

# Theory Based Evaluation: Practical Experience from the UK Capacity Market

*Elizabeth Steele, DNV GL, London, UK*

## Abstract

The UK Department of Energy and Climate Change (DECC) has established an auction based Capacity Market to encourage investment in new generating capacity with the first auctions held in 2014. Initially up to £20m was allocated for a pilot scheme to test whether Electricity Demand Reduction (EDR) might be viable within the Capacity Market. A consortium led by DNV GL is conducting a five-year evaluation of the EDR pilot that will be closely integrated with the ongoing delivery of the programme. This will enable DECC to draw on insight during the pilot to support the development and design of a permanent programme. The evaluation is using a theory-based approach to:

- Determine whether EDR is viable in the Capacity Market
- Learn lessons for government and wider stakeholders on delivery of EDR schemes; key areas of interest include:
  - The influence of the subsidy on organisations' behaviours;
  - The extent to which EDR savings are additional to what would have happened anyway;
  - Mechanisms by which aggregators might be attracted into the market to deliver EDR at smaller sites; and
  - Whether energy efficiency can deliver reliable reductions in peak demand.

This paper will describe three aspects of the evaluation:

- The theoretical framework and how it was developed; identifying how the “black box” theory of change was opened up to identify assumptions and possible alternative explanations.
- The early evaluation findings from the first auction of the pilot and how they have been used to inform the development of the pilot's second auction.
- How theory based evaluation will be used to assess additionality – considering the programme's contribution to investment in energy efficiency, peak demand reductions and changes to behaviour in organisations.

## Introduction

The UK Department of Energy and Climate Change (DECC) established a Capacity Market with the first auctions in 2014. The goal of the Capacity Market was to increase the security of electricity supply for an electricity market that will increasingly rely on distributed and intermittent generation sources (wind, solar) and inflexible nuclear. The Capacity Market was a main component of the UK government's Electricity Market Reform programme (Ofgem, 2016). Auctions take place annually, for delivery four years later. (So the first auction in 2014 was for delivery year 2018/19.) Successful bidders receive predictable payments that encourage investment in new generation or continued operation of existing generation resources. Demand Side Response is also eligible. The auction is run as a pay-as-clear auction and bid prices start at £75/MW and decrease until the required capacity is reached. This ‘cut off point’ represents the cleared price that sets capacity payments for all successful bidders. (National Grid, 2016.) A “year ahead” auction is run to secure any further capacity required one year before the delivery year.

DECC is investigating if energy efficiency resources can participate in the Capacity Market. Initially up to £20m was allocated for a pilot scheme to test whether Electricity Demand Reduction

(EDR) might be viable within the Capacity Market. (Although currently the EDR scheme has auctions separate from the rest of the Capacity Market.) The EDR programme tests if reliable and lasting peak<sup>1</sup> demand reductions can be delivered by energy efficiency projects.

DECC launched the first phase of the EDR Pilot Scheme in July 2014, with applications due in October 2014 and the first auction held in January 2015. There were a number of successful bidders who signed participant agreements in February 2015, and their peak demand reductions are contracted to be realised over the winter 2015/2016 period. DECC launched the second phase of the EDR Pilot scheme in June 2015, with the auction in January 2016 and peak demand reductions expected over the winter 2016/17 or winter 2017/18 periods.

DECC has contracted a consortium led by DNV GL to evaluate the EDR pilot. The goal of the pilot is to examine the feasibility of EDR in the capacity market and to learn lessons for Government and stakeholders regarding the EDR scheme. The EDR pilot is an innovative approach to peak demand reduction, and as such, DNV GL is taking a relatively unique approach to its evaluation.

## Evaluation Methods

There are many methods for estimating the impact of programmes. The most rigorous ways to quantify the generally involve some form of a randomised control trial with a treatment group (or groups) and a non-treatment group (or control). These trials are often preferred as they avoid multiple sources of bias (especially in blind studies). (Sedgwick, 2012.)

However these traditional methods such as randomised control trials are often not possible to use in reality, are expensive to implement, and lack descriptive power to explain how the intervention is working. The EDR pilot scheme is a good example of these limitations. the population of participants is quite small, we are not able to randomly assign participants to treatment groups as they self-select their “treatments” and participants volunteer from a heterogeneous population. Therefore it is difficult to create a rigorous control group.

Additionally, the evaluation is interested in more than just quantifying the impact on peak savings – it seeks to know why the scheme works (or doesn't) and for whom. It is also important to the client that the findings are generalized, to suggest what *might* happen in an enduring regime. Therefore, instead of using statistical inferential and counterfactual frameworks to impact evaluation, a generative causation approach is used. (Stern, 2012.) The evaluation combines multiple theoretical and analytical methods to provide evidence on how and why the EDR scheme influenced organizations.

## Qualitative Comparative Analysis and Process Tracing

The overall evaluation approach has been informed by realist evaluation and theories of change, where the hypotheses on what factors contributed to observed outcomes have been built and tested. (Tilley and Pawson, 2004.) In this sense, the evaluation includes both process and impact assessments. This paper focuses on the following key methods:

- Qualitative comparative analysis (QCA). This is a statistical tool for determining what logical conclusions are supported for a given data set. Its works by defining and comparing various configurations and if they contribute to an outcome of interest. (Baptist and Befani, 2015; Rihoux, 2009; Schneider 2009.)
- Process tracing. This method aims to make causal inferences and evaluate casual claims. The goal of this method is not to measure exact impact but rather increase our confidence that the intervention had an impact (or did not, as the case may be). (Collier, 2011.) This is a

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<sup>1</sup> Peak is defined as 4pm to 8pm on winter weekdays.

mechanism for testing how the EDR Pilot scheme and other influences might have influenced the conditions that lead to a reduction in peak demand. This explores the role of causal contexts and their combinations in individual cases and compares these roles to those hypothesised by the theoretical framework and the QCA.

Together, these methods were used to test the contribution story and theoretical framework developed by the evaluation team.

## Theoretical Framework

Theory based evaluation is an iterative process and works closely with the implementation of the policy being evaluated. Its main purpose is to determine if the programme theory is valid. This evaluation does not look at programme success as a yes or no question, rather it asks “what works for whom in what circumstances and what respects, and how?” (Tilley and Pawson, 2004.)

This can provide timely evaluation insight to the policy’s implementation team and to can ensure that evaluation activities develop with increased understanding of how the policy works for different organizations with different contexts. The general evaluation process is:

1. A theoretical framework is developed to describe the original intent of the policy in question.
2. An evaluation framework is developed to test the original intentions of the policy.
3. The learning from the evaluation is used to revise the theoretical framework. The evaluation framework is also revised to include any new or modified questions.
4. Further evaluation activities and associated revisions are conducted to continue to improve the theoretical framework.

The central hypothesis for DECC’s EDR programme states that organizations are motivated to implement EDR by the following:

- The subsidy that is available under the EDR Pilot scheme.
- The Government’s endorsement of EDR.
- The ease of implementing EDR.
- The development of an aggregator market.
- Aggregators are expected to implement EDR projects to engage in a potentially profitable market.

The evaluation’s theoretical framework presents the theory of change according to the five stages of the pilot, which is summarized below.

1. DECC promotes the scheme to organisations, including aggregators; they will become interested in electricity demand reduction and register with the scheme. Registrations will be received from a diverse range of potential direct participants and aggregators.
2. DECC provides guidance to organisations that have expressed interest. A diverse range of direct participants develop projects for a range of technologies and submit applications for the scheme. Aggregators develop business models and submit applications for the scheme. Awareness of both the concept of EDR and the EDR Pilot scheme increases in organisations along with the interest of senior management and the capacity of energy managers to implement projects.
3. DECC reviews applications and supports applicants to develop qualifying projects, applicants refine their applications and re-submit with the aim of pre-qualifying for the auction. Organisations that do not proceed in the EDR Pilot scheme may be motivated to implement EDR or energy efficiency projects regardless.
4. The auction is held and successful bids are received from a diverse range of direct participants, for a range of technologies. Successful bids are received from aggregators.

Losing bidders implement EDR projects outside the EDR Pilot scheme anyway. DECC negotiates with successful bidders and contracts are signed.

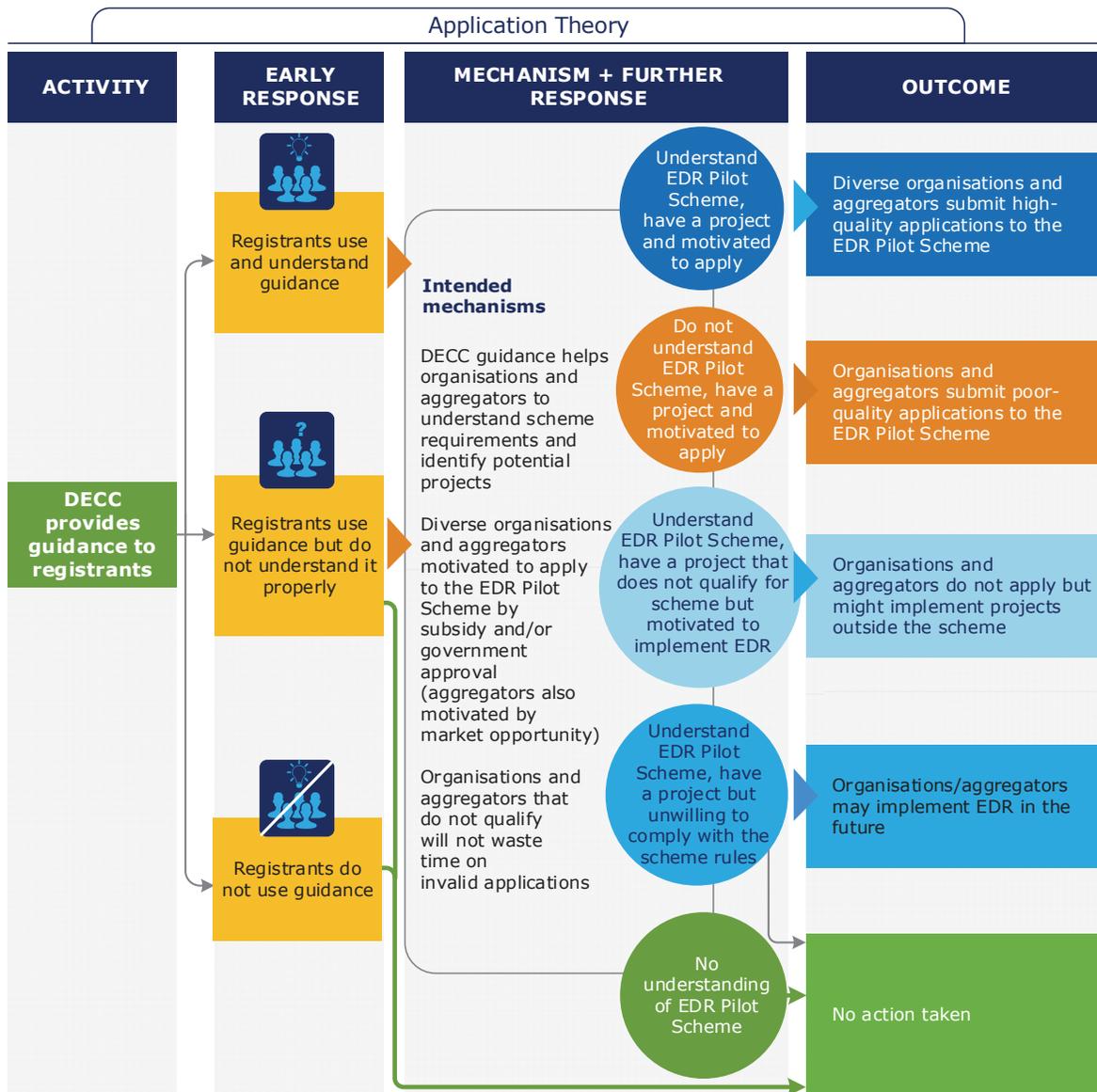
5. Contracted participants submit a final measurement and verification (M&V) plan which fully details their planned project. Projects are installed and confirmed via the Operational Verification (OV) reports. The projects then operate delivering reliable additional peak savings, energy savings and non-energy benefits. An aggregator market develops delivering EDR, which is able to bring forward more savings including from homes and smaller organisations. Direct participants recognise the value of EDR and implement more projects in the future.

Each stage of the theoretical framework includes a hypothesis about how the mechanisms act within an organisation, the context in which the mechanism will ‘fire’, and the observable outcomes if it does. This combination of context, mechanism and outcome (CMO) forms the hypotheses and alternative hypotheses we will test in the evaluation.

The evaluation team has created diagrams to graphically represent the theoretical framework at each of the five stages outlined above. Where organizations/aggregators take action within the scheme, the outcomes at each of the five stages are expected to be: registration, application, pre-qualification, contract and delivery. For each stage, the diagram presents:

- The activity which is intended to motivate the target populations to implement EDR.
- How the activity is intended to motivate (the mechanism). This is what the evaluation will test.
- Potential unintended mechanisms and risks.
- Other possible outcomes. This should not be viewed as an exhaustive list and the evaluation may identify additional outcomes as it progresses.
- Contexts which are thought to be relevant to the operation of the mechanism. Again, this cannot be an exhaustive list and the evaluation may identify additional contexts or establish that some of those listed are not relevant.
- Potential alternative explanations for consideration in the evaluation. This is also not an exhaustive list.

The evaluation team has created theoretical framework diagrams for each step of the programme. An example is shown below for the application stage (**Figure 1**). For brevity, diagrams for other steps of the programme (1 and 3-5) are not presented here.



**RISKS/UNINTENDED MECHANISMS**

DECC guidance ineffective in increasing understanding; organisations do not apply for qualifying projects or apply for non-qualifying ones.

Organisations deterred from implementing EDR through EDR Pilot Scheme by scheme rules and requirements.

Organisations deterred from implementing EDR through EDR Pilot Scheme by scheme timeline.

**DECC provides guidance** to organisations and aggregators that register with the EDR Pilot scheme. Some use the guidance to progress in the scheme; others do not and do not proceed further with the EDR Pilot scheme.

The guidance is intended to assist organisations and aggregators to understand the scheme requirements; the mechanism could fire in several ways depending on the context, leading to different outcomes:

- Some organisations and aggregators will continue to be motivated to implement EDR through the scheme; they will understand what they need to do and believe they are capable of meeting the scheme requirements. Thus, potentially securing the subsidy/government endorsement. They will submit high quality applications to the scheme.
- Other organisations and aggregators will remain motivated to implement EDR but determine that

**HYPOTHESES ABOUT CONTEXTS:**

1. Large organisations and those with a commitment to energy efficiency are the most likely to have the resources to apply within the time limit.
2. Aggregators will not apply unless they can identify a market opportunity (although they do not need to have identified specific customers) at this stage.
3. Organisations' interest in the EDR Pilot Scheme will be influenced by the technologies they use in their business
4. If the rules are too restrictive some potential applicants will be deterred from applying.
5. Organisations that already have a potential project are likely to apply but the project may not be additional.
6. Some potential applicants will be deterred by the risk and complexity associated with the auction process or the scheme rules.
7. The M&V requirements will deter some applicants and may exclude some technologies.
8. The scheme rules and timelines are most likely to deter smaller applicants.

**POTENTIAL ALTERNATIVE EXPLANATIONS**

Applicants motivated to implement energy efficiency by cost

<p>they do not have projects that would meet the scheme requirements. They may or may not progress EDR projects outside the scheme.</p> <ul style="list-style-type: none"> <li>• A further group of organisations and aggregators will be motivated to implement EDR and will have projects that could have met the scheme requirements but are unable or unwilling to comply with the EDR Pilot scheme rules. They may or may not progress EDR projects outside the scheme.</li> <li>• A fourth group of organisations and aggregators have gained an understanding of EDR and may be motivated to implement projects at some stage in the future.</li> <li>• Organisations and aggregators may decide that EDR is not appropriate for them.</li> <li>• Finally, some organisations and aggregators may misunderstand the scheme requirements and either proceed with projects that will not secure support or abandon projects that would have secured subsidy.</li> </ul>	<p>savings, non-energy benefits, reputational benefits and other government policies (e.g. CRC, ESOS).</p> <p>Applicants may already have energy efficiency projects planned and will implement them.</p>
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**Figure 1.** EDR Pilot Scheme Evaluation Theoretical Framework – Registration Stage

A theoretical framework is fundamental for many of the planned analysis techniques that establish whether the hypotheses operate in practice. Specifically:

- The mechanisms by which the EDR Pilot scheme motivates, or fails to motivate, potential participants
- How specific contexts that apply to potential participants affect the outcomes
- Rival hypotheses that may explain the observed outcomes.

The results of QCA and process tracing will allow the evaluation team to assess whether the evidence supports the central EDR Pilot scheme hypothesis, a rival hypothesis, or some combination of hypotheses. The evaluation team will explore if the intended outcomes have occurred, and if so, identify the casual factors that led to these outcomes and if the factors were necessary and/or sufficient. The team will establish the role that the EDR pilot played in the outcomes observed and refine the theoretical framework as necessary based on the findings.

**Data Collection**

The evaluation team interviewed a number of phase 1 participants, drop outs and non-participants to learn more about their organizational characteristics and their EDR journey. The team also utilized data from EOIs and applications. The team was specifically interested in organisations that took energy efficiency projects forward – both inside and outside the scheme.

Interviews addressed a number of topics and varied based on interview group (participant, drop-out or non-participant). Interviews provided data on the following topics:

- Motivation for utilising the EDR scheme (or not).
- Experience of the EDR scheme, including application process, measurement and verification, DECC reporting and review, payment process, etc.
- Influence of the scheme on the project.
- Additionality and what participants would have done in absence of the scheme.
- Confirmation on installation dates, equipment numbers and types, project costs and savings.
- Organisational characteristics like sector, size, type of organization (direct participant or aggregator), energy consumption, energy strategies, etc.
- Non-energy benefits realised as a result of demand reduction projects.

## Analysis

### Qualitative Comparative Analysis

Initial QCA found many combinations of conditions that resulted in participation. However, the team determined that many of these were essentially eligibility factors that would be true of most organisations that DECC invited to participate. Therefore, the team combined these eligibility factors into a single condition to use in QCA. QCA highlighted a number of conditions that, when present together, led to participation in the EDR scheme:

- Being eligible
- Having adequate time to spend on the scheme process
- Having a pre-existing project at the right stage for inclusion
- Having organisational Corporate Social Responsibility (or CSR like) policies

While the combination of all of these conditions was necessary to achieve the desired outcome (participation in the scheme), it was not *sufficient* in predicting participation, as the combination was also present in a non-participant. However, it should be noted that this combination of conditions is still important, as all of these conditions were only present in a single non-participant but present in all participants.

### Process Tracing

Process tracing assessed evidence for the hypothesis that 'EDR contributes to a reduction in peak demand'. The evaluation team used interview results and four specific causal tests to assess this:

- **Organisation implements a project that reduces peak demand within EDR or outside the scheme.** This was a 'hoop test' (Collier, 2001), the absence of this would greatly reduce the likelihood the scheme had delivered peak savings. All participant organisations passed this test. However, this does not address additionality; organisations could deliver projects that would have gone forward even without the scheme.
- **The financial benefit from the EDR scheme makes the project financially viable.** This was a 'smoking gun' clue (Collier, 2001), if proven correct than the hypothesis was strengthened. Very few participants passed this test, as many reported they could have financed the project internally if needed.
- **EDR accelerates action by providing finance or fixed deadlines for completion to qualify for funding.** This was also a 'smoking gun' clue. Many participants passed this test; they reported that without EDR projects would have happened later and would have taken longer. However, for organisations where the project would not have happened without EDR funding, acceleration was by definition not explored.
- **Changes are made to projects to make them 'more peaky' to ensure qualification for EDR.** This is another 'smoking gun' clue. If proven, it greatly strengthened the hypothesis, but it was recognised that there may be limitations for organisations in further expanding a project that was already delivering savings across the Winter Peak period anyway i.e. it may not have been possible to make the existing project 'more peaky'. Few participants passed this test, though others stated that their projects were 'more peaky' in the sense that EDR encouraged implementation of multiple projects in one go rather than the piecemeal implementation over a longer period.

Overall, the scheme was felt to have an influence on the majority of participants, mostly in the form of project acceleration. This supports the hypothesis that ‘EDR contributes to a reduction in peak demand’.

### **Assessing Additionality**

An important goal of the evaluation is to determine the proportion of outcomes that are directly attributable to the EDR pilot. The team will evaluate scheme and evaluation data for each participant to determine what portion of the project’s outcomes are the result of the pilot. To this end, participants are asked about the following:

- Where the idea for their project originated, and if it was before or after learning about the EDR scheme.
- If the project was developed specifically for EDR.
- If the project was pre-existing, how it had changed (if at all) to fit within the EDR scheme.
- If the project was pre-existing, what about it made it suitable for the EDR scheme.
- Without EDR, would the project have been implemented? If yes, how the timescales or scope would have changed.
- If they are affected by peak electricity demand constraints on the transmission or distribution network.
- If the EDR scheme heightened their awareness of peak constraints.
- If they had implemented similar projects in the past. If yes, how did this project compare?

Additionally, non-participants and drop-outs were asked if they have a project that is going forward outside of the scheme. If they did, they are asked the following:

- Project details, such as technology, electricity and cost savings, installation timeline.
- Where the idea for their project originated, and if it was before or after learning about the EDR scheme.
- If the project was developed specifically for EDR.
- If the project was pre-existing, if the EDR scheme had resulted in any changes.
- If the project was pre-existing, what about it made it a potential project for the EDR scheme.
- If the project was pre-existing, how far along was it when they heard about EDR.
- If they are affected by peak electricity demand constraints on the transmission or distribution network.
- If the EDR scheme heightened their awareness of peak constraints.
- If they had implemented similar projects in the past. If yes, how did this project compare?

The contribution story for each participant will be analysed – is it plausible? Is it consistent with the theory of change? It is possible that only partial additionality will be observed for some participants. Possible outcomes may include:

- Projects that would not have happened at all without the EDR pilot. In this case, all outcomes are considered additional.
- Projects that were conceptualized before the EDR pilot but were modified in some way to take advantage of the scheme’s subsidy. For example, this may include projects where a participant increased the size of the project to meet the kW threshold. The outcomes that could be considered additional would be the total observed outcomes less what would have happened in the original project design.
- Projects that were conceptualized before the EDR pilot but were accelerated to meet the required timelines. The outcomes that could be considered additional would be the total observed outcomes between installation and when the project would have happened anyway.

- Projects where EDR is one of a number of contributing factors. Here the maximum attributed amount should be the share of the funding paid by EDR. This could be less depending on how important the role of EDR was.
- Projects where EDR did not make a difference no savings would be attributed.

The team will develop a contribution factor for each case studied, based on the guidelines above. For some cases, the contribution factor may take into account a number of the above guidelines. An example would be an organization that added 30 kW of additional equipment to meet the 100 kW threshold and accelerated their project by 7 months so that it was complete before the 2015/16 winter period. In this case, both the 30 kW of extra capacity and the extra 7 months of electricity savings are attributable to the project.

These will be combined to determine an overall contribution factor for phase 1 of the EDR scheme. This additionality analysis will produce both total observed outcomes and the percent of those outcomes directly attributable to the EDR pilot. The evaluation will also look at how the EDR pilot raised awareness of winter peak and the associated constraints on the electric grid for both participants and non-participants. All of this will allow the evaluation to answer the following questions related to additionality:

- Are reliable and additional peak savings delivered by the scheme?
- Through what mechanisms did EDR contribute to the outcome?
- For whom and under what circumstances did EDR provide additional peak savings?
- What features of the pilots design and implementation contribute to these results?

Since the kW savings from participant projects have not yet been finalised, we are unable to determine exactly how much the additional peak reduction will be. However, the team did note the following:

- Many organisations had pre-existing plans for energy efficiency projects.
- Many organisations accelerated their projects to fit within the EDR timelines and therefore be eligible for the EDR subsidy.
- A few organisations made the scope of their projects larger to fit within EDR requirements (100 kW threshold).

## **Early Evaluation Findings**

DECC intended the EDR pilot to appeal to a wide variety of organizations, and initially, it did. Almost 1,000 organizations from a wide variety of sectors reached out to DECC for additional information on the first phase of the scheme, and many of them submitted an Expression of Interest (EOI). Out of those that submitted applications in phase 1, aggregators and education organizations had the lowest number of applications while commercial organizations had the highest. Interest and participation in phase 2 is yet to be evaluated.

## **Direct Participants**

Organizations that successfully submitted an application were more likely to be large, energy intensive organizations with prior energy efficiency experience. These organisations display organisational and management practices that suggest they were already familiar with energy efficiency and its benefits. Out of the direct participants, successful bidders were also most likely to be commercial organizations, while education and healthcare sectors were the least common.

## **Aggregators**

The EDR scheme is best suited for organizations with a large potential for demand reduction. This means smaller organizations may not have high enough electricity demand on their own to meet the eligibility threshold (100 kW in phase 1). DECC intended to utilize aggregators to “unlock” the potential energy savings from smaller participants by bundling projects together to bid into the scheme (and also to manage the delivery risks for individual participants). The EDR scheme is well aligned with the goals and business interests of aggregators and participation could theoretically increase their competitive edge in the market. Despite a high level of interest and motivation, aggregator drop out was quite high in phase 1. There is great potential for aggregator growth in the scheme.

## **Technology Types**

Initially, applicants considered a wide range of technologies for the EDR scheme – lighting, HVAC, motors and drives, controls and refrigeration measures. Projects were proposed in both industrial and commercial sectors. However, the majority of projects that progressed through the first auction and into the installation phase were LED lighting projects in commercial or industrial facilities. This is likely due to a variety of reasons:

- The simplicity of lighting projects fit better with the accelerated timelines of the first phase.
- Lighting upgrades can be thought of a ‘low hanging fruit’ as they are relatively inexpensive and simple projects to design and install.
- Lighting utilized a deemed spreadsheet based M&V approach. Other technologies that utilized similar deemed spreadsheets included motors, controls and refrigeration measures.
- The scheme, as a pilot, was new for all applicants. It is not unreasonable for participants to pick simple projects to “test” out a pilot programme, since they do not have past EDR experience to draw on. It’s possible that the complexity of EDR projects will increase as the scheme matures.

## **Scheme Design and Impact**

In the interviews, participants and non-participants cited certain aspects of scheme design as barriers. Common observations were:

- Short application timelines. (The scheme was formally announced in June 2014 and applications were due 31 October 2014.) Potential projects in phase 1 needed to be defined in advance and the application needed to include M&V plans and projected savings. Designing a project in the five months available could be problematic.
- The auction format created uncertainty around gaining funding. Many organizations felt the auction would be highly competitive and therefore funding would be low. (Although it should be noted this is a key design feature as an auction helps to create the most value for money for society.)
- The 100 kW threshold for projects. Smaller organizations had trouble creating projects this large.

## **Phase 2 Changes**

Changes were made to the communication strategy as well as the design of the second phase in order to encourage greater participation and higher quality applications. As a result of the initial findings, the EDR pilot was revised in the following ways:

- The minimum project size was lowered from 100 kW to 50 kW.
- More time was allowed for delivery. Projects can choose delivery in winter 2016/17 or winter 2017/18.
- Projects did not have to be wholly defined upon bidding. Up to 40% of savings could be determined at a later date.
- M&V requirements have been simplified. Participants can choose to bid fewer kW reductions than the savings reported in their M&V documents<sup>2</sup>.
- DECC committed to additional support through the application process.
- An upfront payment of 20% was made available at the Operational Verification stage, with 60% payment at Winter Capacity Savings Report stage, and the remaining 20% payment after all requirements are met (all 3 payments are contingent on delivery of savings).

These changes have the potential to encourage participation from a wider audience by removing or lessening the following potential barriers:

- Minimum kW threshold. The lower threshold of 50 kW for phase 2 allows for smaller organizations and/or smaller projects to participate. This also means organizations can progress projects that require less capital and may therefore be viewed as lower risk.
- Timescales. The aggressive timescales during the phase 1 process was challenging; allowing for two winter delivery periods allows aggregators and direct participants more time to develop projects and source suppliers.
- Flexibility. Allowing for up to 40% of savings to be determined at a later date means organizations have more time to develop projects and allows for changes that may happen during the planning process.
- Complexity and M&V requirements. DECC's additional support through the application and M&V process gives organisations additional resources and clarity.
- Capital constraints. The revised payment schedule means that organizations can get a portion of their incentive payments sooner.

These changes were expected to increase the number of successful participants and make participation simpler.

## Conclusion

The changes made to EDR for Auction 2 sought to address some of the main concerns that drop-outs and non-participants cited as barriers. It was hoped that these changes will encourage more participation and a more diverse selection of projects, and the initial results of Auction 2 show higher participation numbers than the first auction. There were more participating organizations and there were more non-lighting projects that applied for the scheme.

The evaluation team will continue to work closely with programme implementation staff at DECC and collect evidence that can be used to further refine the theoretical framework. This research will allow the evaluation team to determine the viability of EDR in the capacity market, to collect 'lessons learned', and to determine what actions can be considered additional and direct attributable to the EDR programme. This will enable DECC to draw on insight during the pilot to support the development and design of a permanent demand reduction programme that meets the needs of both DECC and consumers.

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<sup>2</sup> Some phase 1 participants were worried about hitting their proposed savings exactly; this allows them a buffer if they "underbid" the savings in the M&V.

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