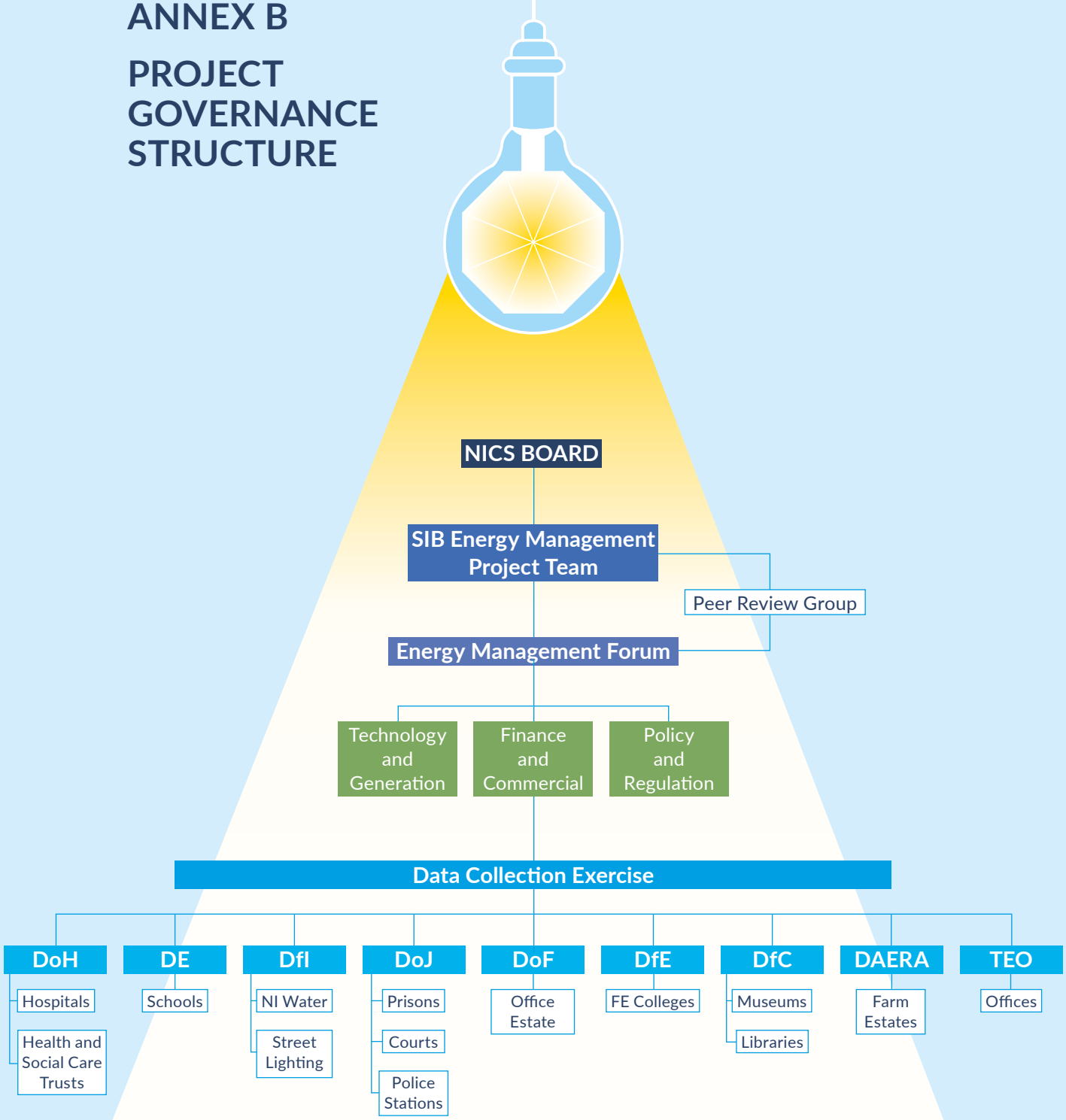
ANNEX A
LIST OF PARTICIPATING BODIES

Annex A	List Of Participating Bodies			
TEO	**INDEPENDENT**	**DAERA**	**COMMUNITIES**	**ECONOMY**
Core Department				
Commission for Victims and Survivors	Audit Office	NIEA	Armagh Observatory and Planetarium	Invest NI
Commission for Public Appointments	Assembly Commission	CAFRE	Arts Council	Tourism NI
Community Relations Council	Public Prosecution Service	Forest Service	Commission for Older People	H&S Executive
Equality Commission	Parliament Buildings	AFBI	Charities Advisory Committee	Consumer Affairs
Maze/Long Kesh Dev Corporation		Agricultural Wages Board	Historic Buildings Council	Consumer Council
Judicial Appointments Commission		Livestock and Meat Commission	Historic Monuments Council	Industrial Court
Office of the Attorney General		Loughs Agency	Libraries NI	Utility Regulator
SIB		Fishery Harbour Authority	Local Government Staff Commission	InterTradeIreland
Victims and Survivors Service		Council for Nature and Conservation and the Countryside	National Museums	The Labour Relations Agency
			Museums Council	The Industrial Court
			Commissioner for Children and Young People	NI Screen
			NIHE	Industrial Tribunals and the Fair Employment Tribunal
			Local Government Superannuation Committee	South West
			Foras na Gaeilge	Northern
			Sport NI	Southern
			Advisory Group for Architecture and the Built Environment	South Eastern
			Office of the Social Fund Commissioner	Belfast Met
			Vaughan Trust	North West

Annex A	List Of Participating Bodies Continued			
EDUCATION	**FINANCE**	**INFRASTRUCTURE**	**HEALTH**	**JUSTICE**
Core Department				
Comhairle na Gaelscolaíochta	NISRA	NI Water	BSO	Forensic Science NI
CCMS		Translink	Food Standards Agency	Courts and Tribunals Service
Education Authority		Drainage Council	H&SC Board	Legal Services Agency
NI Council for Integrated Education (NICIE)			Patient and Client Council	Youth Justice Agency
Youth Council			Public Health Agency	Prison Service
			Fire and Rescue Service	Coroners Service
			Ambulance Service Trust	Criminal Justice Inspection
			Blood Transfusion Service Agency	Policing Board
			Guardian Ad Litem Agency	Parole Commissioners
			Medical and Dental Training Agency	Planning and Water Appeals
			Practice and Education Council for Nursing and Midwifery	Police Ombudsman
			Social Care Council	PSNI
			Regulation and Quality Improvement Authority	Prisoner Ombudsman
			Belfast H&SC Trust	Probation Board
			South Eastern H&SC Trust	Police Rehabilitation and Retraining Trust
			Southern H&SC Trust	Compensation Services
			Western H&SC Trust	
			Northern H&SC Trust	

ANNEX B

PROJECT GOVERNANCE STRUCTURE



ANNEX C

Annex C	List Of Proposed Energy Reduction Investment Projects			
The table below indicates a list of energy reduction projects put forward by departments.				
	INTERVENTION	PROJECT NUMBERS PROPOSED	COMBINED VALUE	ESTIMATED PAYBACK PERIOD (YRS) **
1	Street Lighting	1	£50,000,000	0-6
2	Building LED Lighting	23	£39,878,873	0-6
3	M & E Equipment	50	£22,939,547	0-6
4	Metering and Analysis	19	£15,380,700	0-6
5	Borewell	3	£1,515,027	6-12
6	CHP	1	£400,000	6-12
7	Building Fabric	7	£10,371,808	6-12+
8	Battery Trial	EMU, CoPEs & Departments	To be added	
9	Biomass	1	£500,000	6-12+
10	Energy Centre	3	£18,000,000	12+
11	Renewable Generation	9	£3,995,272	12+
	TOTAL	119	£171,031,227	

** Typical paybacks are presented assuming works in 2018. These are indicative and can change over time. They are affected by changes such as technology improvements, capital costs and wholesale price changes.

ANNEX D
ACTION PLAN 2018-2030

ACTION PLAN: An Energy Management Strategy for NI Central Government

	Action	Owner
2018/19	By the end of 2018/19 DfE and DoF should agree arrangements for the ownership and oversight of energy management in Government.	DfE & DoF
	Continue the established Energy Management Forum for information sharing, collaborative working and skills/capacity building to sustain momentum for energy efficiency.	EMU
	By the end of 2018/19 DfE and DoF to agree with SIB roles, responsibilities and resourcing of an EMU.	DfE & DoF
	By the end of 2018/19 agree to implement an energy consumption reduction target of 30% by 2030 against a 2016/17 baseline of 1867 GWh, reviewed annually.	NICS Board
	Prior to the closure of the CRC in 2019, DfE and DAERA should agree arrangements to co-ordinate and publish the annual collection of all NI Central Government large users' energy data, including mandatory emissions recording and reporting, in the same way DfE plans to do for the private sector.	DfE & DAERA
2019/20	From 1 April 2019 Government bodies will be responsible for collecting energy consumption data annually at building/facility level, including across all their ALBs to improve and sustain monitoring, targeting and reporting across Government, and should utilise existing departmental Asset Management Plans to present key energy data and ensure alignment with operational investment initiatives.	Each Department
	In 2019/20 the EMU will scope and develop a business case for the roll-out of automatic metering and analytics capabilities initially across the high energy users in the NI Central Government Estate.	EMU
	During 2019/20 the EMU will undertake co-ordination of the development of energy investment opportunities across Government and produce information of a quality suitable for business case preparation to inform future budget planning.	EMU & relevant Departments
	By the end of 2019/20 DoF and EMU agree to set investment criteria and benefits appropriate for an Energy Invest to Save approach to funding across Government.	DoF, EMU and all other Departments
	By the end of 2019/20 the EMU will improve collaboration between CoPEs, and Departments focussing on the pre-procurement phase.	EMU, CoPEs & Departments
	By the end of 2019/20 the EMU shall facilitate access to specialist market intelligence and seek to establish an Energy Buyers Group.	EMU
	By the end of 2019/20 CoPEs should include operations and facilities management staff at pre-business case stage to ensure energy reduction considerations are embedded into the design upfront.	CoPEs
	In 2019/20 commence an energy behavioural change campaign across NI Central Government.	DfE & EMU
	By the end of 2019/20 an EMU will establish project support requirements with Departments, and work with stakeholders to bring forward immediate behavioural change, through low and no-cost measures, where possible.	EMU
	The EMU will produce an Annual Energy Report to provide the NICS Board and/or the Executive with a means of tracking progress and assessing performance.	EMU
2019/20	By the end of 2019/20 the EMU will work with DoF to agree the nature and timing of an "Energy Invest to Save" Fund.	DoF & EMU

ACTION PLAN: An Energy Management Strategy for NI Central Government

	Action	Owner
2020/21	By the end of 2020/21 the EMU, working with CoPEs and Departments, shall facilitate a risk review of buying strategies to include consideration of renewable energy procurement across the Government estate.	EMU, CoPEs & Departments
2021/22	By the end of 2021/22 EMU, along with CoPEs, will coordinate a review to develop potential energy efficiency frameworks and energy performance contracting opportunities.	EMU, CoPEs & DoF
	By 2021/22 the EMU will, in collaboration with CoPEs and Departments, undertake a review of energy specifications, standards and guidance in use across Government essential to support and sustain the delivery of the 30% energy consumption reduction by 2030.	EMU, CoPEs, Departments
2022/23	By the end of 2022/23 the EMU shall examine the potential for renewable generation and storage across the Government estate.	EMU
2024/25	By the end of 2024/25 undertake a midterm review of this strategy.	DfE
	Legislate for mandatory responsibility if necessary and when appropriate.	DfE
	Introduce legislation for a mandatory energy consumption reduction target if necessary and when appropriate.	DfE