Committee on Fuel Poverty

Committee on Fuel Poverty's recommendations on commissioned research: *Better use of data and advanced statistics/machine learning in delivering benefits to the fuel poor*

The Committee on Fuel Poverty acknowledges with thanks the report on its commissioned research, undertaken by Deloitte LLP into the *Better use of data and advanced statistics/ machine learning in delivering benefits to the fuel poor*.

Whilst we had identified that advanced statistics/machine learning (henceforth referred to using the broad term AI), has the potential to help improve the ability to identify fuel poor households, (who could benefit from assistance to improve the energy efficiency of their homes), we wished to understand the barriers to building AI into government policies.

The researchers selected case studies in four countries (UK, USA, Portugal and Switzerland) to identify examples of best practice in overcoming barriers to implementing AI in the delivery of government schemes. We are pleased that the findings showed, in this small sample, that there were no major barriers to implementing AI in policy delivery. This report also shows that the use of AI has potential to improve the effectiveness and efficiency of delivering the fuel poverty strategy for England[1]. The research uses a hypothetical example (in this case an example based on the Energy Company Obligation), which shows that there are potential benefits of over Net Present Value (NPV) £100 million.

To date, it has proven difficult to identify the estimated 2.4 million households who are in fuel poverty. As a result, the £2.5 billion per year budgets of schemes designed to help fuel poor households, base their targeting on proxies such as those who are in receipt of state pensions or benefits. This has resulted in low efficiencies in targeting with only between 10% and 30% of assistance being received by fuel poor households.

The £640 million per year Energy Company Obligation Scheme (ECO)[2] is the largest energy efficiency scheme in Great Britain. However, of the ECO spend in England, only circa 30% of its energy efficiency measures are forecast on fuel poor households. Although a design with a tighter focus on fuel poor households had superior economics of NPV £383 million (ECO3 Consultation Impact Assessment) [3], it was rejected due to cost concerns associated with difficulties in finding households, for assistance, in small target locations.

[1] Cutting the cost of keeping warm - A fuel poverty strategy for England: https://www.gov.uk/government/publications/cutting-the-cost-of-keeping-warm
[2] Energy Company Obligation Scheme (ECO) – statistics: https://www.gov.uk/government/collections/household-energy-efficiency-national-statistics
[3] ECO3 2018-2022: www/government/consultations/energy-company-obligation-eco3-2018-2022

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The Committee for Fuel Poverty believe that the recommendations in this report, if implemented, could significantly improve the targeting efficiency, and lower the cost of the ECO scheme. We support the work BEIS is currently doing to improve the targeting capability of fuel poverty programmes through the development of statistical models, including making use of data made available by the Digital Economy Act[4].

Committee on Fuel Poverty Recommendations:

1. Given the potential large financial benefits from improving the targeting of assistance to fuel poor households, **BEIS should commit resources to move forward the use of advanced statistics/machine learning (termed broadly as AI) as a matter of urgency**. We would recommend that BEIS initially focus on improving the targeting capability of the successor to ECO in 2022 to allow the use of AI. It should be noted that as we are starting from a 30% efficiency in ECO, use of AI should be implemented as soon as a reasonable level of modelling accuracy is achieved. It can be enhanced at a later stage and become more accurate as new data sets become available e.g. Smart Meter data. As confidence is built on using AI to improve the successor to the ECO scheme, work should continue in parallel to improve the targeting efficiency of the Warm Home Discount scheme.

2. To ensure that there is a collective understanding of the issues raised**, the report should be widely circulated across multiple government departments.** This includes those who have an interest in improving ECO's targeting efficiency on the fuel poor or whose cooperation would be needed in embedding the best practice use of AI in government policies, such as the Department for Work and Pensions, Department of Health and Social Care, the Ministry of Housing, Communities and Local Government and HM Treasury.

3. **BEIS should maximise the input from other stakeholders**. In addition to other Government departments, the private sector and the third sector should be included. This will maximise the opportunity for knowledge sharing as BEIS develops and implements this targeting methodology. To this end the CFP will assist by disseminating and sharing this research and our recommendations more widely at workshops and partner events to reach out to others for their cooperation to drive this agenda forward.

[4] Digital Economy Act 2017: https://www.gov.uk/government/collections/digital-economy-bill-2016

4. **BEIS should develop a governance framework for using AI to better target fuel poverty schemes**, including the legal and ethical aspects that need to be considered. Involvement of third parties would ensure there is sufficient oversight and appropriate challenge.

Background

The fuel poverty strategy for England[1] has a legally binding 2030 target to upgrade as many as is reasonably practicable fuel poor homes to an energy efficiency rating of Band C. It has two intermediate milestones to upgrade as many fuel poor homes as is reasonably practicable to Band E by 2020 and Band D by 2025.

The Low Income, High Cost metric used to calculate the number of fuel poor households in England is based on households meeting two relative criteria:

- 'Low Income' - an adjusted household income after tax, housing and energy costs that is below the poverty line - 60% of median income level; and
- 'High Cost' - has higher than typical (median) energy needs.

When designing schemes to improve the energy efficiency levels of fuel poor homes and help them to pay their energy bills, the fuel poverty strategy guiding principles should be used: prioritisation of the most severely fuel poor; supporting the fuel poor with cost-effective policies; and reflecting vulnerability in policy decisions. Statistically, it is possible to calculate that there are circa 2.4 million fuel poor households in England. However, to date schemes designed to help fuel poor households have low efficiency as it has been difficult to match up data on individual households to identify exactly where they live (due to legal, ethical and practical challenges).

The main problem with the existing schemes is that they rely heavily on using receipt of benefits as a proxy for 'fuel poor'. Fuel Poverty Statistics[5] show that only 47% of fuel poor households are in receipt of benefits and, therefore, out of a total spend of circa £2.5 billion per year cost for the Energy Company Obligation, Winter Fuel Payment and Warm Home Discount schemes, only about 15% of benefits are received by fuel poor households. There are therefore substantial potential economies to be made if targeting efficiencies on fuel poor households can be improved.

[5] Fuel Poverty Statistics: https://www.gov.uk/government/collections/fuel-poverty-statistics

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The Committee on Fuel Poverty welcomed the introduction of the Digital Economy Act 2017 as it provides the opportunity to access data from across a wide range of Government data sources. This additional data could be used to help identify the location of individual households in fuel poverty. However, to date, the three main schemes have made limited use of the additional available data.

Some effort has been made to engage local authorities in helping to identify fuel poor households who are not in receipt of benefits in the 'ECO Flex' scheme. This scheme allows local authorities to identify households to enable energy companies to install energy efficiency measures in up to 25% of their obligations. However, to date there is no data to show that this scheme is actually helping to identify fuel poor households in England and there is some data that shows that it is actually reducing the targeting of assistance to fuel poor households.

After talking with third parties, we became convinced that the combination of improved access to Government data from the Digital Economy Act, combined with using AI could significantly improve the identification of individual households in fuel poverty. We therefore welcomed the work that BEIS has commenced to develop an AI model and we understand that the accuracy of the model is nearing where it could be utilised in the successor to the ECO scheme. This will help to identify more owner-occupied fuel poor households for assistance to improve the energy efficiency levels of their homes.

As the use of AI in Government schemes is a fairly new concept, we therefore recommended commissioning additional research into investigating examples of global best practice on how barriers can be overcome using advanced statistics/machine learning methodology and introducing this into Government fuel poverty programmes.

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