



Department for  
Business, Energy  
& Industrial Strategy

# Non-Domestic Smart Energy Management Innovation Competition

Evaluation case study: Untapped

## Acknowledgements

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# Executive summary

This report describes findings and lessons from the pilot of 'Untapped', a tool using smart meter data to facilitate energy management and energy savings in schools. Untapped was piloted by Hoare Lea as part of the UK Government's Non-Domestic Smart Energy Management Innovation Competition (NDSEMIC). Untapped is an online dashboard which displayed electricity and gas use at half hourly intervals, producing reports for users to monitor consumption. It was piloted across 49 schools.

Overall, Untapped did not achieve the engagement expected amongst users piloting the tool. Very few participants had accessed or used the tool and amongst those which had, only one consulted have found Untapped beneficial. Pilot participants consulted had not benefitted from Untapped, either because they had existing energy management systems in place, which they preferred, or because they found that Untapped did not meet their needs. Subsequently, the evaluation has a low level of confidence that Untapped contributed to any energy savings at pilot sites.<sup>1</sup> However, this does not preclude the tool from working in the future, if some adjustments / lessons learned are taken on board.

The factors which seem to have limited Untapped's success within schools are:

- A lengthy and complicated 'onboarding' process and unanticipated difficulties in engaging schools. In total 49 schools piloted the tool, though several were onboarded later than anticipated and engagement amongst the 49 schools was a challenge (see rest of report).
- Some technological challenges linked to the metering arrangements in schools created delays which impacted on the consortium's stakeholder engagement activities.
- A lack of engagement of teachers and pupils and low awareness amongst potential users of the tools' complementary educational package of lesson plans and resources, which could have increased uptake and use within schools.

The findings from this report suggest that Untapped could take forwards the following points as it progresses its offer, which may also be relevant for other innovators:

- Provide 'live' data<sup>2</sup> and offer more granularity (e.g. per room, per appliance/ equipment) – the tools preferred by users consulted for this evaluation were offering this information.
- Explore how it may be possible to incorporate effective induction and ongoing support within a commercial offering, e.g. through improved induction materials (such as videos) and partnerships with environmental or other organisations which may be able to provide ongoing support

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<sup>1</sup> This is the conclusion reached from applying the evaluation's strength of evidence framework (see Chapter three). This framework triangulated various quantitative and qualitative data sources to give a level of confidence that savings had been achieved in some pilot sites..

<sup>2</sup> Live data in the context of this Competition describes energy consumption data at half hourly (or more detailed) granularity fed to the tool or platform on an on-going basis. Non-live data may provide the same level of granularity but is not updated on an ongoing basis, for example being uploaded to the tool or platform once a day (and in arrears).

- Maintain the visual presentation of the Untapped dashboard. Users remarked positively on the colour-coded information and simple 'pass/fail' system that enabled them to easily identify when their energy consumption was high.
- Better promote the complementary educational resources, as the findings from the evaluations of other Competition tools have suggested that such resources are a 'deal-breaker' to take-up within schools and users of Untapped also indicated that they would have liked to have had better access to these resources.

# 1 Introduction

This report describes the findings and lessons from the evaluation of 'Untapped', a tool to facilitate energy management in schools. Untapped was created by engineering consultancy Hoare Lea, together with technology company City Science, behavioural engagement consultants SE2, educationalist Flourishing and the energy analytics team at University College London (UCL)'s Energy Institute.

This tool was developed as part of the UK Government's Non-Domestic Smart Energy Management Innovation Competition (NDSEMIC). NDSEMIC (from here on referred to as 'the Competition') is an £8.8 million programme, funded by the Department for Business, Energy and Industrial Strategy (BEIS). It aims to maximise the potential for energy saving in three priority sectors (hospitality, retail and schools). To do this, it has developed energy management products and services that use smart meter data to help smaller organisations to manage their energy consumption better.

Nine projects were selected as part of the Competition to receive initial development funding. Seven of these passed through to the next 'feasibility and initial testing' stage. All seven project developers, including the developers of Untapped, also went through to the final stage of the Competition (from February 2019 to January 2020) during which the innovations were piloted with small businesses and schools in a real-world setting.

This report is part of a package of reports published as products of the Competition, which also includes six other pilot evaluations, an overall final evaluation report, insights for innovators, user impact case studies and an evaluation technical report. These are available on [www.gov.uk](http://www.gov.uk).

## Overview of Untapped

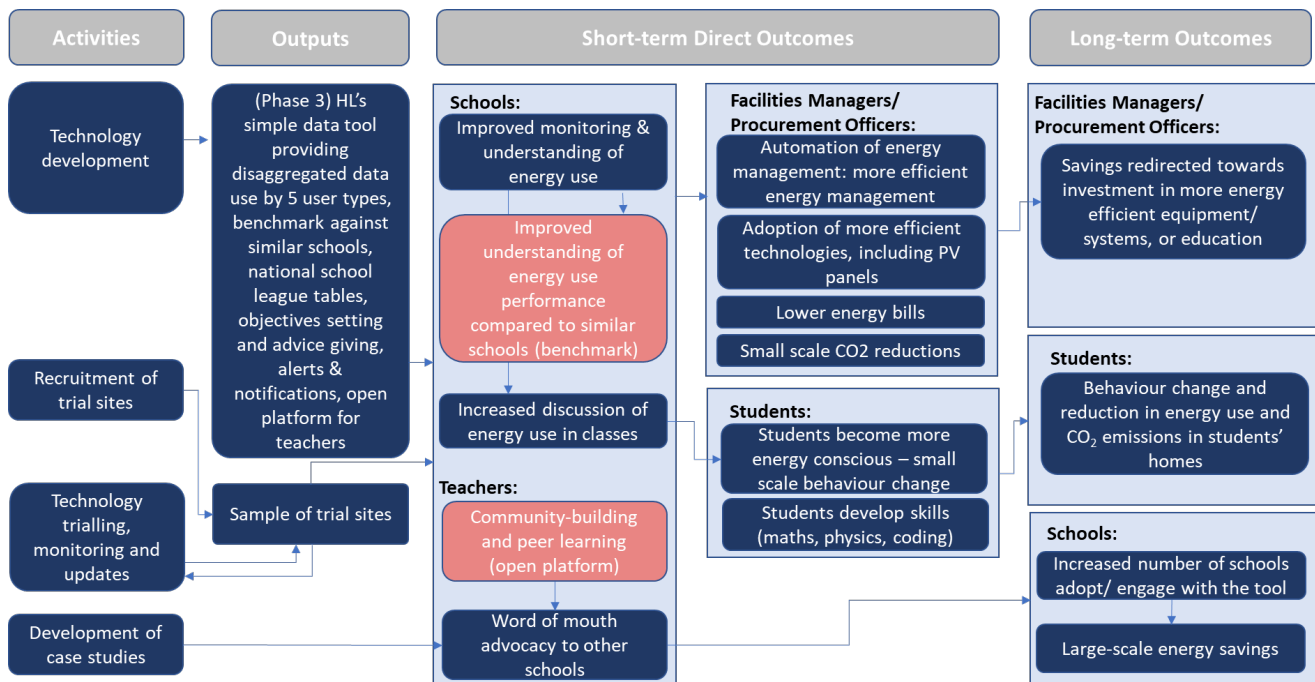
Untapped is an online energy advice platform for schools. It uses smart meter data to present users with information about their energy use and how this can be reduced. The tool is designed to be used by a variety of users including energy managers, headteachers, financial administrators, teachers and pupils. Untapped was intended to help automate energy monitoring and planning for *energy managers* (helping them to make more energy efficient operational decisions) and make *teachers and pupils* more 'energy conscious' (leading to them to be more efficient in how they used energy throughout the school).

## The anticipated effects of Untapped (its theory of change)

The key assumption behind the Untapped innovation project was that a lack of information about live energy use and how to reduce it is the main barrier to energy efficiency in schools. Hence, it was assumed that providing schools with live measurements of energy use, benchmarked against their peers in other schools and with information on potential energy saving opportunities, would be an effective strategy for encouraging increased energy efficiency.

Figure 1 presents the pathways through which Untapped was expected to create changes (its theory of change).<sup>3</sup> It describes the activities that Hoare Lea and partners conducted to develop the tool, the direct outputs of these activities, and anticipated short-term and long-term results ('outcomes'). As some of the tool's originally intended features were not developed,<sup>4</sup> certain outcomes could not be achieved and are not within the scope of this evaluation, as highlighted in red in Figure 1.

**Figure 1: Logic model showing Untapped's theory of change<sup>5</sup>**



<sup>3</sup> A theory of change describes how change is assumed to come about through a project or policy via the connections between project actions and outcomes – these are often called 'causal pathways' or results chains.

<sup>4</sup> Further details on this are available in the remaining of this section, in section 2 ('Tool design and development'), as well as in Annex 3.

<sup>5</sup> By 'automation of energy management', Hoare Lea meant to decrease the need for repetitive and systematic human intervention in energy management. Instead, they meant for schools to increase the number of processes and practices they have in place to systematically (and more easily) review their energy efficiency.

## Key features of Untapped

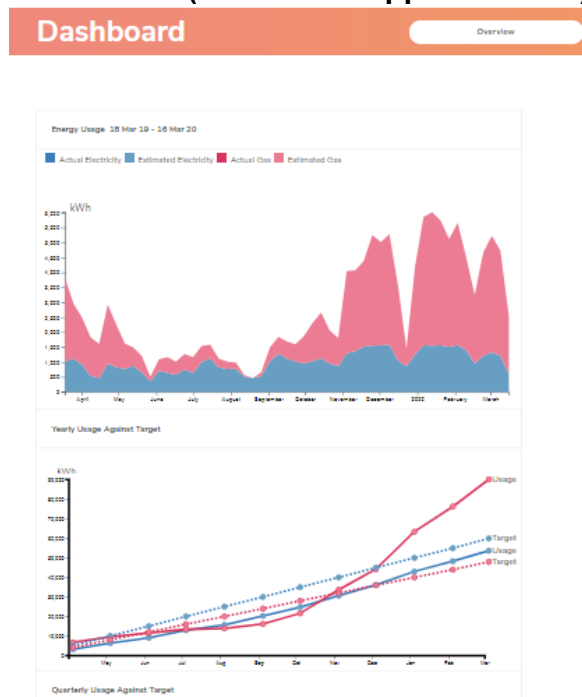
The core feature of Untapped was a **dashboard** hosted on the Untapped website, available to all registered schools (see Figure 2 and Annex 1). It showed energy use for gas and electricity, alongside a target set by the school. The user could view their energy use at half hourly intervals, but only up to the day prior. The user could also look at energy use across different timeframes and switch between an energy use and carbon emissions view.<sup>6</sup>

Four add-on features – accessible to all users – had the aim of enhancing user engagement:

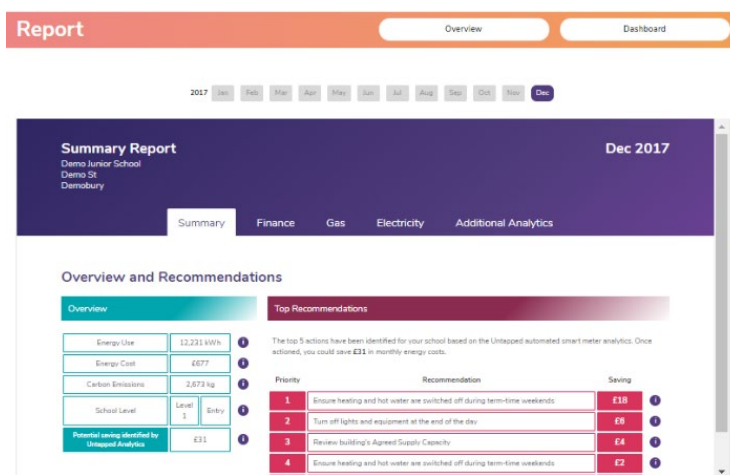
- **School-specific energy reports** on average monthly energy used, energy costs, and carbon emissions, plus 'top recommendations' on how to change usage and make energy savings (see Figure 3 and Annex 1).
- A **league table** of schools using the tool, comparing performance in energy use per square metre, carbon emissions per pupil, number of site interactions per pupil and targets for energy use reductions.
- **Lesson plans**, available on the Untapped website, for pupils aged 7 to 16 (key stages 2, 3, and 4) across a range of subjects (Maths, Computing, Science, and Personal, Social and Health Education<sup>7</sup>) aligned with the National Curriculum. Some of the lesson plans required the use of the school's own energy data and aimed to increase motivation and a sense of real-life application for students.
- **Educational resources** supporting extra-curricular activities, such as eco-clubs.

Two additional features were omitted from the final tool due to delivery challenges and availability of intended datasets. These features were: an **online community forum** for teachers to exchange tips and experiences; and a '**benchmarking and modelling**' feature by which schools would be able to compare their actual usage against a modelled 'energy efficient' school. Annex 3 gives more information on these features.

**Figure 2: Screenshot of an example dashboard (source: Untapped website)**



**Figure 3: Screenshot of a school Energy Report (source: Untapped website)**



<sup>6</sup> The dashboard of a 'test school' is [accessible here](#).

<sup>7</sup> Personal, Social and Health Education



In addition to the tool, Hoare Lea offered **higher levels of supplementary support** to some users of the Untapped tool where needed. This involved **a visit by an Untapped building performance engineer**, followed by bespoke recommendation reports with detailed suggestions on opportunities to save energy.

By January 2020, there were **at least 49 registered users of Untapped**. However, **very few of these were making use of the tool or engaging with the Hoare Lea consortium** (for discussion, see below). This evaluation has been able to obtain the views of four school sites registered to use Untapped, two of which had engaged with the tool or Untapped's services. The other two schools had only used the tool once. Further detail on the profile of these four schools is presented in Annex 1.

## This evaluation

The research for this evaluation was conducted by Ipsos MORI in conjunction with their consortium partner the Carbon Trust. Ipsos MORI designed the evaluation approach and designed and delivered all aspects of the methodology, except for the energy consumption analysis which was designed and conducted by the Carbon Trust, and quality assured by Technopolis.

The evaluation takes a theory- and case-based approach which is described in Annex 1. The findings draw on insights from two site visits to one school, telephone interviews with four users at three schools which had little engagement with Untapped and an online survey, which three Untapped users completed. It was not possible to check whether these respondents were the same as the interviewees.

The evaluation also utilises insights and data provided by the Hoare Lea consortium throughout the Competition and three interviews with the Untapped team. An analysis of energy consumption across most pilot sites during the pilot<sup>8</sup> (as compared to pre-pilot data for the same time of year) was also conducted. However, given that the evaluation findings suggest that very few registered users had actually used Untapped (for discussion see below), it seems unlikely that many of these sites can be considered 'true' users of the tool.

The evaluation team faced challenges in recruiting registered users to participate in interviews and the survey. These challenges seem to have been symptomatic of the wider challenges faced by the consortium team in engaging with registered users. The small size of the sample has limited the strength of evidence upon which conclusions about the effectiveness of Untapped can be drawn (for more information see Annex 1). However, in taking a case-based approach, the evaluation has been able to assess whether and how Untapped was used and – for sites that had used it – the extent to which it has contributed to changes in awareness, understanding, energy use and consumption at these sites.

## This report

The following chapter gives further information on the development of Untapped. Subsequent chapters summarise how schools engaged with Untapped (Chapter three), the outcomes of

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<sup>8</sup> This was conducted for a total of 59 meters. It was not possible to distinguish the exact number of schools, as data was anonymised, and some schools have more than one meter installed.

this (Chapter four), factors facilitating and hindering success (Chapter five) and conclusions (Chapter six).

## 2 How Untapped was developed and piloted

*This section of the report provides brief background information on certain aspects of the development and piloting process for Untapped. Challenges to meet their recruitment targets had implications for take-up and impact of Untapped and are discussed further in subsequent chapters of this report.*

### Tool design and development

Untapped worked by taking the data produced by schools' energy meters, analysing it, and proposing potential energy saving recommendations tailored to the school. Untapped intended to build on an existing piece of software which allows organisations to view and analyse their energy use by integrating three datasets about energy use, which schools could use for benchmarking purposes. However, access to two of these datasets proved to be no longer possible and the quality of data in the third created challenges for integration. Further detail on these datasets and associated challenges is provided in Annex 3. This meant that (1) the tool did not offer the full functionality expected to its users, and (2) there were delays which impacted on other aspects of the pilot.

### Pilot site identification and engagement

Hoare Lea's plan for identifying and engaging pilot users was broken down in several phases to reflect the structure of the Competition. They initially planned to recruit a small sample of schools by early 2019 with whom to test the tool before ramping up the number of recruits in Phases 2 and 3 of the Competition.

However, securing a positive initial conversation with schools was challenging due to the complexities in understanding who the decision maker was in the school and what metering they had available. The Hoare Lea consortium could have taken more advantage of its members' expertise in school engagement. As several consortium members were educationalists, these could have had a more significant role in the recruitment and engagement exercise. Ultimately, challenges in connecting with the right people in schools and delays between initial connection and follow-up meant that participation was not secured.

As a result, Hoare Lea refocused on engaging schools via school events; and recruited several multi-academy trusts (MATs) who promoted/rolled out Untapped to their schools. MAT schools constituted the majority of Hoare Lea's final pilot sample (36 of the 49 schools onboarded onto the platform and listed on Untapped's website), though Hoare Lea's interaction with these schools tended to be via a central contact, for instance a MAT energy manager. This meant that building direct relationships with schools themselves proved challenging. For example, Hoare Lea often had to rely upon the central contact passing on information (due to data

protection restrictions) and it was not always clear whether the messages had been passed on or not.

Ultimately, 49 schools were onboarded to Untapped during the period of the Competition. This included the 36 MAT schools, ten schools recruited through personal links of Hoare Lea consortium members and one that contacted the consortium directly to express interest in the tool, after being re-directed to Untapped by a school environmental charity.

## Pilot site recruitment and set-up ('onboarding')

The Hoare Lea consortium had a six-stage process for setting users up with the tool. This involved contact with different stakeholders, including communicating with the energy supplier, broker or data collector to ensure that the school's energy data could be fed into Untapped. The process also involved establishing what type of metering the school had available. In many cases this was not the smart metering set-up that was anticipated in Untapped's design and therefore further conversations were required to explore alternatives or provide schools with support to upgrade their meters. Further information on the recruitment process and its associated challenges is available in Chapter five (Factors which hindered and supported success).

## 3 How users engaged with Untapped

*This section of the report presents users' experiences of Untapped, including their motivation for using the tool, their level of engagement with it, features which they found useful and suggestions for improvements. Findings reported in this section have been drawn primarily from the qualitative interviews with pilot participants at the four schools interviewed.*

### Reasons for users' initial engagement with Untapped

Users interviewed for the evaluation all reported that they had a strong interest in improving energy efficiency in schools, and two had some pre-existing knowledge of energy use monitoring systems. Users interviewed for the evaluation had signed up to Untapped for at least one of the following reasons:

- They wanted to test their own systems, to see if Untapped could offer them anything new.
- They wanted to use the platform to raise awareness of energy efficiency with less tech-savvy staff in their own schools or other schools.
- They wanted to use Untapped to improve energy efficiency at their school (one user's school had been identified as one of the top energy users within the MAT).

### Expected and actual user engagement

Hoare Lea intended to engage a range of different users with Untapped (energy managers, headteachers, financial administrators, teachers and pupils). However, evaluation interviews conducted with schools suggest that **the profile of users was heavily skewed towards energy managers** working either onsite at the school or in the MAT overseeing a portfolio of schools. There was **very little evidence that any schools had launched Untapped with classroom teachers or students**, which means that the features of the tool that were targeted at them (i.e. lesson plans and league tables) were not utilised as anticipated (to any extent).

**A lack of awareness that educational resources existed was identified as the key barrier to the uptake of the tool by teachers and pupils.** The majority of the schools interviewed for this evaluation were not aware that they could engage pupils through Untapped, and none of the schools knew when they joined Untapped that educational resources were accessible on the platform (the one school who ended up learning about the resources did so as a result of Ipsos MORI's email when recruiting for interviews). The following two factors created difficulties for the Hoare Lea consortium in engaging teachers and other pupil-facing staff:

- **School structures** vary significantly from one school to the next, and they often lack transparency for external stakeholders. Responsibilities for energy management decisions are often split between several staff at the school or MAT and in some schools, there is little interaction between teaching and non-teaching staff. This was reported as a key challenge to recruitment and engagement by Hoare Lea, as they

decided to engage with one key contact for outreach and onboarding purposes, with teachers often not identified as a relevant stakeholder for this.

- Hoare Lea **did not utilise the consortium members with the most knowledge of the school sector for recruitment**; instead these consortium members were focused on the co-development of the educational resources with schoolteachers. Most schools on the platform were recruited by consortium members with the technical knowledge of the tool. As such, those people leading on recruitment were more likely to target non-teaching staff and promote the tool in terms of potential reduction in consumption / savings on bills, rather than as an educational resource.

## Level and scale of user engagement with Untapped

Overall, during its pilot, Untapped did not achieve the levels of engagement anticipated. According to the website's analytics,<sup>9</sup> **13 out of 49 pilot sites never logged on to the platform** after being given access and the **majority of schools piloting the tool had only logged onto the platform once**. Amongst the four schools interviewed for this evaluation, two had checked the platform once, one had logged on approximately once a month (three times in four months), and the other had not accessed the platform (though they were accessing information on their school's energy use compiled manually by Hoare Lea via the Untapped team's energy reporting feature).

The four schools interviewed for this evaluation gave diverse but inter-connected reasons for not using Untapped as expected. These are discussed below.

### Data access issues leading to a lengthy onboarding process

The delivery of Untapped was initially designed with the expectation that schools would have Smart Metering Equipment Technical Specifications 2 (SMETS 2) meters. However, it became evident that recruited pilot sites did not have these types of meters. Metering availability was not a challenge unique to this project, and Competition Partners implemented a variety of mitigation strategies to address this. Hoare Lea and its consortium partners also explored alternative routes to collecting the data, including the possibility of upgrading schools' meters to tight timeframes or seeking 'site by site' access to energy consumption data.<sup>10</sup> These routes typically required extensive, one-to-one conversations with each school's energy supplier, broker, or data collector or lengthy consent processes. This **considerably extended and complicated the onboarding process, leading some schools to disengage and, in one instance, to turn to competitors** to procure services like Untapped.<sup>11</sup>

*"I first got in touch with Hoare Lea and Untapped in February [2019]. I had correspondence with various people about getting permission from the gas and electricity companies and the various data handlers, but we would get so far and then it would just stop. The emails from Untapped would just stop and so that was very frustrating. So, in the meantime, I started pursuing other forms of support in terms of measuring our energy use using [another] dashboard as a catch all for that. [...] By the*

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<sup>9</sup> Project developer reporting

<sup>10</sup> See the insights for innovators note ('Developing smart energy management services for SMEs - NDSEMIC insights for innovators') published alongside this evaluation.

<sup>11</sup> This was due to both an extended onboarding process, and a lack of frequent communications and updates from Hoare Lea and consortium partners on the status of onboarding.

*time we do, it will be almost a year since I started saying 'I want a dashboard'." – Teaching staff*

One energy manager across a portfolio of schools reported that the **time constraints and lengthy Untapped onboarding process prevented them from setting up all schools within the MAT onto Untapped**. It also led them and a user in another school to question the reliability and accuracy of the dashboard data.

*"[Untapped] data has come from our smart meters, but what I don't know is how they then handled that. Did they add it all up to get a total? Have they done it per block? Did all the meters feed into it? I didn't have a chance to really check that out, I thought, well, you know, there's so many other things going on." – Non-teaching staff*

*"It seems a bit more estimated. I was not sure how much information there is. [...] I do feel that maybe it's not reliable, that's why it's not that place that I'd visit that often. It's out of date. So, it puts you off from revisiting." – Teaching staff*

## Time constraints

Time constraints were mentioned by all schools and users as a key barrier to: (1) getting to know the tool on their own without additional support from Hoare Lea (see point below about induction training); (2) using the tool; and (3) launching the tool with other, usually less tech-savvy, audiences (either teachers/ pupils, or other schools mentored/ supervised as part of a MAT portfolio). The barrier of time was exacerbated when energy management was not a user's core responsibility. Untapped, and the way it was marketed or offered to users did not adequately address these constraints, e.g. by providing training (see also below) or support mechanisms. It also appeared that the tool was not sufficiently tailored to the specific needs and/or opportunities in schools – e.g. the need to have live data in an accessible and shareable format and in a way that involves teachers and pupils / is linked to the curriculum.

## The key role played by people-led in encouraging engagement

**Both schools which reported that they made (some) use of Untapped (and benefitted from using it) were receiving the most extensive support offered by Hoare Lea.** This involved a visit by an Untapped building performance engineer, who would talk to site managers and facilities management staff about the capabilities of the Untapped platform and the conclusions the analytic tests had drawn from their school's energy data. Following these visits, recommendation reports were given to the schools with detailed suggestions on opportunities to save energy.<sup>12</sup>

By contrast, **other users reported that they had less support from Hoare Lea than they wanted.** For example, one user stated in interview that induction training at the time of the first log-in would have been useful to understand the benefits of Untapped, its key features and resources, and where to find them.<sup>13</sup>

*"They sent me an email and said, 'Log in.' I logged myself in. Nobody came and showed me the whole tool and said, 'This is how you use this, and this is how you use that.' That would have been good." – Teaching staff*

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<sup>12</sup> Project developer reporting

<sup>13</sup> Hoare Lea has also picked up on this issue during the pilot and is working to address it as highlighted in their Completion report.



## Competition with other energy management systems and tools

Three of the four schools that were interviewed were engaged in other energy saving initiatives or programmes, proposed by other organisations offering services exclusively to schools. In all three cases, this discouraged the main user from engaging with the Untapped package, or at least reduced the extent to which they engaged with Untapped or made use of all of its functionalities.

Two users interviewed already had systems in place to understand and monitor their energy use through other energy management tools or through their own analytics. They had also improved their energy processes and efficiency, and made significant energy savings, to the extent that one of the schools had won energy-efficiency awards for it. For this reason, there was less potential for Untapped to have an impact on them.

*“I’ve not really been using Untapped. [...] I’ve been doing what Untapped is aiming to do, we’ve been doing that for a number of years anyway.” – Non-teaching staff*

*“It runs parallel to our whole sustainability theme, so it’s not because of Untapped that we’re doing things differently.” – Teaching staff*

One of these users did note that they felt they would have benefitted more from Untapped had it allowed them to see ‘live’ data, or offered more granularity (e.g. by room, by equipment).

*“My default is the [other energy management system] because it gives me a greater granularity of information [...] I like to have that detail of data. I like to get a daily report that’s giving me information about this time last year when compared with today. I like to have that so I can pick up trends very quickly. [...] I have used Untapped and that’s to verify some of the things I’m seeing [on my other energy management tool].” – Non-teaching staff*

When prompted during an interview, one teacher responded that they were aware of and had browsed the eco-club resources and thought they could be particularly useful to schools that decide to set up their first eco-club. However, the teacher decided not to use this themselves because they already had an eco-club that was following a programme set by another organisation.

*“[T]here were really useful ideas and it was about how to start an eco-club and all that. But we have started an eco-club with the Keep Britain Tidy campaign, the Eco Schools. So, for that, to achieve their bronze award you have to follow their goals, so we’re trying to aim for those first. That’s why we haven’t really used them. [...] I think sometimes it becomes too much, because if we had just the one thing, if we just had the Untapped one and we were just following that, then that would be good.” – Teaching staff*

These findings suggest that **one of the factors reducing Untapped’s success in schools was the fact that some of the schools it targeted had a pre-existing green agenda, which Untapped was not able embed into**. This is an interesting finding, which contrasts with evaluation findings from other Competition tools, which had particular success when targeting schools with an environmental sustainability agenda. Factors that, based on evaluation evidence, may have played a role include the fact that Untapped was not considered to offer anything additional to services already being used as well as challenges in engaging schools sufficiently to ‘embed’ Untapped within an existing school sustainability culture.

Qualitative evidence triangulated with website analytics conducted on the Untapped website confirmed that engagement with Untapped increased after schools had received

communications from Hoare Lea and Ipsos MORI prompting them on their engagement with the tool (such as Hoare Lea's re-launch campaign in September 2019 and Ipsos MORI's recruitment for surveys and interviews).<sup>14</sup> This suggests that **schools re-engaged with Untapped when they were reminded by someone that they were piloting this tool, demonstrating that they need frequent reminders and notifications in order to sustain engagement.**

Overall, the use of frequent (and as much as possible, tailored) communications, support, push notifications or reminders to engage with Untapped/ Hoare Lea, is effective to (re)engage users, and sustain this engagement over time.

Increased (and, as much as possible, bespoke) support from Hoare Lea at specific points in time has been identified as key to engage users (or sustain their engagement over time), and to ensure that they were aware of the tool's features and using the tool to the best of its potential. Key milestones were identified in the school's journey with Untapped that would benefit from more intensive support from Untapped/ Hoare Lea:

- The experience of the first log-in is critical for catalysing ongoing engagement. An induction training at the time of the first log-in would be useful to understand the benefits of Untapped, its key features and resources, and where to find them.
- Ad-hoc support to energy managers to implement the energy saving recommendations.
- Ad-hoc support to energy managers or key decision makers if or when the school decided to invest in more efficient technologies. In this case, support would help users to (1) gather information via Untapped to build the case for such an investment and seek sign off from management; and (2) find a supplier proposing the best value-for-money.
- Ad-hoc support to teachers to point them to existing relevant resources to embed in the curriculum-driven lessons, or extra-curricular activities such as eco-clubs.

## User perspectives on Untapped's functionality and appeal

As discussed above, there was low take-up of and engagement with the tool. However, when prompted (in interviews) about the functions of Untapped they had found insightful or appealing, users identified:

- The **dashboard**, accessible on the front page, presented useful and relevant information (overall consumption, then broken down by month/ year across several months), **expressed in very simple and visual terms**, for example with clear graphs.
- The **'usage by day type' analytics** of the **energy report**, which presents colour-coded information around the school's energy usage broken down by the specific months and type of days (weekdays/ weekend),<sup>15</sup> **quickly enabled them to identify when their energy consumption was high.**

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<sup>14</sup> Evidence from our consultations with schools and from the web analytics completed by Hoare Lea in the completion report.

<sup>15</sup> Shades of reds were used to represent the level of energy consumption; the darker the red, the higher the consumption.



- The **recommendations** provided by the platform, along with **simple ‘pass’/‘fail’ system** on several typical things to look out for in school was **useful for highlighting relative performance against expectations**.
- **Setting goals** for energy usage was also an appealing aspect of the tool for the most engaged users, though none of the users interviewed by the evaluation had used this yet.

*“I think being able to login and see the general graph, seeing where we are, what’s estimated, and then the goals would be quite good once we get going, because at the moment we’re trying to get that information to be able to show it. If it becomes visual, I think it would be quite a nice thing to visualise and see that we were above that level and now we’re gradually coming down.” – Teaching staff*

Users interviewed also fed back on functionalities that could be improved:

- Three of the four schools that were interviewed stated **insufficient granularity of the data** as the **reason why they were not engaging with Untapped** (two schools) or why they had decided to trial another tool and would likely stick to using this other tool in the future (one school). Other tools they were satisfied with had either: (1) ‘live’ data; (2) allowed for a breakdown of energy consumption down to the appliance; or (3) had alerts and push notifications for abnormal levels of energy consumption.

*“The [other dashboard we commissioned] will be very sophisticated. [...] I think for me it’s about granulation. If you have got granulation minute by minute, then you can really see what’s going on.” – Teaching staff*

- While **educational resources and progress tracker/ league tables** had been one of the most appealing features for the one teacher interviewed for the evaluation, they had not used them, and Untapped had not been rolled-out to the pupils in their school. More details on the challenges encountered can be found below in the section outcomes for teachers and wider school staff.
- Although the recommendations were reported to be useful, users would have liked **more advice/support as to how to implement some of the actions recommended**, as energy managers were sometimes lacking the skills and knowledge. Tips were also **less insightful if**, like it was the case for one of the schools, **the data** they can access on the dashboard **is non-live**.

Users who had an existing understanding of energy management were able to navigate the tool themselves. Users who did not have this existing understanding required support to use the tool, either from Untapped, or in one case through planning to hire a dedicated energy manager in their MAT. This suggests that **the tool was not easy to use for users without an existing understanding of energy management**.

## 4 The results of the pilot of Untapped

*This chapter discusses the extent to which the primary expected results (outcomes) of Untapped were achieved (as anticipated in its theory of change (see Chapter one)).*

Overall, Untapped did not achieve the engagement expected amongst users piloting the tool. Very few participants had accessed or used the tool and amongst those which had, only one consulted have found Untapped beneficial. Pilot participants consulted had not benefitted from Untapped, either because they had existing energy management systems in place, which they preferred, or because they found that Untapped did not meet their needs.

### The effects of Untapped on energy consumption

Based on an assessment of the available evidence, there is a **low level of confidence that Untapped contributed to energy savings at any site** (see Table 1, overleaf, for the rating framework). This is based upon the following sources of evidence:

- **Self-reported behaviour change:** Out of four schools and up to nine pilot participants consulted (either through interview or survey), one user reported that they had made changes to their knowledge and energy use behaviour over the period of the pilot which they attributed to Untapped. All other users reported that they did not find the tool useful or that their energy use behaviour was being driven by other things (e.g. use of other systems).<sup>16</sup>
- **The perspectives of multiple users at a single site:** In at least two sites, more than one user was consulted, but they converged in their opinion that the tool had not led to any energy use behaviour change.
- For all sites consulted, it was also possible to **test the assumptions underpinning the overall Untapped theory of change**. The results of this analysis were presented in Chapter five and they suggest that several of the assumptions underpinning Untapped had not held true in practice.
- Across most sites visited, the **potential for other factors to be driving any changes** (e.g. change in building/business operating hours or reduced building use) observed was investigated and was found to have had greater impact than use of Untapped.
- An **energy consumption trend analysis** was conducted on schools which had been onboarded to the Untapped platform to detect any potential changes in energy consumption. The trend analysis showed no average impact upon energy consumption. However, strong conclusions could not be drawn from this analysis as an intervention start date (when users started using the tool) was not available for most sites.
- Qualitative evidence from two schools that had used Untapped shows that **they had reviewed and amended their energy management practices and processes to become more energy efficient** over the period of using Untapped. However, **only one of these schools attributed this change directly to its engagement with Untapped**.

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<sup>16</sup> Findings from the one survey response received were analysed qualitatively, and in combination with the qualitative interviews conducted with key users at the school.

This school's experience of Untapped is described in case study #1 below. The other school indicated that they had already planned to undertake these changes before engaging with Untapped, and that the tool did not necessarily provide them with additional information in order to make those changes.

- A deep dive into the energy consumption data of the school above which attributed changes in energy management to Untapped and self-reported energy savings (see case study #1 below). While average term weekday hourly loads and daily peaks saw a reduction, this did not outweigh increases in average overnight hourly load or in average school holiday consumption.. Therefore, despite interventions being implemented, the analysis did not find quantitative evidence of savings.

For each Competition tool, the evaluation assessed the extent to which the tool had contributed to energy savings at pilot sites, and the strength of the evidence supporting this. Eight 'types' of evidence were defined and scored for strength (see Table 3 in Annex 2). A higher score was given to evidence which was observed (e.g. energy consumption data) and triangulated (displaying a convergence in qualitative evidence and energy consumption data) or identified at a larger number of sites. An overall score was derived to give an **average confidence rating in the evidence available; Untapped scored 0.38, i.e. there is a 'low level of confidence that the tool has contributed to energy savings at any site'**. The scores and associated confidence ratings are outlined in Table 1 below. Annex 2 provides more detail on how the score was derived.

**Table 1: Energy savings confidence ratings (Untapped rated 0.38 'low level')**

0- 1	Low level of confidence that the tool has contributed to energy savings at any site*
1 – 1.99	Medium level of confidence that the tool has contributed to energy savings in at least some sites
2 – 2.99	High level of confidence that the tool has contributed to energy savings in at least some sites
3 to 4.5	Very high level of confidence that the tool has contributed to energy savings in at least some sites

*\* A low level of confidence does not preclude the tool from working in the future, if some adjustments / lessons learned are taken on board.*

The box below provides further detail on the one school consulted which had used and benefitted from Untapped, in order to explore whether energy savings might have been achieved there.

#### **Case study #1: An example of a school using and benefitting from Untapped**

**User:** energy manager | **Onboarding method:** Through MAT | **Knowledge of energy:** already managing energy but looking to be more efficient | **Use of Untapped:** reports only – not the website

The energy manager at this school reported changes to the school's energy consumption behaviour and attributed these changes to Untapped.

The user had received visits from Untapped and used its tailored energy report. They used the recommendations to review how and when energy was used, comparing this against the school's needs, and understanding how to better utilise the building management system (BMS).<sup>17</sup> In the first instance, **recommendations that appeared less resource-consuming and relatively easy to implement were actioned on the day / in the following weeks.** The range of quick fixes implemented are described below.

The school reduced the overall time when high-consuming appliances were turned on. This was done by re-scheduling their BMS to delay when such appliances (e.g. ovens in the kitchen) or systems (e.g. ventilation) would be automatically turned on.

*"We changed our whole process [once energy consumption of one cooker was known]. Where, before, we'd turn the cooker on in the morning when we arrived [...] We now wouldn't turn it on until the first oven load was ready to go in [...] now we turn it off straight away [once cooking has finished], whereas before we'd leave it on until we went home." – Non-teaching staff*

The school also inputted the holiday calendar in their BMS so that all electrical appliances would be automatically turned off during half-terms and holidays. Sporadic days where energy was needed were handled manually by the energy manager, and on a case-by-case basis. This change is where they think they have saved the most energy.

The support and guidance from Hoare Lea on how to implement those tips – simply by showing them once how to change the settings on their BMS or equipment - had been key to making those changes happen.

Further, **there is evidence to suggest that the first few tips disseminated during this visit sparked a change of mindset for the main user.** Once the energy manager had been invited to review how and when certain appliances should be used, or certain systems should be set, this spontaneously prompted them to repeat this process with a range of other appliances.

*"Once we realised just how much the ovens were using, it then made me look at the whole business and go, 'Well, in that case, what don't we need on? What are we turning on out of habit, rather than because we need to use it?'" – Non-teaching staff*

The energy manager at this school indicated that those changes had helped the school to save energy (and in turn, to reduce their energy bills). However, this **self-reported reduction in energy consumption was not supported by the energy consumption analysis conducted for this evaluation.** Instead, their annual electricity consumption marginally went up by 2% when comparing their energy usage from the two previous years to the intervention period. This suggests that the changes made either had very little impact on their site consumption, or that their effect was masked by influencing factors other than weather that cannot be accounted for (e.g. unreported changes in energy equipment, changes in school buildings, etc.).

<sup>17</sup> A building management system is a computer system which controls a building's mechanical and electrical equipment such as heating, lighting, ventilation and security systems.

## The effects of Untapped on teachers and educational outcomes for pupils

Most of the schools interviewed by the evaluation had not launched Untapped with teachers or pupils. Further, key features of the tool aimed at these groups were either not finally implemented (the teacher 'online community' feature) or were not utilised as expected (the lesson plans).

**Only one of the schools interviewed by the evaluation had made use of Untapped for teaching purposes.** When the teacher was preparing for a science lesson (usually a week prior to that lesson) on energy-related issues, they would look at the Untapped website to see if they could use (1) lesson plans or (2) other contextual information provided on the platform which could illustrate science subjects. To some extent, this contributed to fostering classroom discussions around energy issues.

*"In science I've used a bit of the website, when we were looking at renewable sources of energy and talking about fossil fuels and things." – Teaching staff*

It appears that, in both cases, by not developing or promoting these features, the Hoare Lea consortium missed an opportunity, as amongst the users interviewed by the evaluation there was an interest in these.

- One teacher, who thought that the lessons plans and educational resources could have been a useful feature of Untapped, identified time as a key barrier (in getting up to speed with the dashboard and browsing/tweaking available resources). The teacher also flagged that further support and training from the Untapped team (to understand features available to use the platform to the best of their availability) might have made them more likely to use the resources.
- When prompted (in interview) about the educational resources, schools indicated that their teaching staff would likely be interested in engaging pupils on energy-related issues, particularly when those schools already had structures in place that could well-support this, such as eco-clubs or similar extra-curricular activities.
- Similar to the 'online community' feature, one user commented:

*"The not so useful thing is the fact that you cannot compare the schools. I think Untapped could become a platform for schools across the country, because they've got quite a few schools on this – that I can see the names of [on the website]– so if all those schools could share their good practice, I think it's a really good platform for that." – Teaching staff*

The fact that, due to data access issues, one school did not have to the most up-to-date energy data on their dashboard until a few months after joining Untapped had prevented that user from getting the most out of the lesson plans.

*"I think for maths there was a resource where the children are meant to have the data reading from the meters and then they've got to use that reading and compare the cost of energy from different companies and things like that. But [we don't actually have] the data [their Untapped data is not up to date], so although the exercise is really good you need to have that source first." – Teaching staff*

Interviews with Hoare Lea consortium members confirm that the schools they spoke to when developing and testing the educational resources showed enthusiasm for the resources and the tool. However, it appears that there was a lack of coordination and synergy between the work been done to market Untapped, the engagement activities of incentivising schools to use the tool, the technical aspects of getting energy data feeding into Untapped, and the work to engage teaching staff and inform them about the educational resources.

## Longer-term outcomes

This section considers Untapped's progress towards the longer-term impacts outlined in its theory of change. It was not expected that such outcomes would be realised in full by the end of the Competition.

In the long-term, it was expected that Untapped would enable cost savings derived from using Untapped to be redirected towards investment in more energy efficient equipment or systems, or towards education.

Whilst there is no evidence that Untapped enabled energy cost savings to be redirected, it is the long-term objective of the two schools that have engaged with Untapped.

*“At the moment, we're just trying to understand our energy usage before we make big changes. I think we're at the stage of trying to monitor it first.” – Teaching staff*

*“We want to make a baseline as much as anything else, so that the big projects that we put in place, we can see how much they are valued [financially].” – Teaching staff*

For the one school who has actioned some of the tips, the changes they made to their energy management processes are likely to endure. This school has also stated that Untapped is likely to be used by their MAT to oversee energy performance across a range of schools in their portfolio. However, that is dependent on the MAT hiring a member of staff with the relevant skills who would be dedicated to this activity. However, another school commented that their use of the tool is likely to be limited to using the educational resources it provides.

*“We have got other options but I think, probably, going forward the Untapped dashboard will become less relevant because the new [other dashboard we are trialling] will be more granulated and I think that, on the other hand, the [educational] materials [on Untapped] we hope will be good and will not only be used but also prompt development of those materials.” – Teaching staff*



## 5 Factors which supported and hindered success

This section discusses the factors which supported and hindered the Untapped pilot's success and is based on the findings presented above. The factors which limited the pilot's success relate to assumptions inherent in the design of Untapped; these assumptions are set out and discussed in turn. This chapter is based on the findings presented above, supplemented with further insights from qualitative interviews and the document review.

Overall, factors hindering the success of Untapped have included: lower than expected levels of recruitment; delays in onboarding schools and accessing their data, which created challenges for the engagement and retention of users; (linked to this) a lack of awareness amongst users in schools about the full functionality of the tool; and some issues with users' experiences of the tool.

Overall, the **assumptions implicit in Untapped's design** that were needed for Untapped to fully achieve its intended results **did not materialise over the course of the pilot**. That these assumptions did not occur as anticipated by the Hoare Lea consortium severely limited the extent to which Untapped achieved its intended results. The remainder of this chapter discusses this in more detail.

Design assumption 1: Hoare Lea and consortium partners are able to find a route to access energy data on a site-by-site basis at a reasonable cost.

Design assumption 2: Hoare Lea and consortium partners are able to access benchmarking data from other sources, to integrate as an additional feature of the tool.

The Hoare Lea consortium **faced notable challenges in accessing energy data**. Many schools did not have the SMETS2 meters that Hoare Lea had envisaged and therefore Hoare Lea were not able to explore the relevant SMETS data access routes. For those sites with advanced meters [an earlier generation of smart meter], Hoare Lea experienced delays and difficulties in accessing this data through other means (for example in obtaining and evidencing the relevant consent needed to obtain data from utility or data aggregation companies). The subsequent delays in the onboarding process led schools to disengage.<sup>18</sup>

The consortium also faced **challenges in accessing and making use of data from other organisations**. This prevented the intended 'benchmarking and modelling' feature of the tool from being developed and attempting to access this data took longer than anticipated. This led to delays in other aspects of the pilot.

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<sup>18</sup> Note that this was due to both an extended onboarding process, and a lack of frequent communications and updates from Hoare Lea and consortium partners on the status of onboarding.

Design assumption 3: Hoare Lea and consortium partners are able to find an effective and efficient route for customer acquisition, through an enhanced understanding of customer motivators, drivers and attitudes

Design assumption 4: The Untapped platform works well and is fit for the complexity of metering found in the school environment

Hoare Lea struggled to identify an efficient route to customer recruitment. Whilst their initial direct engagement and word-of-mouth strategy might have arguably enabled them to understand their customers (as it involved fairly in-depth interaction with schools), Hoare Lea found that **these methods were too slow and resource intensive**. Further, those **responsible for recruitment were technical experts rather than school specialists, and therefore had less knowledge of how to engage with schools** and which staff to speak to beyond energy managers.

Given these challenges, the Hoare Lea consortium proactively attempted to adapt their approach by refocusing on market intermediaries including those that may enable access to data and sites. However, challenges remained in adapting their tool design to the complexity of the school metering environment as they onboarded schools. Further, there were outstanding challenges around data access and resourcing which meant that anticipated features of the platform were not finally realised. These **design challenges, coupled with the challenges of recruitment, impacted on the timeline for delivery of the pilot** (and therefore its success). Hoare Lea and consortium partners spent many months revising their recruitment strategy and onboarding sites, with most sites beginning to use Untapped only from June 2019.

Design assumption 5: Hoare Lea and consortium partners are able to develop case studies that strike the right balance between a success story and representing a case with which other schools can identify.

Design assumption 6: Word-of-mouth recruitment is effective in the context of schools.

Hoare Lea was not able to develop case studies as intended and the spontaneous word-of-mouth recruitment of schools which they had anticipated does not appear to have occurred. However, there is anecdotal evidence that school environmental charities can act as a key point of contact for schools interested in energy efficiency, and re-direct them to tools like Untapped (one occurrence). Spontaneous word-of-mouth recruitment, arising from schools' positive experience using the tool, may occur in future if issues around uptake and engagement with the tool are addressed.

Design assumption 7: The tool's user interface strikes the right balance between complexity- delivering relevant and actionable energy information – and simplicity – favouring user uptake.

Hoare Lea assumed that the tool would provide meaningful information for *all* its intended key users - i.e. that energy managers would be able to find the granularity of data they required, while ensuring that the tool was simple enough to use for pupils and other audiences with less data literacy. However, it seems that – from the results of the web analytics and this evaluation's in-depth consultations with four schools, **the tool was not able to strike the right balance between complexity and simplicity**. The energy managers interviewed for the



evaluation found that the data was not granular enough for their own use, though they considered that the information presented was very easy to understand and interpret, which would make it relevant for teachers and pupils to use. However, teachers and pupils (as discussed above) had a very low awareness and practically no uptake of the tool.

Design assumption 8: The tool provides features that effectively encourage behaviour change and the implementation of energy efficient measures e.g. up-to-date list of applicable measures, indications of organisations or funds that support implementation of such measures.

Design assumption 9: Schools follow advice given and set own objectives to reduce energy use; schools have resources or access to low-carbon finance to implement energy efficiency measures.

The tips and recommendations on the Untapped platform were expected to prompt behaviour change amongst users, and the implementation of energy efficient measures in the long run. **There is some evidence to suggest that the tips were indeed considered relevant to the schools, and effective in driving small-scale changes.** However, users indicated that Untapped could do more to provide support to provide information and guidance when 'building the case' for and investing in more efficient energy equipment, for example by suggesting suppliers with the best value-for-money.

## 6 Conclusions

This evaluation report has taken a theory- and case-based approach to drawing out how Untapped was designed and delivered and the factors which hindered and supported its effectiveness. It has sought to explain, as much as possible, why things did or did not occur as anticipated and to use these explanations to develop potential lessons upon which improvements could be made.

Overall, the evaluation has found very limited evidence of Untapped contributing to its anticipated results, including energy consumption reduction. Indeed, overall, the evidence suggests that Untapped – in its current form (recruitment method, method of promotion and tool format) – does not contribute to users in schools reducing their energy consumption. Subsequently, the evaluation has a low level of confidence that Untapped contributed to any energy savings at pilot sites. However, a low confidence level does not preclude the tool from working in the future, if some adjustments/ lessons learned are taken on board.

The tool was designed to target both energy managers in order to facilitate both better energy management, and teachers and pupils in order to raise awareness of energy efficiency and sustainability and deliver other educational outcomes. However apart from the energy report, features aimed at teachers and pupils (such as educational resources and a 'league table' of performance) were found to be ineffective, as few users were aware of them.

As discussed throughout this report, there were several factors which prevented the Untapped pilot from being delivered as planned. First, the tool was not as fully developed as originally planned due to challenges in accessing data needed to develop the tool (explored throughout and in Annex 3). Second, recruitment onto the pilot was severely affected by: problems in accessing energy consumption data and in developing an effective strategy for data access, a lengthy and complicated 'onboarding' process, and unanticipated difficulties in identifying the right person to engage with in schools. Third, once onboarded, schools were deterred from using the tool by a mixture of factors within and outside of the Hoare Lea consortium's control. Schools with existing energy management systems or tools preferred these alternative systems because they provided a greater granularity of data. This evaluation has highlighted several opportunities for increasing the functionality and attractiveness of Untapped for such users.

The evaluation spoke to one user of Untapped who had been satisfied with and reported positive outcomes (changes to behaviour and reduction in energy use) resulting from their interaction with the tool. However, no quantitative evidence of such savings was observed during a 'deep dive' analysis of this school's energy consumption. Further, this user had not been using the Untapped tool, but – rather – had benefitted from the Untapped energy report and face-to-face support from the Hoare Lea consortium.

The findings from this report suggest the Hoare Lea consortium could take forwards the following points as it progresses its commercial offer, which may also be relevant for other innovators:

- Schools are very particular environments where those using energy within them have specific needs and interests. Engaging with staff to understand each schools' contexts and objectives is important to ensure their engagement and customer journey with Untapped is tailored accordingly, and that they have adequate support to achieve their objectives.

- Similarly, Untapped appears to have worked best when accompanied by people-led support to upskill users about how to use/engage with Untapped and to overcome resourcing constraints on the schools' side which may otherwise limit engagement. Hoare Lea might therefore explore how it may be possible to incorporate effective induction and ongoing support within a commercial offering, e.g. through improved induction materials (such as videos) and partnerships with other organisations which may be able to provide ongoing support.
- A lack of awareness that Untapped's education resources existed was a key barrier to uptake in several schools consulted for this evaluation. The promotion of the educational aspects and resources of the platform could be more systematically embedded in the way that all Untapped staff present the tool to potential users, e.g. through more standardised message hooks, a user video and/or a standardised induction presentation.
- Hoare Lea may wish to consult teaching staff further about what teaching materials they would find most useful and adapt the educational resources on offer accordingly. Teachers may benefit most when offered a breadth of resources, ready to use in specific lessons or eco-club sessions and tailored to a range of age groups, as findings show they have little time to adapt existing materials that are not already tailored to their audience.
- For other innovators developing smart energy management solutions for schools, research about other tools in the marketplace (and which aspects have been successful at driving engagement and why) may help to add value to new offerings. Similarly, researching the metering landscape during early design stages and how energy consumption data can be accessed may help to mitigate delivery risks and challenges.<sup>19</sup> Indeed, the findings confirm the value of placing equal weight upon consumer engagement and incentivisation alongside more technological aspects of design.

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<sup>19</sup> See the insights for innovators note (*'Developing smart energy management services for SMEs - NDSEMIC insights for innovators'*) published alongside this evaluation.

# Annex 1 Evaluation methodology

The research for this evaluation was conducted by Ipsos MORI in conjunction with their consortium partner the Carbon Trust. Ipsos MORI designed the evaluation approach and designed and delivered all aspects of the methodology, except for the energy consumption analysis which was designed and conducted by the Carbon Trust, and quality assured by Technopolis. The evaluation was led by a dedicated evaluator who followed the implementation of the tool through its design phase (Phase 1), feasibility and initial testing (Phase 2) and roll-out and further testing (Phase 3).<sup>20</sup> The final evaluation report, and reports for the other six case studies, are available on [www.gov.uk](http://www.gov.uk).

## Evaluation approach

The evaluation aimed to evaluate the extent to which Untapped generated anticipated outcomes and impacts, as well as the circumstances in which these were achieved. A case-study, theory-based approach was taken to provide a framework for in-depth analysis of change within the 49 trial sites of Untapped. This design was chosen both for its appropriateness to the tool roll-out and design, and target sample of 49 schools, and because of its fit with the data collection options available to the team.

The theory-based approach uses the Untapped theory of change as its framework. The theory of change was developed in Autumn 2018, by Ipsos MORI in consultation with Hoare Lea through analysis of the Untapped's business proposal, points discussed at project inception meetings and through familiarisation interviews with the Untapped project lead and key consortium partners.

The extent to which anticipated change (i.e. 'outcomes' and 'impacts') took place as observed – and then evidence to demonstrate that Untapped had contributed to this change – was assessed and is described in this report.

## Sources of evidence and fieldwork activities

This report has been developed upon the basis of primarily qualitative evidence - the results of a survey and evidence gathered through site visits. That is because there was very limited quantitative evidence available in the means of survey and energy cost data, and the energy consumption provided mitigated findings with methodological limitations.

- **Online survey:** Three Untapped users, representing three out of 49 schools listed on the Untapped website, completed an online survey before using Untapped (between June and October 2019), and one of those users followed up and completed a survey after having used Untapped, in January and February 2020. This covered questions about use of the tool, energy management and use behaviour and energy-efficiency measures. The survey<sup>21</sup> included between 20-30 questions<sup>22</sup> and two open-text

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<sup>20</sup> The evaluation lead met regularly with the tool's design team, liaising with them on the evaluation plan, designed the evaluation's methodology, managed the team of data collectors and the development of this report.

<sup>21</sup> An example survey questionnaire used across NDSEMIC projects is included in the evaluation Technical Report, available on [www.gov.uk](http://www.gov.uk).

<sup>22</sup> The exact questionnaire length for each respondent varied depending on the project and type of participant/organisation.

questions on reasons for joining up to use the tool and on how pupils have influenced change in the school.

- One longitudinal **case study visit** was carried out by Ipsos MORI in a participating school, the pre-Untapped visit was conducted in November 2019, and the post-visit in January 2020. The visit involved in-depth interviews with two individuals per school to reflect the spectrum of user profiles (teachers, energy managers and head teachers) covering the individual's responsibilities with respect to energy management; approaches to monitoring energy use; how they had used Untapped and its impacts. It also included an observational element, to understand how users interacted with Untapped and their interpretation of which appliances and equipment used energy in their school.
- Three **user interviews** were carried out by Ipsos MORI with participating schools that had little engagement with Untapped in January and February 2020. The interviews were conducted with the main user of the tool at the school (usually an energy manager or a financial administrator), covering the individual's responsibilities with respect to energy management; approaches to monitoring energy use; how they had used Untapped (if at all) or barriers to use the tool; as well as the challenges they faced. Table 2 overleaf presents a summary of the profile of these three schools and the one school that was visited by the evaluation team, in terms of their engagement with Untapped.

**Table 2: Summary of interviewed users' take-up and use of the tool**

	School 1	School 2	School 3	School 4
Reasons for joining Untapped	To help other energy users in their school and MAT to engage with energy efficiency	To mentor other schools to engage with energy efficiency	Onboarded by their MAT, who identified the school as one of the top energy consumers in the MAT	To improve the school's energy efficiency and raise awareness amongst staff and pupils
Existing awareness of / interest in energy efficiency	Already managing energy, with systems and strategies in place to improve energy efficiency	Already managing energy, with systems and strategies in place to improve energy efficiency	Already managing energy, but looking for ways to become more energy efficient	Looking for ways to become more energy efficient
Use of Untapped	Had checked the tool once only. Later, disengaged from Untapped	Had checked the tool once only Later, disengaged from Untapped	Never logged in to the tool (but their MAT did) Had used energy reports Found Untapped to be beneficial	Had checked the tool several times (once per month) Decided to trial a second energy monitoring system from a competitor
Factors impeding take-up / use of Untapped	Length and complexity of Untapped onboarding Personal time constraints	Already are energy efficient and have systems in place Did not intend to use Untapped for their own benefit	Personal time constraints Required more support	Length and complexity of Untapped onboarding Personal time constraints Required more support
Nature of access to and support from Untapped	Access to Untapped platform No supplementary support from Hoare Lea	Access to Untapped platform  No supplementary support from Hoare Lea	Never logged in to the tool Used the energy reports Level 3 support from Hoare Lea	Had checked the tool about once per month) Had made use of the educational resources Level 3 support from Hoare Lea

- Three **process interviews** were carried out by Ipsos MORI with the Untapped team at Hoare Lea (and consortium partners) in January and February 2020. The interviews were conducted with key members of the Untapped team, discussing the different aspects of the tool, its design and delivery throughout the Competition, including access to data, recruitment and engagement of schools, user-research and development of the educational resources (i.e. lesson plans). The interviews covered the individual's responsibilities, experiences and lessons learnt with respect to the project delivery.
- **ECA:** An overall ECA trend analysis was conducted for a total of 59 meters. However, given the absence of a clear pilot start date hindered the ability to define the period of pre-pilot energy use and assert any changes in consumption. A further 'deep dive' analysis into one school was conducted and in this case the pilot start date was clearer, enabling an assessment of changes in energy consumption for this school.
- **Project documentation and correspondence:** As part of the Competition, Hoare Lea (and the other Competition Partners) were expected to regularly update BEIS and the Ipsos MORI evaluation team on their delivery progress and learnings via milestone deliverables and project documentation. This was reviewed by Ipsos MORI and has supported the analysis in this report. Additionally, the evaluation team had regular bi-weekly updates with the Competition Partner to establish progress with the project and collate necessary information (e.g. recruitment challenges, partnership relationships etc.). Further documentation was made available to the Ipsos MORI evaluation team through Hoare Lea's end-of-Competition report and in most cases provided useful supplementary information directly to the evaluation team.

## Limitations of the methodology

Overall, the limitations of the methodology were primarily as follows:

- **Low response rate for surveys:** Despite multiple reminders being sent by both Ipsos MORI and Hoare Lea, and the offer of a financial incentive for completion, only one school took part in the survey, restricting the evidence base for the evaluation to those who took part in qualitative research and the ECA.
- **Limited number of engaged tool users:** As described in Chapter two, many of the pilot sites had not actively engaged with Untapped. This limited the pool of participants to the evaluation and the evidence base on which to assess the impact of the tool.

## Annex 2 Assessment of Untapped's contribution to energy savings

Assessing the energy saving potential of smart energy management tools was central to the evaluation, however in the context of the Competition it was not possible to collect a single definitive estimate of impacts and there were a range of challenges in using and interpreting energy consumption data for pilot sites. In recognition of the circumstances involved (limited access to historical data, small sample sizes, no control groups), a mixed-methods approach to evaluating energy savings was taken.

This approach drew on a range of evidence (outlined in Annex 1) to create a summary indicator of the evaluation's confidence that the tools had contributed to energy savings for pilot sites (by comparing the findings of energy consumption analysis, self-reported savings, and evidence of behaviour change from qualitative interviews). An analytical framework that considered both the strength of evidence, and its robustness, was used to produce the indicator (see Table 3 overleaf). The methodology for this described in more detail in the Final Evaluation Technical Report published alongside this evaluation.

On the basis of these assumptions and the evidence available, an analytical 'strength of evidence' framework was developed which, when applied, generated a confidence rating in the evidence of energy savings for each pilot. This confidence rating was illustrated in Table 1 in Chapter three and is recopied at the end of Table 3.



**Table 3: Untapped contribution to energy savings – evidence strength assessment**

Evidence 'type'	Description of evidence type	Numerical rating of evidence type
<b>Energy Consumption evidence</b>		
Energy consumption reductions observable on average across all sites (before/after analysis).	The ECA showed no change in average daily consumption attributable to the tool when comparing energy data from pre-pilot to data collected during pilot. Although historical data was available for the full year before using Untapped, strong conclusions could not be drawn as an intervention start date (when users started using the tool) was not available for most sites.	0 <sup>23</sup>
Energy consumption reduction triangulated with evidence of energy use behaviour to suggest potential that tool use has reduced energy being used (e.g. evidence of reduced use after interacting with tool, but other possible explanations, e.g. other drivers of process change or equipment purchase, cannot be ruled out).	<p>Conducted for one site only for which sufficient data on the school profile and premise, use of Untapped and behavioural changes was available.</p> <p>For this site, pre-post pilot comparison (Jan 2018-Jun 2019 vs Jun 2019-Jan 2020) showed a slight increase in consumption of around 2% when comparing direct 2018 and 2019 data equivalents. While average term weekday hourly loads and daily peaks saw a reduction, this did not outweigh increases during school holiday periods and average overnight hourly load despite interventions being implemented. The data did not exhibit weather dependence and was strong enough to conclude that there is little evidence to show the interventions positively impacted consumption.</p>	0 <sup>24</sup>
<b>User-reported evidence</b>		

<sup>23</sup> This group of evidence could be rated as either “not evident” (0), evident but only with red quality rating (1), evident with an amber quality rating (3) or evident with a green quality rating (4.5).

<sup>24</sup> This group of evidence could be rated as either “not evident” (0), evident but only with red quality rating (2), evident with an amber quality rating (4) or evident with a green quality rating (6).

Self-reported energy savings of actual reductions in consumption (according to the app or their energy bills) that the user assigns to use of the tool.	No site reported any reductions in energy bills / other energy saving observed.	0 <sup>25</sup>
Multiple users at one site converge in reporting a change in energy use behaviour and/or energy efficient measures (e.g. purchase of equipment or more efficient behaviour) that would be expected to lead to a reduction in energy use they all assign to use of the tool.	At two sites, more than one user was consulted, but they converged in their opinion that the tool had not led to any energy use behaviour change.	0 <sup>26</sup>
One user reports a change in energy use behaviour and/or energy efficient measures (e.g. purchase of more efficient behaviour) that they assign to use of the tool and can describe the causal chain that led from tool use to behaviour change (e.g. "after seeing X on the tool, we understood that we were wasting energy when we X,	At one site visited, the user consulted had found Untapped useful and had benefitted from it attributing various changes in energy use behaviour within the school to use of Untapped.	2 <sup>27</sup>

<sup>25</sup> This group of evidence could be rated as either "not evident" (0), evident at 1-2 sites (2), evident at more than 1-2 sites (4) or evident at most sites consulted (6).

<sup>26</sup> This group of evidence could be rated as either "not evident" (0), evident at 1-2 sites (2), evident at more than 1-2 sites (4) or evident at most sites consulted (6).

<sup>27</sup> This group of evidence could be rated as either "not evident" (0), evident at 1-2 sites (2), evident at more than 1-2 sites (4) or evident at most sites consulted (6).

so we stopped doing X).		
Behaviour change reported via survey assigned to use of tool	Only one survey response was received, but it did not suggest behaviour change that could be assigned to use of the tool.	0 <sup>28</sup>
<b>Theory-based evidence</b>		
Evidence of the assumptions considered necessary for change to occur (as per the theory of change) occurring as anticipated (thus suggesting all of the necessary conditions for energy savings are available).	For all sites consulted, it was also possible to test the assumptions underpinning the overall Untapped theory of change. The results of this analysis were presented in Chapter five and they suggest that several of the assumptions underpinning Untapped had not held true in practice except at one site.	1 <sup>29</sup>
No evidence of alternative theories of change for observed, reported or hypothesised energy savings.	Across most sites visited, the potential for other factors to be driving any changes (e.g. change in building/business operating hours or reduced building use) observed was investigated and was found to have had greater impact than use of Untapped.	0 <sup>30</sup>
<b>Overall score</b> (max. of 37.5) <sup>31</sup>		<b>3</b>
<b>Averaged score</b> (max. of 4.5) <sup>32</sup>		<b>0.38</b>
<b>RAG rating</b>		<b>Low</b>

<sup>28</sup> This group of evidence could be rated as either “not evident” (0), evident at 1-2 sites (1), evident at more than 1-2 sites (2) or evident at most sites consulted (3).

<sup>29</sup> This group of evidence could be rated as either “not evident” (0), evident at 1-2 sites (1), evident at more than 1-2 sites (2) or evident at most sites consulted (3).

<sup>30</sup> This group of evidence could be rated as either “not evident” (0), evident at 1-2 sites (1), evident at more than 1-2 sites (2) or evident at most sites consulted (3).

<sup>31</sup> The maximum overall score differs for some Competition projects as some of the evidence types are not available for some project evaluations.

<sup>32</sup> This is calculated by dividing the maximum possible overall score by the number of evidence types considered (8 in this case) and rounding to the nearest 0.5 decimal.

**Table 1 (repeated): Energy savings confidence ratings (Untapped rated 0.38)**

<b>0- 1</b>	<b>Low level of confidence that the tool has contributed to energy savings at any site*</b>
1 – 1.99	Medium level of confidence that the tool has contributed to energy savings in at least some sites
2 – 2.99	High level of confidence that the tool has contributed to energy savings in at least some sites
3 to 4.5	Very high level of confidence that the tool has contributed to energy savings in at least some sites

*\* A low level of confidence does not preclude the tool from working in the future, if some adjustments / lessons learned are taken on board.*

## Annex 3 Further detail on Untapped design challenges

Two features were meant to be offered on Untapped, but could not be developed:

- **Open platform:** Untapped intended for teachers to take ownership of the tool and the educational materials offered on the platform. This was to be supported by an open platform - hosted on Untapped - that would enable teachers to share their experiences and exchange tips using the materials. The idea was to foster peer-learning and a sense of 'community' amongst teachers. However, over the course of Untapped roll-out, it was decided that this feature would be put on hold until other issues – considered more critical- were resolved (including in accessing data, onboarding and engaging schools). As of the date of report completion, this feature has not been developed, and associated outcomes are out of scope of this report.
- **Benchmarking and modelling:** Untapped was designed to build upon City Science's 'Energy Efficiency Intelligence' platform; an existing web-based software application for organisations to view and analyse their energy use. With Untapped, Hoare Lea and its consortium partners aimed to add to this platform by integrating three datasets from other parties (UCL and the Condition Data Collection programme). However, access to two of these datasets proved to be no longer possible and the quality of data in the third created challenges for integration. Specifically:
  - City Science intended to compare smart meter data with data from University College London (UCL) to provide an estimate energy wastage model and improve the overall analytics on the Untapped platform. The SimStock Schools database, from UCL, was to be used as the basis to develop 'model' gas and electricity profiles for schools in order to highlight relative performance. However, the data provided proved to be incomplete and/or outdated. Not all schools that piloted Untapped were represented in the database, and Unique Reference Numbers (URNs) listed for schools on the UCL database were out of date, leading to schools not matching their URNs. Furthermore, several values were estimated instead of actuals, and the dataset made simplified assumptions in instances which prevented accurate conclusions on individual buildings.
  - In a separate research project, UCL collated Display Energy Certificate (DEC) data from buildings across the UK. The Chartered Institution of Building Services Engineers (CIBSE) was to make this data available via an API that would allow the automatic recovery of benchmark data. Hoare Lea hoped to use this to be able to compare energy efficiency of an individual school against another, comparable school. However, the API, initially meant to be available in January 2019, was still in the beta testing phase as of March 2020.
  - Finally, data from the Condition Data Collection (CDC) Program, collected by the Education and Skills Funding Agency (ESFA), were not available. The CDC program was a high-level collection exercise to gather condition data about the school estate. Hoare Lea intended to use this data to improve Untapped's benchmarking service, as it would help automatically contextualise energy data. Access to the CDC data was requested as early as March 2018, but after two

proposals were submitted to Government in August 2018 and August 2019, no access had been granted as of March 2020.

These challenges prevented the intended 'benchmarking and modelling' feature of the tool from being developed. Several users indicated that benchmarking between schools could be an improvement and key added value of the tool in the future.

There can be significant challenges and high risks associated with trying to use and merge existing datasets from different organisations for the profit of a new solution. The risk is particularly high if the output of this venture is meant to be a key added value of the solution under development. A recommendation for BEIS would be to look out for, and mitigate, such risks at the onset of the innovation competitions and during project selection.

## Annex 4 Screenshots of Untapped

The following are screenshots of the Untapped tool- notably its website- included to illustrate the tool and its functionalities.

**Figure 4: Screenshot of a 'demo' dashboard (Source: Untapped's website)**

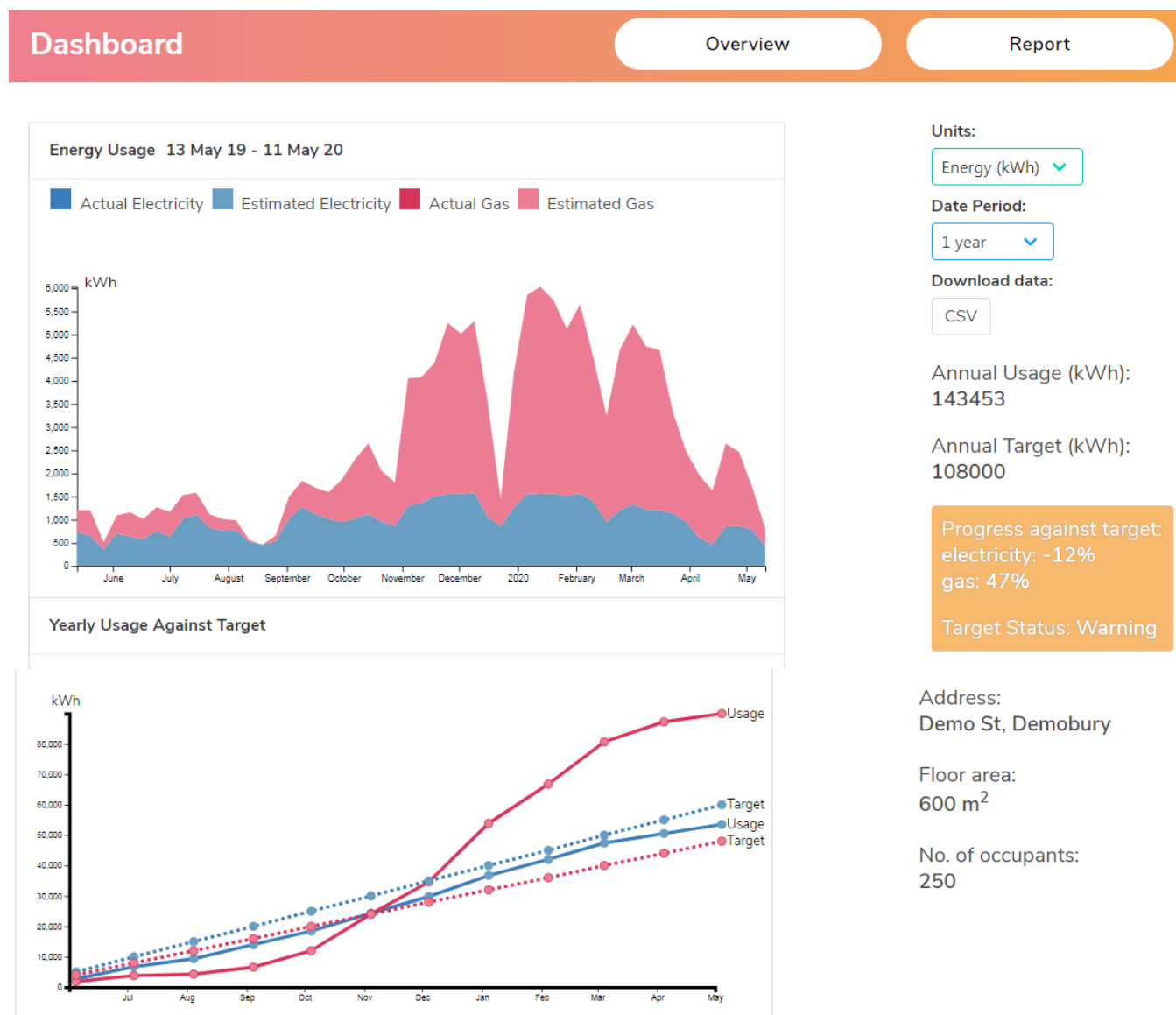
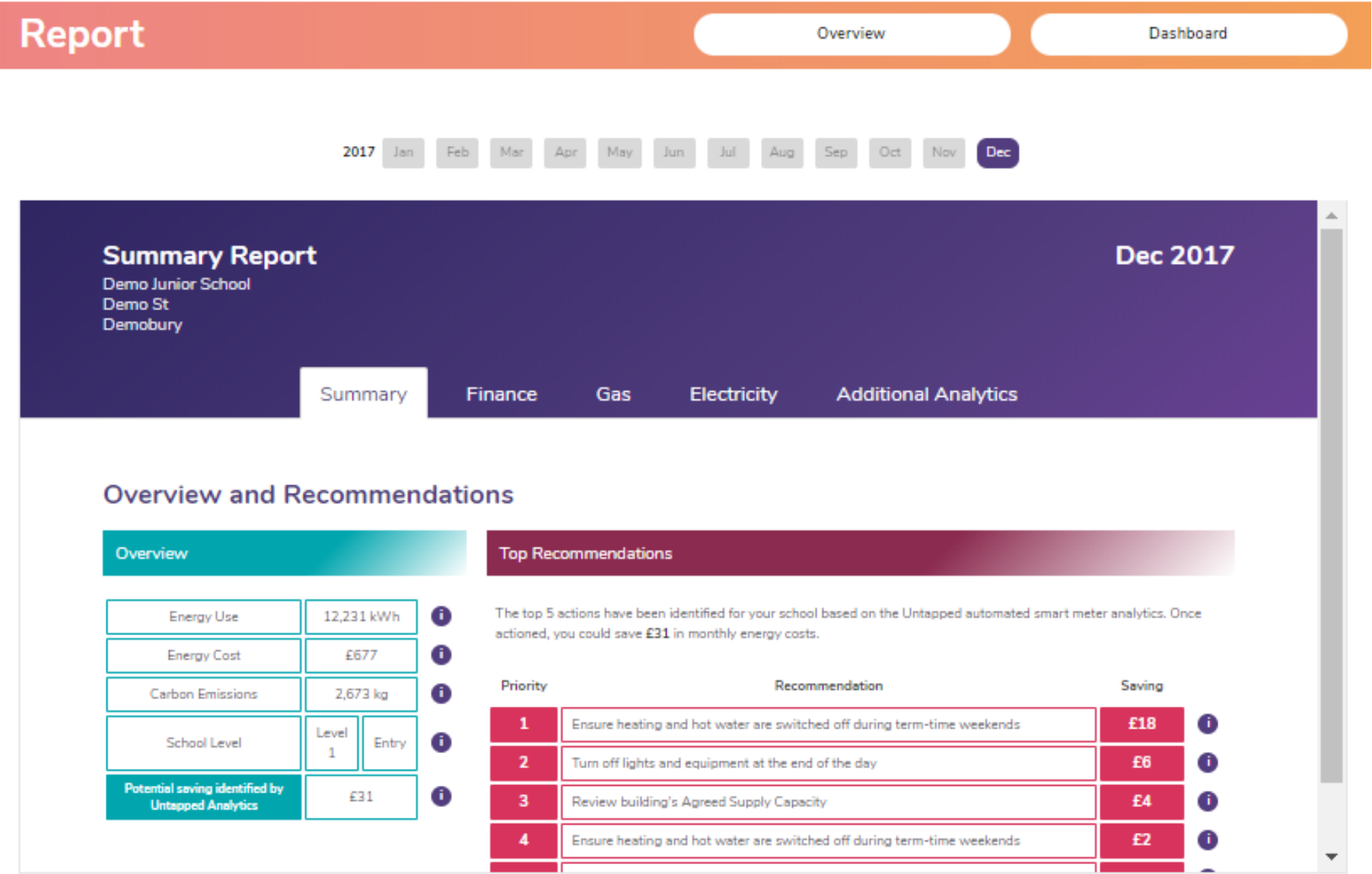


Figure 5: Screenshot of a 'demo' dashboard (Source: Untapped's website)





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