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On the path to net zero

ASK4



SPIKE



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Executiv Summary

Achieving net zero and other sustainability targets in the residential sector will only be possible if we tackle the longstanding challenge of reducing resident energy and water consumption and encouraging a range of 'green' behaviors. However, this often seems like an impossible task – after all, residents are in fact customers, and so how do we encourage behavior change without infringing on the resident experience and personal choice? This report reviews the latest thinking around what works when it comes to encouraging more sustainable behavior in the context of residential properties. It also draws on insights from behavioral science as well as residents, those working at an operational level, and our own experiences in the field.

Key findings include:

Potential for significant reductions

The research highlights that working to change behavior of residents can reap significant rewards. For example, strategies that tap into the natural human instinct to conform to social norms - such as providing feedback on consumption and comparison with others - can result in behavior changes that reduce carbon emissions in the region of 7%-35%. And that's just according to some more conservative estimates.

Multiple different approaches are needed

Behavioral change can only occur when individuals have the capability, opportunity and motivation to do so, and this is why strategies such as information campaigns often fall short – this type of approach only addresses one part of the equation. Incorporating this type of insight from behavioral science can help to ensure that strategies are targeted where they will have the greatest impact and yield the best results.

Understanding behavior is key

Taking the time to understand the reasons why residents, in spite of good intentions, behave in ways that are often at odds with these values is key to ensuring behavioral change is sustained. The reasons why residents often fail to follow up values with concrete actions are many and varied - ranging from feeling powerless to make a difference (especially when others around them are not doing the 'right' thing), a lack of comfort, a mistrust that their accommodation provider is genuine and authentic in their sustainability efforts. A lack of information on personal consumption in comparison to others also plays a crucial role.



Technology as an enabler

IoT and technology such as smart meters and sensors, with personalized data presented via resident apps, can enable building operators to maximize their residents' comfort, and identify 'outliers' in terms of consumption. The same technology can also provide the data needed to help residents understand their patterns of energy and water usage and compare themselves with others.

However, data on its own is not enough – energy and water consumption data is traditionally full of jargon and difficult for the average user to draw meaning from. The same technology can be used to present this data directly to residents in a way that is relatable (vital in helping to promote sustainability) and empowering.

Importance of community

Investing in developing a community not only enhances the resident experience – it can also lead to better outcomes. Residents are more likely to behave in a way that benefits the collective good if they feel an attachment to the place and community in which they live. Technology such as resident engagement apps can also play a crucial role in helping to build a sense of community by helping residents to feel connected to others as well as attachment to the place where they live.

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Sustainability is on the agenda for operators in a way that we have never seen before. This is not just driven by a desire to decrease costs in the context of escalating utility tariffs, although this is certainly a major concern. Instead, investors and consumers are placing increasing priority on environmental, social and qovernance (ESG) issues, and businesses are ramping up their net zero efforts.ⁱ

Despite this increased focus on sustainability, reducing operational carbon emissions, water consumption and waste in buildings continue to be obstacles faced by operators in achieving ESG targets due to the challenges involved in inspiring residents to engage in sustainable conduct.

And yet, we know that sustainability issues are important for all generations. In the US, for example, around 74% of people across all generations say that climate change and related issues are big enough problems that they would be willing to make at least some changes to their lives to help reduce the effects of climate change." There is also strong support for making personal sacrifices to reduce the impact of climate change, with international research highlighting that 65% of Millennials and 70% of Generation Z saying they would be prepared to make major changes to their own lifestyles.^{III} Despite these intentions, there remains a gap between values and actions that plays out in the form of unsustainable resident behaviors.

While reducing water consumption and waste are clear concerns for many, it is not surprising that energy consumption in the context of net zero carbon emissions targets dominates a significant portion of the sustainability conversation in the residential sector. There is a growing realization that encouraging 'green' behaviors in residents will be crucial if net zero targets are to be met, and that the time to act is now.

With this in mind, ASK4, Utopi and Spike Global have teamed up to review the latest thinking on how to influence resident behavior change and how technology can be harnessed to tackle this issue at an operational level.

As part of this project, we conducted focus groups with residents to better understand the barriers to engaging in more sustainable behavior. We also sought the views of those working in the field at Unite Students, Host Student Living, Student Roost and Yugo to gain insight into the ways in which these providers are tackling the behavioral change challenge. In this paper, we share the common themes that have emerged from our research and highlight a range of strategies that are proven to work, based on the latest academic insight, (including that of behavior change specialist from Sheffield Hallam University), Holly Willcockson, those working on the ground, and our own lessons from the field. While much of the research focuses on student housing, a lot of the insight gleaned is also applicable to the broader residential sector.

Why tackling building occupant behavior matters

Reduced emissions

Behavioral interventions have considerable potential to contribute to reduced carbon emissions, with some studies showing the potential for emissions reductions in the region of 7%-35% as a result of changes in occupant behavior.^{iv}

Decrease in utilities expenses

In the UK, the Energy Saving Trust recommends heating living spaces to 18-21 °C," Similarly, the U.S. Department of Energy recommends that thermostats be set to 68°F during the winter months." And yet, we have seen instances of apartments being heated to as much as 32°C/89.6°F.^{vii} In an electrically heated apartment, a difference in average temperature of just 3°C/5.4°F can double the amount of electricity consumed. Encouraging residents who consume excess energy to reduce their consumption in line with average consumers, has the potential to result in average savings of up to 35%.^{viii}

Changing consumer expectations

Sustainability issues are a concern across all age groups, however, among younger generations, this concern plays a key role in purchasing decisions. Generation Z in particular place high importance on brands that reflect their values, with up to 72% willing to spend more on goods and services produced in a sustainable fashion.^{ix}

There is emerging evidence that the priority placed on sustainability by Gen Z also extends to accommodation decisions. Recent research into what Gen Z wants from their living environment found that Gen Z places high value on being able to reduce their environmental footprint, and therefore prioritize a property's net zero energy, water, and carbon credentials when choosing where to live".*

So, it's easy to imagine a not-too-distant future where a property's environmental credentials and the property operator's ethos around sustainability may be the deciding factor for sustainability-savvy prospective residents.



+1670%

LESSONS FROM THE FIELD

At a Utopi student housing provider site, two identical electrically heated apartments were fully occupied. One was heated between 18-22 degrees Celsius/64.4-71.6 degrees Fahrenheit and the other to between 25-30 degrees Celsius/77 and 86 degrees Fahrenheit. The **overheated flat used 1670% more electricity in a 6-month period**. At 20p/24c per kilowatt-hour (kWh), the overheated flat cost the operation an additional £1,474/\$1,802 in electricity – equivalent to **1.65 Metric Tonnes of Carbon Dioxide**.

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"How residents behave directly affects our ability to hit our targets; without them on board, that net zero goal is unattainable. And in the midst of a global climate emergency, it's not enough if they just want to appear to be green. It is imperative that we drive major and long-lasting behavioral changes now"xvi

Educating for the future

In the PBSA sector particularly, working to influence resident behavior change may seem like a fruitless task – after all, many students move on after their first year. However, accommodation operators have a unique opportunity to contribute to global sustainability efforts by increasing residents' knowledge of responsible practices prior to them moving on to live in the private sector – which, of course, will be increasingly likely to be into the residential sector as the sector grows.

Student housing becomes the incubator for lasting sustainable behavior. Residents are often away from home for the first time and are forming new routines and new identities – a life stage when they are more open to developing new habits.^{xi} The behaviors developed during this period can last a lifetime,^{xii} and we see evidence that this understanding is influencing the way that some PBSA providers approach engagement with residents around sustainability initiatives. A senior representative of a large PBSA provider explains:

"Our approach is that it's not just about while students are living with us. It's about trying to really engender lasting responsible changes in behavior that they'll take on when they leave us because it's a really formative moment when students are moving out of home, moving into independent living. So, if we can help them adopt responsible behaviors we can have a much bigger downstream legacy impact than just focusing on when they're living with us."

Some argue further that increasing student energy/sustainability literacy is actually an ethical imperative for student housing providers as it reduces the likelihood of students experiencing fuel poverty when they move on from their student housing.^{xiii}

No better time than now

Now is the perfect time to try to tackle the value-action gap.^{xiv} The COVID-19 pandemic may have seen some sustainability initiatives temporarily take a backseat while keeping residents and employees safe became the priority. However, COVID-19 has also shone a spotlight on sustainability issues; the pressure to hit net zero is mounting, the sustainability conversation has reached the mainstream,^{xv} and we have a new generation of residents who are deeply concerned about sustainability issues and eager to make a difference.

Balancing net zero and the resident experience

Building operators face an ongoing balancing act in trying to meet net zero and utility cost targets without infringing on individual choice or negatively impacting the resident experience.

LESSONS FROM THE FIELD

A single electric panel heater introduced into a room with a wet central heating system at a Utopi client site caused the electricity use in that room to be 4.6 times higher than the average consumption in all the other rooms over a four-month period, equating to an additional cost of £422/\$516 over the average user (at 20p/0.24c per kWh). This equates to 2,110 Kilowatt-hours and is equivalent to 0.474 Metric Tonnes of Carbon Dioxide. In the remaining rooms at the site, there was a variance of up to 63% in electricity usage, indicating a significant opportunity to target outliers.





In particular, energy consumption is an area that has the potential to significantly contribute to reduced emissions and utility cost targets if behavior can be systemically and sustainably changed. Despite this, excess energy consumption is one of the most frequently cited sources of frustration, something that is especially true in the PBSA sector.

Anecdotes around rooms being heated (sometimes as high as 32°C/89.6°F) and practices such as running heaters and fans in addition to central heating, opening windows while the heating is on, or putting on the air conditioner instead of opening windows when it is warm, are commonplace. Not only that, but in some residences, they are the only way students have of managing their ambient temperatures.

However, despite the benefits to be gained from reducing consumption, it is clear that this is an area which is extremely challenging to navigate. Building operators, particularly those in the PBSA sector, where commercial success depends on providing a residential experience in line with higher rents, recognize that punitive approaches are unlikely to work. These operators must therefore balance the need to try to meet carbon emissions reduction and energy cost targets as well as student expectations. This can be difficult if residents are not brought along on the journey:

"On the one hand, we've got to provide that warm comfortable environment, but also we've got natural carbon commitments, and we've got huge energy costs. So, we need to do everything we can to make the heating as efficient as possible. It's not about rationing heat or not letting the student be warm. It's about helping them be warm and comfortable in the most energy-efficient way. Most student accommodation providers will use some sort of automated controls for that... but those only work if the student buys into it. If the student decides that none of those work and will not keep them comfortable, then typically they'll just turn the radiator off at the wall and go out and buy a fan heater, which they'll just plug in 24/7. So, it's as much about trying to engage them in a way that's positive and meaningful rather than being punitive and being seen to dictate what they can and can't do."

PBSA PROVIDER

All-inclusive rents

The existence of all-inclusive rent models is acknowledged as exacerbating the issue in the residential sector, as residents often have no financial repercussions for excess water and electricity consumption. In fact, research highlights that residents who have electricity included in rentals without an electricity cap may use up to 35% more electricity than those in accommodation where utilities are billed separately.^{xvii} The problem is that all-inclusive rents are a key selling point for property operators. In the PBSA sector in particular, all-inclusive rents are highly valued by students in some markets. Evidence from the UK for example, suggests that up to 70% of students consider all-inclusive rent to be an important factor when choosing where to live.^{xviii}

Our conversations with students suggest that the existence of all-inclusive rents may mean that they receive conflicting messages around energy and water consumption, causing some doubt over whether sustainability goals are genuine:

"The first day that I moved in, I was asking about certain things, like leaving lights on. And the woman who was showing me around, she said, you don't have to pay anything else for the rest of the year. Just do whatever you want. And that type of attitude contributed to the way that I took showers or left things plugged in. Taking long showers is one thing that I feel like I've had the liberty to do when I because I didn't have to pay the water bill."

INTERNATIONAL STUDENT, PBSA

The obvious answer is to unbundle utility bills from rental prices. In markets where all-inclusive rents are a key selling point, providers are reluctant to do so as things stand however, for fear of losing a competitive advantage.

Another option is to implement a fair usage policy. This is seen by many as a middle-ground solution and an approach that has been adopted by some US operators who have invested in smart metering. However, the reality is that many properties across the sector still do not have the smart metering or reporting capabilities that enables them to quantify energy usage at the individual unit level:

"But you need the metering to be able to tell people what they're consuming. You know you are in February – now you've used £250 worth. You're going to be charged once you hit £1000 let's say for an example."

PBSA PROVIDER

Anecdotal evidence suggests that some properties advertise a fair usage policy, but operators are reluctant to charge for excess consumption based on dividing floor or building level meter data by the number of apartments or individuals. There is also recognition that this approach may penalise residents who do not consume in excess and can give an inaccurate picture of individual use. It also misses the opportunity to target outliers, which can include up to 40% of occupants.^{xix} There are some indications that the conversation around a more targeted approach using individual metering may be revisited sooner rather than later though, as more companies chart their path to net zero:

"We're doing a lot of these trajectories to net zero audits ... those audits will almost certainly recommend local individual level meters for electricity, water and heat."

PBSA PROVIDER

The issue of all-inclusive rents aside, property managers also face challenges in trying to achieve the right balance in terms of encouraging rather than coercing pro-environmental behaviors, while being respectful of the fact that residents are young adults who are paying to rent their accommodation:

"But obviously balancing against that is the fact that this is a student's home. This is where they're paying to live. And you know, they're not in their childhood home where they're being told, 'Do this, do that.' And we are keen not to have that sort of parent-child relationship." PBSA PROVIDER While reducing energy consumption is the major priority for property owners, reducing water consumption and waste are also key concerns and areas where operators are anxious to bring residents along on the sustainability journey with them: "The more we educate everyone we're involved with, even our onsite teams, like groundskeepers and housekeeping who are part of our team for instance, the more success we will have. So, everyone onsite definitely goes through all the same training that we do."

PBSA PROVIDER

Barriers to change: why residents behave the way they do

Although individual awareness still matters a great deal - because this makes change easier - it is rarely enough to inspire behavior change on its own.** There are many factors that get in the way of taking action and it is important to understand why people behave the way they do in order to be able to effectively encourage behavior change.

Behavior varies across individuals, organizations, settings and countries, so influencing behavior change requires situational assessments to understand behavior in context. However, at a broad level, some of the barriers getting in the way of pro-environmental behavior include the following...

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and awareness. For example, with a

individual might not engage in pro-

are unaware that climate change is

climate change is an issue but don't

could take as an individual to help

"And then what else can you do to

reduce your consumption? But of

the dorms don't do that."

course, we can only know that if they

INTERNATIONAL STUDENT, PBSA

make us aware of our consumption and

lessen its impact:xxi

occurring, or they may be aware that

have information about the steps they

major issue such as climate change, an

environmental behavior because they

Individuals often feel powerless to take

Feelings of powerlessness

Lack of awareness Although difficult to imagine given the current focus on sustainability issues, an individual may be lacking in knowledge

difference.

"I do what I can. I always recycle. I try not to waste energy- turn the lights off, and small things like that. But I guess if everyone does that, it will help. But the big changes are not things that we individually can do, which is quite frustrating, but you try." STUDENT. PBSA

"I just feel really overwhelmed and it feels really scary. It doesn't feel like there is anything like I can do. So, it's just really scary and big and overwhelming." STUDENT, PBSA



Beliefs

Beliefs about perceived threats to individual freedom and the right to a comfortable lifestyle (particularly in Western cultures)^{xxiii} can reduce an individual's motivation to engage in pro-environmental behavior:

"I mean, we're grown adults. If someone's telling me how to take a shower when I'm 24, then no, I'm not going to live here". STUDENT, PBSA

Interestingly, our discussions with students highlighted that beliefs about rights and individual agency impact whether, at least in the context of student accommodation, residents would feel comfortable trying to influence others to behave in more environmentally responsible ways:

"There was one of my flatmates, and his whole ideology was that if, unless everyone does it, it doesn't matter. So, his idea was that he just wouldn't bother, which is really annoying. The worst thing is, it doesn't matter how much you go on at someone, if they're an adult, they can make their own choices." STUDENT, PBSA



Present bias

The consequences of our current consumption habits can be difficult to quantify or properly understand without immediate feedback. Exacerbating this is 'present bias' – a natural tendency to disregard or underestimate things that will provide long-term value and fall back on the things that give us instant gratification or are the easier choice at that particular moment. For example, leaving lights on when leaving a room does not have an immediate cost, and so it is easy to discount the positive consequences of putting an end to this habit in favour of what's easy.

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Social norms and comparisons

As humans, we frequently compare ourselves with others. This includes comparison of our actions with those of others to determine the "correct" behavior when it comes to the environment. If individuals believe that those around them are not engaging in pro-environmental behavior, then they themselves are less likely to engage in pro-environmental behavior. The converse is also true – individuals will also change their behavior to "match" others in a positive way, in order to avoid the disapproval of their peers for example, altering energy consumption to replicate the reported usage of their neighbours.xxiv

"You need to compare with something or someone. Without comparison of how you are doing, you don't know how to interpret your usage".

CO-LIVING PROPERTY RESIDENT



Physical Opportunity

Pressures related to time and the level of convenience of a particular action are common reasons why individuals go back to unsustainable habits.^{xxv} For example, an individual may find it annoying and inconvenient to recycle if they do not have easy access to recycling. For example:

"You go to the effort of doing it, and then you get there to put it in the recycling bin and the recycling bins are all locked, and you're like, oh, great, now we've got to dump it in the normal bin." STUDENT, PBSA

And, if pressed for time, they may choose to use their car rather than wait for public transport.



Sunk Costs

Sunk costs are the financial and nonfinancial investments we make that get in the way of, or facilitate, adopting alternative behaviors - car ownership, for example, may make it less likely for an individual to consider using public transport.

Habits are also considered a sunk cost because they are difficult to change. Also included in the category of sunk costs are conflicting goals and aspirations which may conflict with our goal of not doing harm to the environment. ^{xxvi} Place attachment is also considered a sunk cost. Environmental Psychologist Dr. Robert Gifford explains that "those who love the place in which they live are more likely to take care of it. Conversely, those with less attachment to the place where they live are less likely to act in proenvironmental ways." ^{xxvii}



Expectations of comfort

Our natural instinct is to take adaptive actions to secure our comfort, and this varies according to individual preferences. So, people will either adapt the environment to suit their needs (opening or closing windows, adjusting thermostats, operating personal heaters or fans), or they can choose to adapt themselves to the environment (adjusting clothing).xxviii

"Even when we did use the heater, it didn't really have adjustable settings, so it would just be either definitely hot or you don't use it. You had to open the window."

INTERNATIONAL STUDENT

"I just leave my window open all the time. You have to" STUDENT. PBSA

Gifford explains that "those who love the place in which they live are more likely to take care of it. Conversely, those with less attachment to the place where **"It's just really hot and stuffy all the time and people are bringing in AC units and everything and running them all the time."**

STUDENT, PBSA



Mistrust

If pro-environmental behavior change programs are perceived as lacking authenticity or ineffective, then individuals are unlikely to participate.xxix Our discussions with PBSA residents highlighted repeatedly that the way their accommodation provider approaches recycling, for instance, influences the level of trust that they have in their accommodation provider when it comes to sustainability initiatives more broadly. If recycling programs are perceived as being tokenistic or ineffective, then residents are likely to have reduced trust and reduced motivation to engage in proenvironmental behaviors.

"I try to recycle but when I go to the litter room, it feels like nobody else is recycling - everything is mixed together. So, it's frustrating. ... You have three different kinds of bins and then you try to do it, and then, in the end, everything is mixed up, so you do not feel motivated to do that again." STUDENT, CO-LIVING SETTING

"I was talking to a friend of mine who knows the garbage collection people who service our student accommodation. And she was saying that they just put it all in the landfill pile because they don't trust students to recycle. They don't trust us to separate it. And it only takes a little bit to ruin a whole dumpster. So, it all goes straight to the landfill and so it makes it feel really pointless."

STUDENT, PBSA

PROVIDER SPOTLIGHT

Host Student Living

Host Student Living is responsible for the development, operation and management of more than 12,500 student beds in over 25 cities throughout the UK and Europe.

Host Living asks students to make an annual #HostEnvironmentalPledge to make a change to help protect the environment. Whether it's turning off appliances when not in use, taking shorter showers or turning lights off when leaving a room, these small actions can reduce energy usage; which in turn will reduce the levels of greenhouse gas emissions being released into the environment. Host have expanded the campaign to encourage students to make changes beyond energy usage in areas such as recycling, using reusable items, travelling responsibly, buying less plastic, buying sustainable products. If Host properties reduce overall consumption by 1% then Host donates £10,000 to charity. If there is a 2% reduction, Host will then donate £20,000, 3% results in a donation of £30,000 and so on.

Host has found that tying action to a charitable outcome helps engage students who are more likely to be motivated by the thought of taking action that contributes to a greater good.

Source: Host Living

ASKA UTOPI SPIKE



How behavioral science can help

There is often a gap between what we would ideally like people to be doing (or what they might intend to do) and what they actually do. Behavioral science can shine a light on why this might be and provide insights and intervention ideas that could move the needle in terms of sustainable behavior change.^{xxx}

The challenge, of course, is understanding what is driving specific behaviors in a specific context and deciding which behavior to target. Behavioral science can help us systematically analyse the behavioral problem(s) so that the most effective behavior change interventions are chosen (see Appendix).

ASKA UTOPI SPIKE



The COM-B model of behavior change

The COM-B model of behavior change, previously used with success in the public health arena, is increasingly being used to support pro-environmental behavior change. The basic premise of the COM-B model is that for an individual to perform a particular behavior, they must:

- Feel psychologically and physically capable (C) - having the appropriate knowledge and skills to perform a behavior;
- Have the social and physical opportunity (O) - being supported by peers/norms and having the right resources/time; and

 Be motivated to engage in that particular behavior more than other possible behaviors – having beliefs, intentions and impulses that support a certain way of behaving (M).

Because each of these components interact, any strategy aimed at delivering and maintaining effective behavior change must target one or more of these to be effective. It is crucial that this is done in the context of discussions with the target population, to gain insight into their main barriers to engaging in a particular behavior.

The value of the COM-B model is in the process of listening and asking the right questions to understand the drivers of behavior. This enables us to address what is actually stopping people from doing what we want, rather than addressing what we think the issue is. " I know that they did do an incentive thing. I don't know if they did it every year, but I remember they said "We'll see who is using the lowest and who's living the most efficiently for a month, and we will give you a discount off your rent". So that was quite a good incentive. I don't know how they actually measured it, and I have no idea how they worked it out, and I don't know if I really trust them to do it correctly or if they just picked a random flat and all that, and said yeah, you win. But it's quite a good idea if they can do that properly."

PBSA STUDENT

"if I had a meter in my room and I knew how much I was using, I could interpret what that means. And if there's a financial incentive as well, 100% I'd reduce my energy usage."

INTERNATIONAL STUDENT, PBSA, NEWCASTLE

Getting Results – Think E.A.S.T

Behavior change experts also stress that strategies are more likely to be successful if they employ the E.A.S.T principle – that is, if strategies are Easy, Attractive, Social and Timely (E.A.S.T).^{xxxi} Of course, it is important to remember that an EAST strategy that targets a barrier that doesn't exist from the perspective of residents won't actually tackle anything. That is, the E.A.S.T principle has to be applied to the strategies most likely to address the specific barriers of your target group. (see Appendix)

For example, if in a particular property, poor recycling practices have been identified as an issue, an attractive poster campaign around the importance of recycling is unlikely to engender significant behavior change if lack of knowledge is not actually the driver of the poor recycling practices.

Discussion with residents may reveal that though they are aware of the importance of recycling and know what they need to do, the physical opportunity to recycle is a barrier - ie. recycling is seen as too difficult because the garbage bins are too far away. As such, an intervention to change the physical environment, making recycling more convenient is more likely to obtain the desired results.

"What we do now on every floor of the building, is you have a smaller bin store. So, it means that the result is you should have a short 10-second walk to put your rubbish in rather than taking rubbish all the way through the building and going to the bin store. And what we have found is that people are a lot more responsible about recycling, putting stuff in the correct bins and stuff like that because it's been incorporated into their lifestyle. It's made it painfully easy for them to do that."

ARCHITECT



E.A.S.T. with Resident Engagement Technology

Resident engagement technology takes much of the effort out of ensuring behavioral change initiatives are Easy, Attractive, Social and Timely. For example:

Easy – resident engagement technology can make action easier to take by providing information updates, practical tips and hints and information such as the location of recycling bins, and tips regarding small behavior changes that can have a major impact.

Attractive – Personalised messaging is more likely to motivate individuals to act. Resident engagement technology attracts residents' attention by providing personalised updates and information.

Social – resident engagement technology can be used to tap into our desire to fit in by showing individual performance in comparison to others or to make a commitment or pledge to others.

Timely – prompts can be provided when residents are most likely to be receptive.

E.A.S.T Strategy Examples

Intervention Type	Example				
Easy	Make the most sustainable behavior the default – e.g. default to eco settings on appliances and electronics				
	Reduce the effort required to perform an action (e.g. proximity of recycling bins)				
Attractive	Install smart meters for electricity, gas or water that show real time consumption and information on the associated costs – this makes the impacts of consumption obvious and personally relevant.				
	Personalised messages – address communications to individuals by name and tailor them to specific circumstances or interests, or tailored information via a resident engagement app.				
	Use incentives – people can be motivated by financial rewards and savings, including gamified monetary incentives or non- financial incentives such as public recognition.				
Social	Use positive messages that will make the target audience feel good about themselves. Highlight the co-benefits of a sustainable behavior such as how it will save people money or make them healthier in addition to conserving natural resources.				
	Campaign with a message of positivity, avoiding a tone of guilt or reprimand. For example, tap into people's sense of group identity and belonging to foster pride.				
	Use of technology such as a resident engagement application to encourage residents to make behavior change pledges or compete against each other and share the positive results arising from the desired behavior changes.				
Timely	When a resident first moves in, they are more likely to be receptive to behavior change because their habits have already been disrupted through the major event of moving.				
	Receiving prompts (e.g. via a resident engagement app) at the right time of day ¹ may also increase the likelihood of a resident engaging in the desired sustainable behavior.				

1 A study conducted in some student dormitories at Monash University in Australia found that providing residents with some normative feedback (feedback on how their use compared to a baseline) before a peak usage period made a difference to levels of electricity consumption, compared with the provision of information about energy saving tips. However, the timing of the prompt was also important: "a reminder 8 h prior to the critical peak period had a greater influence on energy reduction than a two-time notification at 24 h and 2 h prior to the peak and no notification at all". See: Jorgensen et. al, 2021.



CASE STUDY

E.A.S.T Principles in Action – The SAVES Project

In 2017, the SAVES Project in alliance with the Student Switch Off campaign, ran a competition to save energy between student dormitories all over Europe, amounting to over 50,000 participants. The campaign focussed on behaviors such as switching off lights and appliances, putting a layer of clothing and not the heating, boiling only as much water as needed and opening windows instead of putting on air conditioning (in hot climates).

"Winning" dormitories were offered an incentive in the form of a celebration, and a number of community-building activities took place to help students feel like they were part of a larger community. The SAVES project demonstrates that with effective resident engagement alone, 7% could be saved on energy bills.

Interestingly, the main reason (cited by 56% of respondents) as to why they were not more energy conscious was because they had little or no feedback on their personal energy consumption.

Students were able to see how much energy their dormitory was saving through a specifically developed online dashboard.

The SAVES project only had access to main meter data, and competition amongst different dormitories – project evaluation highlights that more personalized data is likely to have resulted in even greater savings.

Source: Switching off? Challenges in engaging students in energy efficiency



PROVIDER SPOTLIGHT

Yugo

Global student housing operator Yugo aims to support students throughout and beyond university life. Yugo provides support to students through three pillars based on sustainability (YugoEco), education (YuPro) and personal development (YuGrow). "As part of the YugoEco pillar, Yugo has launched a carbon literacy program to its students and workforce. This will raise awareness of climate change and the impacts of everyday actions – a globally unique initiative. ... The online training initiative will tap into an area which students feel is neglected according to Yugo's research and build a better future for the planet, with carbon savings of 5-15% per person."

Yugo has achieved Bronze Level Carbon Literacy as an organization and aims to achieve Silver Level Carbon Literate Organization status in 2023.

Yugo has also launched the Yugo Movement as part of the YuPro pillar. The Yugo Movement is a student council focussed only on sustainability. Students have just one mission - to eliminate single use plastic in Yugo spaces.

Source: Yugo launches to over 35,000 students worldwide

The importance of communit technology and authenticit

highlighted three things that can positively contribute to changes in behavior.

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Community

Feelings of community and belonging play a role when working to engage individuals in pro-environmental behavior change. This can be facilitated via design features as well as by deliberately working to foster collaboration and attachment to place.

Students told us how a sense of community was more likely to motivate them to make positive behavioral changes:

"I think it really depends on how strong the community is. So, if everyone is isolated and doing their own thing and you do not really know each other, and you do not have any contact, then it really doesn't matter what they think of me or how I think about them. But, if there is a community influence or vibe, I think that can really encourage all the environmentally friendly behaviors as well."

STUDENT, CO-LIVING SETTING

Building operators stressed the important contribution that community plays in their efforts to encourage residents to engage in proenvironmental behaviors:



"I think it's the most important aspect of it, that community feel, and it gives you a sense of being in that space to get involved". PBSA Provider

Building experts highlighted the important contribution that design features can make to promoting a sense of community:

"Community is about collaboration ... It might be you've got a kitchen garden, you might have an outdoor barbecue area, or you might have a nice kitchen dinner type arrangement so people can share that space together ... Cooking and eating together is a really, really good way to build community. Growing things together, anything that's common goal-driven where people can bring different skills to the table and feel like they're contributing something." ENGINEER

TECHNOLOGY IN ACTION: **MODA LIVING**

Founded in 2014, Moda Living is a "pioneering build-to-rent brand that has a pipeline of 18,400 homes across the UK, from Brighton to Edinburgh, ranging from state-of-the-art city centre build-to-rent neighbourhoods to suburban family homes."

While rents are not inclusive of utilities in Moda Properties, Moda has a strong focus on sustainability, and aims to achieve net zero operational carbon by 2030. In its quest to achieve this, in 2020 Moda Living partnered with Utopi and Spike Global to develop a comprehensive digital infrastructure and optimise smart building technology across Moda's entire portfolio.

All Moda homes are fitted with Utopi sensors that measure environmental factors including temperature, air quality, light, noise, occupancy wellness and energy usage. Sensors automatically respond to adjust the environment to exercise real-time control of air-conditioning, security and lighting systems to optimize the space for residents and saving money on energy costs. Instant alerts are issues for any identified maintenance and utility issues. This significantly reduces the need for disruptive maintenance work and improves the resident experience.

Residents can access this data in real time, enabling them to check how their space is performing.

Residents are encouraged to interact with their data via gamification and can (anonymously) track where their sustainability ranks in their neighbourhoods, which has many applications for incentives to drive engagement. The platform also provides tips on small changes that could have a big cost impact.

Source: Moda Living - The Moda and Utopi Partnership



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Although the link between a sense of community and pro-environmental behaviors is an under-researched area, there is evidence that supports these observations. Fostering a sense of community and attachment to place and to others increases the effectiveness of behavior change campaigns in relation to both energy saving and recycling, for example.xxxii xxxiii This is because when individuals feel that they belong to a community or want to fit in to that community, and their identity is partly attached to it, they are more likely to act in a way that benefits the collective good.xxxiv

Sheffield Hallam University Behavior Change Researcher Dr Holly Wilcockson explains:

"Having peers who engage in environmentally friendly behaviors and building a culture of behavior in responsible ways seems to be an important consideration for a lot of the students. Leaving home for the first time and wanting to fit in and make good impressions on those around them is likely to further drive this point. Interventions that promote culture building and normalising environmentally responsible ways of living are likely to result in positive changes".

Technology

Internet of Things (IoT) and other technology can play a key role in facilitating pro-environmental action by making certain behaviors easier for residents as well as giving occupants and operators alike the information they need to make decisions and change behavior.^{xxxv}

For example:

- Sensors can track movement and occupation, and help building operators understand when room temperature is not optimal so that operational adjustments can be made automatically, minimising the likelihood of occupants wanting to adjust their own environment.
- Smart meters combined with a dashboard (e.g. on a mobile application) increase awareness of residents of their consumption, and can promote peer comparison and tailored messaging around opportunities for more sustainable behavior.xxxvi
- Resident engagement technology can help to foster a sense of community and attachment to place and to others, as well as empower residents by providing relevant, relatable information. Research highlights that presentation of data in terms of direct energy units such as kWh or in terms of CO2 emissions is difficult for users to understand.xxxvii However, a resident engagement portal can present resident usage information in relation to others, demonstrate impact and employ gamification techniques to motivate residents. Examples include the amount of energy used compared with others on the same floor or in the building, the amount of carbon used in a 10-minute shower, or how much energy is saved by turning the heating down by one click.



PROVIDER SPOTLIGHT AMERICAN CAMPUS COMMUNITIES

American Campus Communities (ACC) places a strong emphasis on engaging residents around sustainability issues and bringing them along on the sustainability journey.

ACC undertook a Resident Pulse Survey in 2021 which sought resident views on sustainability issues, finding that 73% of residents believe it is "important to have sustainability features in their apartment community".

ACC's "For the Greener Good" campaign is aimed at encouraging good practices around utility and water use. Key elements of the program include:

- Providing environmental tips and information at move-in;
- Sharing energy and water information for residents to conserve their usage;
- Offering tips on reducing utility expenses; and
- Educating residents on the sustainability features of their community.

ACC has also taken the step of implementing a fair usage policy for utilities, noting that:

"Student housing has historically been provided as an all-inclusive utility housing. However, increasing concern about environmental awareness and resource consumption has created a shift in this market expectation. Financial responsibility for utility costs creates a vested interest for a resident to reduce consumption, and thus it has become increasingly standard to have residents pay their utility costs ... Residents are responsible for all or a portion of utility costs at over 80 percent of our owned assets, creating a vested interest for our residents to conserve energy. In markets where the landlord typically provides utilities, ACC often implements a utility cap, or maximum allowance for usage before the tenant becomes financially responsible. For many residents, it can be their first time being responsible for utility payments, so we share practical advice for how to minimize costs."

Source: ACC, ESG Report 2021 -Environmental





CASE STUDY – SMART METER ROI

A common misconception is that installation or retrofitting of unit-level smart meters is prohibitively expensive. However, the reality is that the typical ROI period is 2.5 years. Analysis of the payback period at five Utopi sites consistently demonstrated an average payback period of 2.45 years with a maximum of 2.5 years.

Manchester		400,000	600,000	£221.75	£42.00	47%	2.50	£369.63	\$455.34
				£220.00				£371.25	
Leeds		1,000,000	1,500,000	£219.10	£42.00	48%	2.42	£372.08	\$458.41
				£218.71				£372.44	\$458.94
London	1,000	2,000,000	3,000,000	£217.75	£42.00	48%	2.42	£373.33	\$460.06

*Hardware included at each site was an electricity submeter and Utopi Multisensor (including an IoT network)

Savings come from a reduction in overall energy consumption by using data from both devices to engage with residents and change their behavior. ROI came from an associated reduction in overall consumption by 15% in Year 1, 20% in year 2 and 25% in years 3-5.

Demonstrating authentic sustainability commitments to create culture

Our discussions with residents and industry experts highlighted the importance of ensuring sustainability efforts are genuine and that an ethos of commitment to sustainability permeates every aspect of operations - from the design phase of the building through to daily operations, and employee interactions with residents.

A US-based PBSA provider explained that while part of their success in lowering energy consumption was linked to implementing a fair usage policy for utilities across the majority of their properties, ensuring that staff at every level of the organization were educated about sustainability issues was also a key factor in their success:

"The more we educate everyone that we're involved with - even for our onsite teams, a lot of times we have groundskeepers and housekeeping as part of our team. So, they definitely go through all the same training that we do" PBSA PROVIDER

One building design expert explained how using opportunities to incorporate simple sustainability features such as beehives, or even just 'bee bricks' on the rooftop is a powerful tool in terms of demonstrating a genuine commitment to sustainability as well as helping to keep sustainability issues front of mind for everyone from the outset:

"There's basically holes for the bees to do their thing. But on the roof on some of [the buildings], we're looking at beehives and having that kind of ecosystem as part of the building because of the wider benefit."

ARCHITECT

Residents are unlikely to engage with sustainable behaviors if they do not see their building operator "walking the talk" by way of modelling the behaviors they wish to see and demonstrating a genuine commitment to sustainability issues. This highlights the importance of ensuring that all employees are brought along on the sustainability journey particularly those with resident-facing and facilities management roles.

"I think there's definitely a role model perspective to be had there from people managing a building saying, 'Look guys, this is how we expect it to be." PBSA

Again, for residents, one of the most visible indicators of their accommodation provider's commitment to sustainability is the way that recycling is managed. This then sets the tone for how residents view other issues such as energy and water consumption.

"I'm from Canada, studying in Ireland. We're not the best but we do care a lot about our environment because obviously, it's beautiful over here, beautiful in Ireland too. But they didn't have the same things. For example, I got used to separating out my recyclables in a very certain way. My flatmate is from Germany, and she was doing the same kind of things - and then we would get down to the bins and it's like no one cared."

INTERNATIONAL STUDENT, PBSA

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Utopi, Spike Global and ASK4: a seamless and integrated approach to ESG management

SPIKE

Spike Global – provides the software to promote resident engagement, fulfil the social needs of residents and display information about energy usage to residents with the aim of helping them reduce consumption.



Utopi - uses smart technology to collect live data from buildings, presenting it on easy-to-read dashboards, and engaging communities with a resident app that provides real, tangible, and contextualised information that allows building managers and residents to take action and move towards decarbonization, with the added bonus of reducing costs.



ASK4 - provides the network that a full range of Internet of Things (IoT) devices and technologies run on to be able to meet ESG targets. Partnerships and integrations mean that the client and end user receive a seamless experience when connecting their devices and receiving reporting and insights from the network.







Data collection

Utopi's SaaS Platform pulls live data directly from smart devices such as smart utility meters and IoT devices such as Utopi's lowcost multi-sensor which collects a range of wellbeing data on measures such as light, noise, CO2, temperature and humidity.

Analysis

This data is then analysed within context and presented in easyto-understand dashboards and reports. The inclusion of wellbeing data enables building managers to identify issues where resident comfort and wellbeing can be improved, which is likely to decrease those behaviors that result from resident discomfort.



Utopi's software also searches for anomalies in the data, and alerts building managers to potential issues such as unusual usage patterns which could indicate issues such as a leaking pipe.

Resident engagement

Spike Global's resident app engages residents using gamification, providing them with customised, transparent data giving them the information required to reduce consumption, and play their part in solving the climate crisis.



In Conclusion

Addressing the gap between good intentions and the actual behavior of residents in the residential property sector is a problem that can no longer be ignored. It is widely acknowledged that net zero targets are unlikely to be met without bringing residents along on the journey. The good news is that residents can be encouraged to engage in new, positive behaviors, in spite of the seeming complexity of the issue.

Behavior change science offers some simple yet effective tools that can support building operators in understanding the drivers of the behavior they seek to change, and in strategically designing interventions that will get results. IoT and smart technology such as sensors and meters, combined with visual feedback to residents, and technology designed to foster a sense of community and collaboration are powerful tools for identifying where best to direct efforts and engaging residents.

Technology enables data to be contextualized and presented to both users and building operators in a meaningful way. In addition, technology can play a key role in helping to build more trust and awareness around sustainable living, and in empowering users by sharing the actual real-time impact that individual usage can have.

Working to engage residents and encourage pro-environmental behavior will not only reap rewards in the form of reduced emissions and lower utilities expenditure – it also makes good business sense. Gen Z are passionate about environmental issues, and they expect those they do business with to share their commitment and values. Environmental considerations and assessment of an organization's commitment to sustainability and values factor strongly in purchasing decisions made by this cohort. They are more vocal and more active when it comes to social and environmental issues than the aeneration before them.

Ensuring that sustainability is not just a buzzword, but rather a way of living for residents and employees alike is also increasingly likely to be an advantage in the eyes of investors as we move closer to net zero deadlines.

Encouraging positive behavior change is no longer an optional activity. Our buildings are increasingly 'green', and of course, innovation in that area will remain critical. However, it is time to approach behavior change as a crucial part of the mitigation puzzle.


Deeper Dive: The Behavior Change Wheel

The Behavior Change Wheel (BCW) model was designed to help turn the COM-B model into action. It places the COM-B model's three components of capability, opportunity and motivation at the hub of the wheel (in green).

Surrounding the COM-B model are the intervention functions (in red) that can be used to create behavior change (see Figure 1). The grey outer wheel lists policy categories that may be used to change behavior.xxxviii Working from the centre of the wheel outwards, practitioners can make a thorough assessment of the problem and solutions.

Source: Michie, Susan, Maartje M van Stralen, and Robert West. 2011. "The Behavior Change Wheel: A New Method for Characterising and Designing Change Interventions." Implementation Science 6 (1): 42.

In Practice: Putting the Behavior Change Wheel into Action

1. Define

DEFINE the problem. What would people be doing differently if the problem were solved?

2. Select

SELECT an existing behavior to be changed. How much of an impact will the change have on the outcome? How likely is it that the behavior change will have a positive or negative impact on other related behavior(s)?

3. Specify

SPECIFY the desired behavior. WHO? Needs to do WHAT behavior? WHEN? WHERE? HOW OFTEN? WITH WHOM?

4. Identify

IDENTIFY what

needs to change. Is the existing behavior driven by issues with Capability, Opportunity or Motivation? Are there differences between sub-groups of residents? Data can be obtained by focus groups, interviews, questionnaires or building/IoT data.

5. Design

DESIGN content and implementation options. What types of interventions are likely to bring about the desired change? (See Deeper Dive: Choosing the Right Type of Intervention) What components should our intervention involve? How will it be implemented?

Example

ASK4

There is a problem of excessive waste in student residences which would be helped by students being engaged with using recycling bins.

Example

Recycling effectively would reduce waste and is likely to make students more conscious of living in an environmentally friendly way.

Example

Ideally, all residents will separate waste into recycling bins at the point of disposal.

Example

Talking with residents, current barriers to doing this include beliefs that this is futile as the waste is not properly disposed of further down the line (Motivation) and the bins are not in a convenient location (Physical Opportunity)

Example

We could increase resident knowledge of recycling processes and address their concerns through communicating the lifecycle recycling process as well as provide information regarding positive impact (Education) and make it easier by putting recycling bins on every floor (Physical Environment Restructuring)

Adapted from: Stuart-Smith, R., 2017, and Michie, Atkins and West, 2014

	-			~		A			Koy	
In order to promote:	Education	Persuasion	Incentives	Coercion	Training	Restriction	Environmental Restructuring	Modelling (examples for people to aspire to)	Enablement e.g. provide resources or services	
Capability					Ø		\checkmark	Ø	\checkmark	
Opportunity						\checkmark			\checkmark	
Motivation										

In Practice: Choosing the Right Type of Intervention

L N O N N O N N O N N O N N O N

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