

## Public/private advisory service to promote water/heating/lighting efficiency

### 1. EXECUTIVE SUMMARY

- 1.1. The single biggest sector, by emissions figures is energy use of buildings. In 2017 approximately 296,000 tonnes (35%) of the Island's CO<sub>2</sub>e emissions came from heating appliances that burn fossil fuels such as oil and gas (Aether, 2019).
- 1.2. It would be possible to re-launch previous successful energy efficiency schemes such as the "Energy Doctor" via a Non-Government Organisation at modest costs (£120k in 2008-2011).
- 1.3. It would be beneficial to launch an energy advice / support scheme to follow the introduction of the Standard Assessment Procedure (SAP) - energy ratings for buildings launch in January 2020, and to coincide with the revision of existing Building Regulations.
- 1.4. Introducing internet-based Energy Advice Service, akin to UK Energy Savings Trust "Home Energy Check" would provide an objective, neutral advisory service.
- 1.5. There is a need to increase incentives (grants, 0% loans, low interest loans) for home owners to improve take up of energy efficiency works, as uptake of current scheme is consistently low.
- 1.6. To support effective implementation of energy efficiency measures, a training programme to upskill the existing construction sector workforce will be required. A properly skilled workforce is critical to enabling effective deployment of energy efficiency and low-carbon heating measures which perform as they should.
- 1.7. Fuel Poverty remains an issue: the 2018 Private Sector House Condition Survey. Based on the definition of spending >10% of their annual household income on energy, on this measurement, 4,000 private sector households (11.6%) are affected. Energy efficiency programmes should be targeted at those properties and households most in need.

### 2. THE CHALLENGE

- 2.1. The Isle of Man (IOM) has declared a climate change emergency with the ambition to become a "Net Zero" Greenhouse Gas Emissions community and economy by 2050.

#### The context

- 2.2. Energy use, specifically heating our buildings is the largest single source of greenhouse gas emissions in the Isle of Man in 2017, accounting for 35% of all emissions. Note this is based on Scope 1 emissions (i.e. direct emissions from within

IOM territory); further emissions would apply to the supply chain in Scope 2 and 3. Addressing scope 1 emissions will be key if the Island it to achieve net zero emissions by 2050.

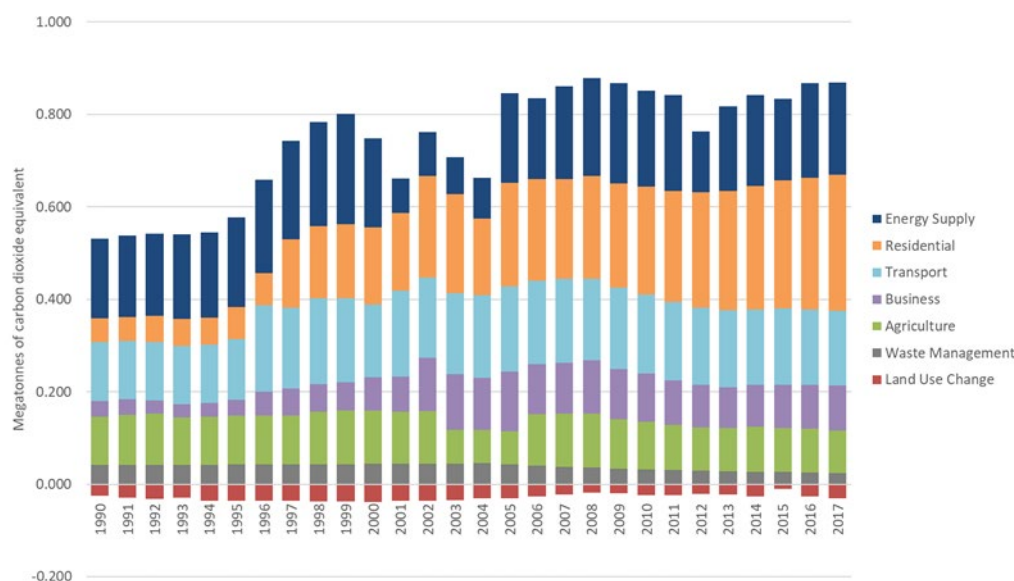


Figure 1 Total Isle of Man greenhouse gas emissions by sector 1990 – 2017, Extract from: Aether: Guide to the Isle of Man Greenhouse Gas Inventory, October 2019.

2.3. To achieve this objective, the current UK policy, outlined in the UK’s Committee on Climate Change (UK CCC) document “Net Zero: The UK’s contribution to stopping global warming” will be invaluable.

**Buildings**

2.4. The UK CCC core scenario for buildings reflects an improvement in energy efficiency and an increasing uptake of low-carbon heating. Current Isle of Man Government aspirations and commitments (e.g. to make as many homes as possible EPC band C by 2035, and to stop the installation of gas heating in new homes from 2025), whilst in need of strengthening and extending, target the decarbonisation of homes.

2.5. Ensuring homes are energy efficiency and moving heating systems to low-carbon heating remains a major challenge. The Isle of Man Government via the Department Environment, Food and Agriculture (DEFA) (and formerly Department of Local Government Environment) carry out periodic Private Sector House Condition Surveys, every 10 years. Fortuitously this last year has been the most recent survey. Historically the survey has been used to monitor dilapidations and housing fitness standards, although more recently an energy metric was included. Until recently this enabled and justified flexing of grant support for energy efficiency improvements.

The current SAP rating for private housing on the Island is measured at 53, above the national average for all private housing in England (47). The equivalent NHER Rating is 8.7.

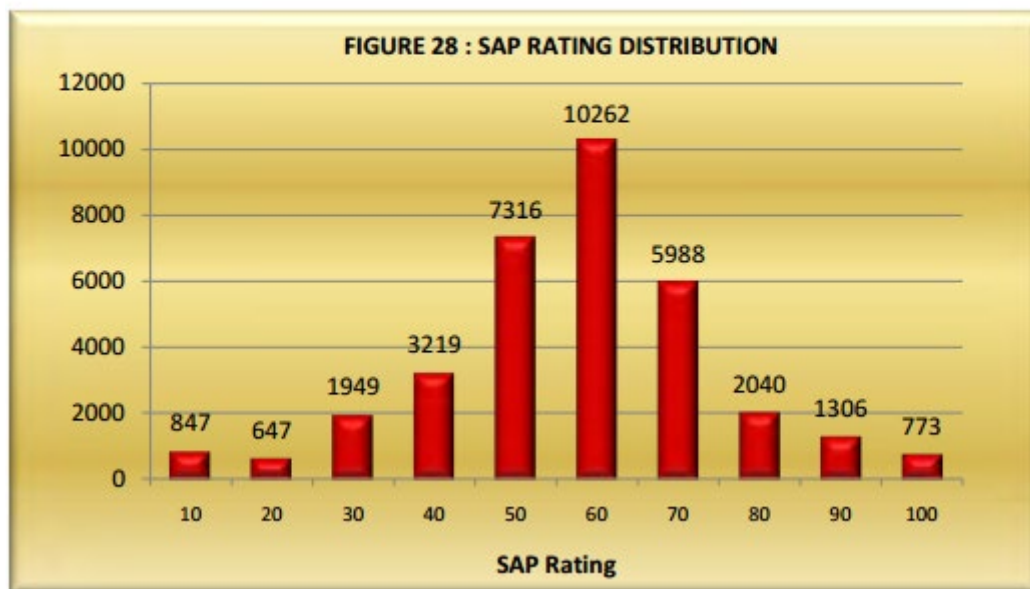


Figure 2 Isle of Man SAP rating distribution, Extract from:

[https://www.gov.im/media/208720/private\\_sector\\_house\\_survey.pdf](https://www.gov.im/media/208720/private_sector_house_survey.pdf) Page 46

- 2.6. It is noted there was significant improvement in average private sector energy efficiency ratings between 2002 and the following survey in 2008, whereby SAP rating improved to 53 (See section 3.7 for explanation of SAP rating system). However, this improvement has not been apparent in the most recent 10 year period. Based upon the collected data, the estimated average SAP score for private sector dwellings on the Isle of Man is 54. There is little difference between tenures, with the average SAP for owner-occupiers being 54 and for privately-rented dwellings 56. Dwelling age has a significant impact on the average SAP score, such that dwellings built post 1981 exhibit an average SAP score of 66 compared with 42 for dwellings built pre-1919.
- 2.7. The report is also able to capture a meaningful estimate of levels of household fuel poverty. This has been measured based upon the 10% definition, whereby any household is required to spend more than 10% of their annual household income on modelled running costs are said to be fuel poor. On this measurement 4,000 private sector households (11.6%) are estimated to be in fuel poverty. There is little difference in the rate of fuel poverty between tenures, but households occupying dwellings constructed post 1981 are significantly less likely to be in fuel poverty (5.8%) compared to those in pre 1919 properties (21.3%).
- 2.8. An ambitious domestic net-zero target should be leveraged with wider actions in order to maximise its impacts.
- 2.9. The priority for the Isle of Man should be to focus on actions that will have the

largest impact in the transition to a low-carbon economy, while at the same time being consistent with the achievement of sustainable development goals (SDGs) and building on the areas where it has particular advantages.

- 2.10. The United Nations Sustainability Development Goals include 'Affordable and Clean Energy' (Goal 7), and the Isle of Man Governments Policies could align with this as a way of creating more sustainable and inclusive communities that are more resilient to environmental issues such as climate change

### **Investment levels and financing**

- 2.11. According to the UK CCC the costs associated with heat decarbonisation are expected to remain a significant proportion of the total costs of decarbonising the UK, and therefore by analogy, the Isle of Man economy.
- 2.12. The UK CCC notes that the absence of public engagement on these critical issues must be addressed, to prepare for and inform the changes to come and to enable individuals to take action now to drive down emissions associated with their homes and businesses.
- 2.13. Public acceptance will be required in order to enable the deployment of measures to realise deep emissions reductions in buildings. However, awareness of the changes needed is currently very low, and barriers exist which can prevent uptake even where there is occupant appetite. Furthermore, it is important that once measures are installed, they perform as they should - in some cases this will require behaviour change. A relevant exemplar project could be replicated in the Isle of Man. The Cold Homes Energy Efficiency Survey Experts (C.H.E.E.S.E.) Project is a Bristol-based not-for-profit that aims to reduce domestic energy losses, at low cost: surveys start at just £100 and are free to people in poor housing conditions and in fuel poverty. Thermal-imaging surveys identify where homes are losing heat and where measures could be taken. This provides the householder with the information needed to make low-cost impactful remedies to save money, improve comfort and wellbeing, and reduce energy consumption and carbon footprint. The CHEESE project has been running since 2014/15. It is estimated that 30% of heating losses are due to drafts, which can be fixed cheaply and easily when they have been identified. <https://cheeseproject.co.uk> (Bristol, 2014 onwards).
- 2.14. A further example of a peer region's approach comes from Cumbria. CAFS [www.cafs.org.uk](http://www.cafs.org.uk) – (Carlisle Action for Sustainability) (NGO) run training courses for tradespeople on how to improve and retrofit and insulate older housing stock. CAFS seem to be well regarded, and usefully show YouTube videos on a renovation project.
- 2.15. Even where building occupants are aware of the need for low-carbon measures, there can be barriers which prevent them from being installed. One example is the challenge posed by freehold/leasehold distinctions in property ownership, which can

create significant barriers for renovation of these buildings, but which the Isle of Man as an independent jurisdiction has the ability to influence.

- 2.16. Once measures are installed, they must be used effectively, which therefore implies an education role for householders and or trade suppliers. The CCC scenarios assume a move towards more 'informed' average use for occupants such as adequate window opening for ventilation and avoidance of moisture build-up, appropriate temperature set points, and maintaining integrity and avoiding damage of insulation layers.
- 2.17. New business models, alongside smarter technology, also have potential to support occupants in adopting and using low-carbon heating effectively; which includes 'heat as a service' propositions (Energy Service Company model). Such innovations may be relevant to the private sector and the likes of Manx Utilities Authority.

### **3. THE OPPORTUNITY**

- 3.1. The challenge of improving the existing building stock and performance of new properties is significant. In order to start as we meant to go on will require a step-change in energy performance. Informed by the analysis from the UK CCC it would be appropriate to expect that new homes in the Isle of Man from 2025 will be highly efficient and will have low-carbon heating, which is explored in more detail in work package 9.
- 3.2. To meet net-zero carbon emissions by 2050, Tynwald has approved changes to building regulations, which will come into effect on 31 December 2019.
- 3.3. The Isle of Man Government has already made change to Building Regulations that will require SAP Calculations for every building regulation submission.
- 3.4. What is a SAP Calculation?
  - The Standard Assessment Procedure is the methodology used to assess and compare the energy and environmental performance of dwellings. The purpose of this new requirement is to deliver a 6% improvement in new dwelling performance. SAP calculations are now a fundamental part of the design and building process. If a building achieves a high SAP Rating, fuel use will be low, as well as CO<sub>2</sub> emissions. Without a SAP calculation, the building will not be compliant with building regulations, and will not be signed off by building control.
- 3.5. The changes aim to improve energy efficiency, an essential component in meeting the Isle of Man Government's commitment to reach net-zero carbon emissions by 2050. Updating the Building Regulations is a vital step if the Island is to reduce its CO<sub>2</sub> emissions. Staged increases in levels of energy efficiency will be introduced over the next few years, and by end of this period, buildings would need to be Net Zero

Emissions, with a Building Regulation requirement to be a SAP rating of at least 97 by 1<sup>st</sup> Jan 2027. This incremental approach gives the construction industry time to adapt to the increasing standards and adopt improved technology.

3.6. SAP calculations are not just for new builds. Conversion and change-of-use schemes may also require a SAP Assessment.

3.7. How SAP ratings work:

- A SAP rating is a calculation that is required to produce a Predicted Energy Assessment and an On Construction Energy Performance Certificate.
- \* A SAP calculation is a score from 1 to 100+ that indicates the annual energy cost of a building. The higher the score, the lower the energy costs, with a score of 100 representing zero energy cost. Buildings with a rating above 100 are net exporters of energy. Building Regulations will require that a SAP calculation is submitted for new dwellings before the commencement of building work.
- A SAP calculation for new dwellings is a desktop exercise; the architect submits drawings, plans and specifications of the building to an assessor early in the design process in order to prevent any costly redesign of the dwelling.

3.8. SAP calculations involve four stages:

- Design - draft stage: The assessor calculates the building's energy performance based on information supplied by the architect. The software determines if the proposed dwelling complies with the Building Regulations. The assessor can use the software to model different variations of the design if the initial specification doesn't show compliance. The assessor will advise the architect of the shortfalls and recommend solutions as required.
- Design - the final stage: The client, architect and the assessor agree the finalised version of the design, and this may involve amendments to the initial design to achieve SAP compliance. The assessor produces a report that the client or architect will submit to Building Control, which will include a Predicted Energy Assessment based upon the detailed design.
- Built - draft stage: For the majority of new dwellings, an air pressure test will be required. The client or architect provides the results of the air pressure test to the assessor and also advises of any variations from the initial specification. Software is used to check that the finished building still meets the requirements of the Building Regulations. If it fails, the assessor recommends what remedial action needs to be taken.

- Built - the final stage: The assessor runs a final SAP calculation and creates an Energy Performance Certificate, with a rating of energy performance based upon the building as built.
- 3.9. An Energy Performance Certificate will need to be provided before a completion certificate is issued.
- 3.10. SAP calculations are not based on a site survey; therefore, it is critical that the correct information is submitted.
- 3.11. The improvements to the Buildings sector, both residential, commercial and public sector are important in order to reduce energy bills, reduce fuel poverty and increase suitability for low-carbon heating.
- 3.12. There have been useful projects in the past that have delivered significant energy and financial savings for householders – and which are increasingly recognised as delivering significant carbon savings as a co-benefit. These carbon savings have become ever more important, particularly so in the context of a Net Zero Greenhouse Gas Emissions by 2050 target.

**4. RECCOMENDED ACTIONS**

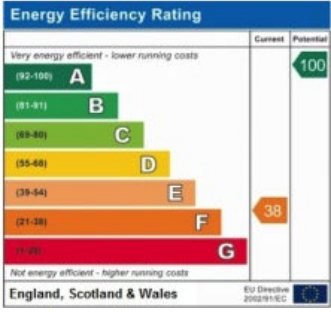
<b>Opportunity</b>	<b>Necessary Ambition</b>	<b>High Ambition</b>
<b>Establish energy efficiency within buildings as a national infrastructure priority</b> given its status as single largest contributor to Greenhouse Gas Emissions figures	By 2050 we will transform the Isle of Man’s buildings to be warmer, greener and more efficient.	Bring forward timelines.
<b>Eradicate Fuel Poverty</b> (or should this defer to Tranche 2 – Eliminate Fuel Poverty?)	The provisional 2019 House Condition Survey by DEFA This has been measured based upon the 10% definition, whereby any household required to spend more than 10% of their annual household income on modelled running costs are said to be fuel poor. On this measurement 4,000 private sector households (11.6%)	Target poorest households first and improve the properties SAP rating, on a fabric first approach.

	are estimated to be in fuel poverty.	
<p><b>Introduce internet based Energy Advice Service</b>, akin to UK Energy Savings Trust "Home Energy Check"</p> <p>Note, this would need to be well promoted so people use it. Must also be easy to use.</p>	<p>EST contacted about reviewing former Home Energy Check tool, and costs/timelines to do so.</p> <p>It is noted that in comparison to other jurisdictions, the UK with a population of 60million (Energy Saving Trust) has a staff number of &lt;200, UK Carbon Trust, 182FTE, Energy Action Scotland (Pop 5m) FTE 9, focussing on Fuel Poverty, Community Energy Scotland 15-20 FTE, Salix Finance for the UK, 40FTE, Enova (Norway, population 5m) 80FTE, Malta Intelligent Energy Mgt Agency 400,000 population, 7FTE, Cyprus Energy Agency 850,000 pop, 9FTE. Therefore based on IOM population being 80,000, FTE numbers would likely not be more than 1 or 2. (Eunomia, 2019)</p>	Bring forward timelines.
<p><b>Re-establish Energy Doctor Service</b>, via credible NGO such as Age Concern</p>	<p>Energy Doctor service delivered by Age Concern in 2008-2010 helped over 850 households and the advice provided were estimated to have led to annual savings of &gt;£100 per home visited from their advice, and EE measures installed e.g. LED lights, draught proofing, setting of central heating</p>	Which other NGO's/Orgs could be involved?



	<p>run times, which for a project with total costs of less than £120k over 3 years. MU's Energy Efficiency officer has assumed most of the role taken by the former Energy Doctor and therefore has reduced the overall costs of delivering this service. In the majority of cases energy efficiency advice takes the form of increased thermal insulation whether improving loft insulation levels or possibly cavity wall insulation. Other third parties providing air tightness testing services will be in a position to provide additional support in respect of draft proofing, thermal curtains, etc. at minimum costs.</p>	
<p><b>An attractive package for householders</b> aligned to trigger points to incentive energy efficiency works</p>	<p>Trigger points include times such as when a home is sold or renovated. It is critical that this also includes removal of barriers which prevent occupants from bringing about the necessary action to improve the quality of the buildings they live and work in. Awareness of current energy performance of a property is low e.g. Home Energy Ratings are not required in the Isle of Man on sale of a home or change of tenure of a rented property. Current uptake of grants in the Energy</p>	<p>Increase incentives (grants) for home owners to increase take up energy efficiency works, e.g. remove income assessment element and provide 50% contribution. Also scope for IOMG to provide zero/low interest loans? Alternatively, engage a trusted partner with a budget to manage grants/loans on our behalf?</p> <p>Green Mortgages that enable lowering borrowing rates for more energy efficient homes might be worth considering</p> <p><a href="https://www.worldgbc.org/gr">https://www.worldgbc.org/gr</a></p>

	<p>Efficiency Scheme 2017 is very low. Grants are 75%, up to £250 per item and £1000 in aggregate towards measures. BUT requires an income assessment as to eligibility which has led to low return rate when application forms dispatched.</p>	<p><a href="#">een-mortgages</a></p> <p>In the scenario of people requiring help with completing forms, there would be scope for the Energy Doctor, or Local Libraries/Citizens Advice Bureau to assist.</p>
<p><b>A regulatory and support framework for low-carbon heating and energy efficiency?</b></p>	<p>Decarbonising homes by 2050 implies ensuring that by 2035 at the latest, all new heating system installations are low-carbon, see other work packages.</p>	<p>In order to develop supply chains, this will require signalling well in advance, alongside deployment of heat pumps at scale in the 2020s. Other options to be considered in the medium term are blending green gases in natural gas flows to residential households, hybrid HPs/gas boilers, localised district heating using Community Energy Centres comprising CHPs, Solar PV and battery storage; micro-CHPs, solar thermal, oil boilers using biofuels, etc.</p>
<p><b>Introduce Energy Performance Certificates</b></p>	<p>There is currently no requirement for an Energy Performance Certificate (as a measure of Energy rating), unlike England, Wales, Scotland and Ireland. All homes to be minimum EPC Band C at least, timelines to be confirmed. Isle of Man could achieve comparable</p>	<p>Bring forward any timelines for EPC banding/SAP assessments, and include Private Rented Sector. It is noted Scotland has set different band requirements and timelines for private rented sector, owner</p>

	<p>route via SAP ratings assessments, which also closely aligns with Building Regulation requirements and is also akin to approach taken in peer Crown Dependency of Jersey</p>  <p>Appropriate band should be modelled in the light of 2050 target and implementation lag. Also it might be better to set the bar low and lock in an escalator, as it allows people time to plan and invest.</p>	<p>occupier and social rented sector. Social having the highest standards. Should incentives be aligned with EPC levels e.g. discounts on Local Authority Rates based on EPC bands? Banning sale/renting out properties with an EPC below X?</p> <p>You may get households/properties becoming trapped and unsaleable/rentable if owners can't afford upgrades? An energy surcharge (tax) on sales of poor performing properties might be better, against which new owners can access grants for improvements?</p> <p>Likewise a tax on rental properties (which can't be reimbursed through higher rents)? In order to manage these risks the UK provided a number of exemptions available that safeguard these impacts</p>
<p><b>A training programme to upskill the existing workforce.</b></p>	<p>A properly skilled workforce is critical to enabling effective deployment of energy efficiency and low-carbon heating measures which perform as they</p>	<p>Bring forward timelines</p>

	<p>should.          New support to train designers, builders and installers is urgently needed for low-carbon heating (especially heat pumps), energy and water efficiency, ventilation and thermal comfort. There is a role here for Isle of Man College and their construction sector training opportunities. Relevant training can also be provided by HP manufacturers, and other Island based energy advice/renewable service providers – supported/ subsidised by Govt funding.</p> <p>Example NGO’s active in this sector should be approached – e.g. CAFS <a href="http://www.cafs.org.uk">www.cafs.org.uk</a> – (Carlisle Action for Sustainability) run training courses for tradespeople on how to improve and retrofit and insulate older housing stock.</p>	
<p><b>Energy Efficiency Awareness programme</b></p>	<p>Aimed at specific target audiences but mainly the public. Again, peer examples like CAFS <a href="http://www.cafs.org.uk">www.cafs.org.uk</a> – (Carlisle Action for Sustainability) have addressed this topic well, and which would be suitable to use as a</p>	

	reference.	
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## 5. THE COSTS AND RETURNS

Type of Project	Costs	Returns
<b>Re-establish Energy Doctor Service,</b>	Costs in 2008 - 10 were £120k, in staff costs and materials over 3 years	850 household contacts, annual savings were substantial at >£100 per intervention. Assumption being similar scope exists second time round, given project closed nearly a decade ago

- 5.1. Studies of energy efficiency schemes in the UK and internationally have linked household energy efficiency measures to wide ranging social, economic and environmental benefits. These include:
- Increased property values
  - Economic growth (through increased disposable income available and transitional construction sector jobs)
  - Reduced welfare spending
  - Improved mental and physical health
  - Improved employment opportunities
- 5.2. In recent UK studies, energy efficiency schemes are estimated to lead to returns of between £1.27 and £3.20 for every £1 invested (Cambridge econometrics, 2016).
- 5.3. In terms of the wider benefits of grants, studies in the UK found that depression and anxiety decreased by 48% following the installation of energy efficiency home improvement measures (APHO, 2019). A grant scheme to improve energy efficiency in the homes of people suffering respiratory disease in Sunderland led to a 28% reduction in GP appointments and 33% reduction in outpatient appointments required by residents of homes in the scheme (Burns, 2016).

Table 2 Examples and potential savings provided by the Energy Saving Trust include (Energy Saving Trust, 2019):

<b>Energy efficiency measure</b>	<b>Cost of installation</b>	<b>Annual saving</b>
draught-proofing of windows, doors and blocking cracks in floors and skirting boards	£200	£25
Room thermostat and thermostatic radiator valves	£300	£75
New gas boiler	£2,300	£560
Replace light bulbs with LEDs	£100	£35
Loft insulation	£395	£225
Cavity wall insulation	£720	£225
Solid wall insulation	External wall insulation: £8,000 to £22,000 Internal wall insulation: £4,000 to £13,000	£425
Insulating hot water cylinder	£85	£20

## 6. THE RISKS

- 6.1. Overall, improving energy efficiency of buildings is a no-regrets position to take. However, this would need to be split between new buildings (which can plausibly be designed to be net-zero emissions, e.g. Passive House concept) and how to improve the existing stock to reduce their emissions. There also needs to be an understanding that a proportion of buildings would remain very challenging to upgrade significantly given their limitations. Such limitations include buildings (including homes) with solid walls, those in conservation areas (which imposes additional constraints on what might be plausible to undertake) etc.

## 7. THE CO-BENEFITS (THE POSITIVE BENEFITS ASSOCIATED WITH THE CLIMATE ACTION)

- 7.1. There have been useful projects in the past that have delivered significant energy and financial savings for householders – and which are increasingly recognised as delivering significant carbon savings as a co-benefit. These carbon savings have

become ever more important, particularly so in the context of a Net Zero Greenhouse Gas Emissions by 2050 target. Additional benefits may include:

- Local resilience – buildings, heating and power
- wider sustainability benefits e.g. reduced impact from flooding, recycling, waste management, reduced water consumption/better management
- reduction in fuel poverty
- could stimulate local economy
- reducing cold related illness
- strengthen energy security.

## 8. CONCLUSION

- 8.1. Reducing emissions from buildings has a huge potential to reduce overall GHG emissions on the Island.
- 8.2. Establishing the energy efficiency of buildings on the island should be a priority given its status as single largest contributor to Greenhouse Gas Emissions figures.
- 8.3. Making homes more energy efficient will help to tackle fuel poverty and form part of a just transition to zero carbon.
- 8.4. The following initiatives are recommended:
  - An internet based Energy Advice Service, akin to UK Energy Savings Trust "Home Energy Check"
  - Re-establish Energy Doctor Service, via credible NGO such as Age Concern.
  - Establish a package for householders to incentive energy efficiency works. Widen the Manx Utilities Authority's Energy Efficiency officer's remit and commit to additional staff resources to create a team of 'energy champions' to support this initiative. Possibly also linking to Manx National Heritage and their skills and advice re older properties of which the Isle of Man has a high proportion, e.g. 10,000 solid wall homes.
  - A regulatory and support framework for low-carbon heating, e.g. introduce Energy Performance Certificates/SAP ratings to identify clear energy usage implications of a property and help to identify potential improvement options
  - Government or Island banks funded ESCOs could deliver energy costs savings effectively amongst the residential community.
  - Launch an energy advice / support scheme on back of SAP (energy ratings for buildings) launch in January 2020 to coincide with new revisions for building regulations.
  - A training programme to upskill the existing workforce.

- Appropriate energy efficiency advice/training given to social landlords to help their tenants reduce energy costs and ensure rented properties achieve a high level of SAP. EPC ratings for rented properties would provide guidance to prospective tenants on their future energy running costs.

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