MUSH!
Untapped Opportunities to Support Energy Decision Making
The Commercial and Industrial (C&I) side of energy is incredibly diverse, ranging from parking to restaurants to farms. In order to better serve business customers, utilities must first understand the unique energy needs, decision-making processes, challenges, and opportunities for each business segment.

Uplight’s primary research program aims to drive a deeper understanding of energy decision-makers. In this study, we used focus groups and a survey to uncover insights into the MUSH sector, consisting of Municipalities, Universities, Schools, and Hospitals, which provide critical public services and infrastructure. This sector is one of the more complex and varied sectors with multiple layers of stakeholders and influence; and, energy decision-making research in this sector is rare.

We found that MUSH energy managers tend to sit in the middle of a wide variety of stakeholders, and use their influence to get their initiatives approved. Cost and timing stood out as the biggest factors in decision-making, and not surprisingly, these organizations prioritized cost savings when making energy-related decisions with air quality and sustainability coming in second.

It's challenging for energy managers to build persuasive business cases, especially when they have incomplete data. Our research participants said they rarely consulted their utility for advice, and that politics can have a big influence on energy decision-making in municipalities and schools in particular.

The research pointed to a clear need for a trusted energy advisor, a natural fit for utilities, to help them access and use energy data, identify best-fit programs and opportunities, and help them construct strong business cases needed for approval.
About Uplight’s Primary Research Program & Methodology

Uplight’s primary research program consists of an annual residential energy customer survey as well as qualitative focus groups. This year we expanded our research to include research on C&I or “non-residential” customers. Both sets of research aim to understand how the customer-utility experience is evolving, as well as the barriers and opportunities around energy management.

Partnering with the See Change Institute, Uplight interviewed energy experts in the MUSH sector in summer of 2021 and facilitated ten focus groups with 37 participants representing the different MUSH segments. We supplemented these discussions with a short, pre-panel survey that 39 participants completed.

What Did We Want to Understand About MUSH?

To drive actionable insights for energy providers, we focused on uncovering the commonalities and differences among municipalities, universities, schools, and hospitals, the identities of the energy decision makers, and the processes that guide energy management. The research also aimed to better understand what motivates MUSH energy users to consider energy management solutions and the barriers preventing them from taking actions. Most importantly, we wanted to know what utilities could do to help improve engagement and program participation within the MUSH sector.
MUSH Sector Overview

MUSH is made up of 140,000 municipalities, universities and colleges, schools, and hospitals and doctors’ offices, many of which have hundreds or thousands of buildings. These community institutions are usually either government or non-profit operated, but the private MUSH sector is growing. It can be easy to overlook MUSH organizations since they tend to pay their bills on-time and require less attention than other sectors. While MUSH entities can be easy to ignore, Uplight’s research revealed they are looking for help to better manage their energy use within constraints around budget, timing, and approvals.

The MUSH sector is defined by organizations large in size, with constrained capital and maintenance budgets. MUSH organizations tend to be strapped for cash, and are often trying to catch up on deferred maintenance and other backlogged projects. Energy use is a significant budget line item, marred by waste. For example, energy costs comprise the second biggest operational expense after personnel for schools. The U.S. Department of Energy (DOE) has found that at least 25% of energy consumed in schools is wasted—and that between 5-15% of that wasted energy could be saved with no-cost behavior change measures.

MUSH organizations are frequently approached by predatory technology vendors that don’t always have their best interests in mind, and these institutions have a hard time wading through this information. Additionally, most organizations typically don’t turn to their utility for help making energy-related decisions, except for those with the resources to employ energy managers. Rather, they have cultivated peer networks they source help from, and because they are in the public sector, they are accustomed to sharing their data with these networks and with others.

Schools and municipalities have their own political challenges because energy objectives are often guided by elected officials. A new set of officials who are voted in can undermine progress, which can be demoralizing and disruptive.

Overall, this sector doesn’t have access to enough data to make well-prioritized energy decisions, often having hundreds or thousands of buildings and addresses to consider. In Uplight’s research, participants noted they lack disaggregated and real-time data, data on baseload and peer benchmarks, and assistance in consolidating and understanding bills across buildings and departments.
How Does MUSH Make Decisions?

Energy and sustainability managers have to navigate a complex set of stakeholders—working with people at all levels to advance projects and build a strong business case. Energy or sustainability managers sit in the ‘middle actor’ role, and as such, need to work with all stakeholders from the top down (long-term, major financial investment and strategic decisions), to the bottom-up (education, communication, behavior change). As the most reliable expert, MUSH energy managers spend much of their time leading through influence. Despite being experts in energy, energy managers often lack the business acumen to successfully advance a project. Due to the absence of supporting data and insights, they also struggle to effectively prioritize energy management projects, so it is far too easy to fall back on their prior experience. Because of this, they may pursue the kind of projects that they’re already familiar with or simply replace like-for-like instead of focusing on the projects that most dramatically slash carbon emissions, have the lowest capital cost, or the best and fastest ROI.
MUSH Decision Makers

An energy decision might involve all, or a subset of the following decision makers:

External decision makers can have an oversized influence on energy management activities and planning, especially if they are political actors such as school boards and local politicians, such as mayors.

Facilities department leaders are in charge of buildings and other assets and liaise closely with the CAPEX (finance and capital planning) and OPEX (operations and maintenance, accounts payable and billing, procurement) arms of MUSH organizations.

Within facilities departments sit the operational and maintenance teams that include building managers, who are focused on the upgrade and maintenance of existing building stock, including retro-commissioning, retro-fitting, cleaning, and repairs. Capital asset managers in construction departments oversee the design and construction of new buildings.

Executive leaders are the top-down decision makers within organizations who have to sign off on long-term or large-scale capital investments and manage strategic planning activities. These decision makers include CEOs, Chief Administration Officers, and Chief Finance Officers.
MUSH Decision Makers (cont'd)

Energy, climate, or sustainability managers are usually in a prominent middle-out position, often embedded within the facilities departments. They have different mandates—from greenhouse gas reduction to energy efficiency to cost savings—but there is a lot of overlap in these roles, and they sometimes occur within one person or team. These subject matter experts are responsible for creating and managing relationships among all other stakeholders as well as setting goals and objectives, implementing technical solutions, conducting R&D, accounting for carbon, and coordinating educational initiatives.

Building operators, engineering, technical, construction or custodial staff are the all-important doers, who actively carry out most energy management activities on the ground. Their responsibilities vary from very specific activities such as commissioning building automation systems to the more general upkeep and maintenance of all buildings and equipment. When making decisions, it’s important that these stakeholders are not overlooked.

"Technicians are the key thing. I feel I have quite a bit of autonomy over some of the decisions but it's always done in partnership with our maintenance and operations teams. So they're by far my strongest stakeholder and my biggest partner in all the work and they're the first group I go to.

If we actually get funded, they help along the way, very much being aware that if it's not gonna be maintained or operated efficiently, it's not actually going to get the outcome we desire." —Healthcare Sub-Sector Participant
MUSH Decision Makers (cont'd)

Building occupants also play hugely important roles in terms of driving energy use, but can often be rather ignorant of the energy, cost, and climate implications of their actions. They include administrative staff, teaching and research staff, medical personnel, patients, students and general visitors of facilities. Some are constant building occupants such as paid staff while others are one-off (e.g., museum visitors) or term-limited (e.g., students).

In universities, the academic experts who were mentioned in our study were excited to share their expertise and new technologies with energy or facilities managers. However, this was often met with annoyance on the part of the energy and facilities staff, since academic experts do not always appreciate energy, budget, and timing needs and constraints. While not decision-makers themselves, academic experts could also be important resources and advocates, especially with respect to energy modeling and introducing cutting-edge technologies.
The Biggest Factors in MUSH Decision-Making

Energy management decision-making within the MUSH sector is a lengthy and complex process, demanding buy-in from a large and diverse range of internal and external stakeholders, especially for long-term, larger investments. Sometimes, these discussions are so protracted that potential grants or incentives disappear or technology that was agreed upon becomes obsolete.
Cost and timing are the two factors most important to MUSH decision-making. Cost, of course, is critical for public resources with limited budgets with schools being especially budget constrained. However, energy decision-making in MUSH organizations is slowly starting to include benefits to the wider organization and community ecosystems, and not simply about the costs of energy and the technology and resources needed to run it.

MUSH organizations also tend to have unique constraints around timing. For example, large energy projects can only occur in the summer for schools and universities. Hospitals can’t disrupt patient care, and coordinating the shut-down of patient areas for a project can take months or even years.

Decision-making can entail longer time frames than in other sectors. MUSH organizations are generally large, often siloed organizations where internal processes and communication may be limited or non-existent. Few energy managers know who to talk to, and when to get projects approved that are aligned with other organizational priorities. They often are reliant on guesswork or luck, being at the right place at the right time.

Other barriers to speedy decision-making include conflicting priorities and staff and resource constraints. Also, it is interesting to note that new construction and design is often easier to get approved if it is budgeted for, particularly with respect to low-carbon, high-efficiency investments, rather than laboring to improve old, existing infrastructure or equipment.

In the next chapter of the eBook, we’ll take a look at what the primary motivations for energy management are in the MUSH sector, what the barriers that MUSH decision-makers encounter, and what utilities can do to help energy managers navigate a complex landscape and make a compelling business case.
Motivations to Save and Participate

Cost saving is the primary motivator for all of the MUSH segments, as they are always looking to extend the value of each dollar spent. Respondents frequently mentioned that much of the motivation for efficiency comes from increasing the longevity of existing infrastructure, and recovering and extending the life of old buildings and equipment to make their budgets go further since new construction isn’t always advised or possible. Energy management and especially energy efficiency contributes directly to these goals.

Participants also mentioned environmental, sustainability, and air quality as other top reasons. Most MUSH sub-sectors had at least some examples where ‘net zero emissions’ or ‘carbon neutral’ targets were driving change. Air quality is also important not only for the healthcare segment, but for schools and other segments as it is directly linked to health and safety—a heightened priority as a result of the global coronavirus pandemic.

Municipalities and universities are raising the bar for decarbonization, with ambitious climate goals. Many universities also have clean energy goals, often driven by students and faculty with ambitious targets to become carbon neutral. One research participant’s university had a goal to become carbon neutral by 2025, another had a 33% reduction target by 2023, and another had a 40% reduction target by 2040. Also, schools and universities can turn on-site renewables or infrastructure projects into learning opportunities, and can get these off the ground quicker if the utility supports or co-sponsors the project.
However, some participants indicated that incentives are not drivers of savings, as opposed to legislation that forces them to implement energy measures and projects.

“I don’t find that incentives, or rebates are really making any sort of difference at all in an organization like this. I think it’s mostly the idea of legislation. Once an organization is forced to do something, they will adapt, and they’ll do it. And I really don’t think there’s any other way to do it."

—HEALTHCARE SUB-SECTOR PARTICIPANT

Healthcare is rightly focused on serving their patients, with energy taking a back seat. Hospitals are open 24/7, and must have reliable energy no matter what. While patient care is most frequently a barrier to an energy investment, it can also be an opportunity if an energy saving project can improve patient care.
Why Doesn’t the MUSH Sector Act on Energy Recommendations?

Given the large group of people involved in energy decision-making and management, the lengthy approval processes, and budget, resource, and timing constraints, it can be difficult for MUSH organizations to make progress on their energy goals. Here are the top barriers for the MUSH sector that our research reveals.

Business cases are hard to build

Energy managers and other decision makers often lack either the skills or the data to make the business case for energy management decisions, defaulting to like-to-like replacement or the lowest-cost decision. Many were hired for their technical expertise, but they don’t have the business or negotiation skills needed to influence the needed stakeholders. And most don’t have access to the most up-to-date, comprehensive set of data to build their argument that will be carried up the decision-making chain.

For larger projects with longer payback, not only does finance have to agree, but the board or other governing body needs to approve.

"I make the business case to my boss, he gives it to the administration; our highest-paid salary person here is the superintendent of the school district. Then the superintendent has to make the case to the school board themselves, and they approve it and... use... taxpayer money."

–SCHOOL SUB-SECTOR PARTICIPANT
Research participants indicated that the most successful business cases include other benefits, which can be unique to the MUSH sector. A university participant described how business cases tended to be more encompassing, and include non-monetary value.

"In the public sector, the business cases have to be a lot more holistic. When we’re implementing a project, we have to show how does that fit within our institution’s brand, how does that fit within our curriculum, can we leverage some of these projects instead of hiding them behind drywall and locked doors, to be able to have a hands-on experience for our students, to equip them for the jobs of the future."

- UNIVERSITY SUB-SECTOR PARTICIPANT

Lack of utility trust

While MUSH organizations are eager for information, they typically don’t see their utility as trusted sources of information and therefore don’t seek out information from them or engage them in facilities audits. Rather, many organizations have cultivated relationships amongst themselves in peer networks.

When they seek assistance or guidance from utilities on their priorities like electrification and distributed energy resources (DER), participants in Uplight’s research were told that their ideas “won’t work” or even more disappointingly, “we don’t understand,” sending a message that the utility is unwilling to be a true partner. There can be a big disconnect between what utilities need (grid reliability at lowest cost), and the additional capabilities or attributes that MUSH customers request.
Politics get in the way

Politics often play a role where officials have the final say, but don’t understand the energy space—as in the case of school boards or city councils. Added to this, funding can change year to year based on the political priorities of elected officials.

"We don’t really know one year to the next exactly how much money is going to be available for us. If the government changes, there might be a new perspective on where the money should go. Or you have plans and a new government comes in and everything changes."

—SCHOOL SUB-SECTOR PARTICIPANT

City mayors can also have a big impact on what projects get approved. The following two municipality energy managers have similar roles, but completely different challenges based on their leadership:

"We have a Mayor that is very passionate about climate change. We’ve really taken a lot of time over the last 12 months, the way we’ve approached the climate emergency. So now, when we are outlining the long-term business case, instead of looking at things at five year cycles, we are expanding it to 10 and 15 years."

—MUNICIPALITY SUB-SECTOR PARTICIPANT

"Our Mayor and senior leadership are not interested in climate change, there is no emergency declaration or targets. So I’m just going after the facilities, the high-consuming ones, and I try to find opportunities. We do regular energy audits, and I’d like to free up the money so I’m able to spend it for other asset management and projects. So we keep talking about a fresh Mayor and council again, who might be looking aggressively into climate change and sustainability."

—MUNICIPALITY SUB-SECTOR PARTICIPANT
Red tape leads to nowhere

Many participants mentioned having to jump through red tape and fill out forms for incentives and rebates—only to be notified that they don’t qualify at times.

Time and resource constraints

Time and resource constraints were the most-commonly mentioned barriers. Timing of capital budget cycles was regarded as a huge issue. Getting sign-off for large or long-term projects sometimes took so long that the technology or incentives changed in the meantime. Because of their decision-making timelines, organizations are mostly reactive to issues and timelines, and tight schedules often mean that like is replaced with like as there was no support or capacity to do more research.

"And then the other thing that’s hard for us is and that we always have to navigate are the capital cycles from fiscal year to fiscal year. For us, the two to three months before the end of the fiscal year, everyone’s madly trying to spend all their money. And it’s just really, really challenging because we are a public institution, and so is our utility, so we have the same March 31 fiscal year. So, if they can just try to make sure that they try to sort of front load some of these approval programs, that would really help us."

—UNIVERSITY SUB-SECTOR PARTICIPANT
Budgets can be inflexible, even if the needs of the organization change. 90% of school funding comes from state and local coffers which, unlike the federal government, are bound by their budgets.

Colleges and universities often are constrained to finish projects in the summer when students are not on campus, so aligning approvals and budgets with this time frame can be challenging.

"But also navigating the challenging and sometimes very long approval times of budgets and incentive programs and things like that and just getting all those ducks in a row to make sure that, come summertime when students are off on holidays, that we can have the money ready. Get in there, do our work and then come September when schools have to start back up again that we're finished...without leaving a trace."

—UNIVERSITY SUB-SECTOR PARTICIPANT
Infrastructure upgrades and air systems have been prioritized

Infrastructure upgrades for MUSH organizations, such as steam system upgrades or building new buildings, as well as air system investments due to the COVID-19 pandemic, are top priority—much of which was not budgeted for. These infrastructure projects might not consider energy management or sustainability. One hospital participant commented that, “Some hospital-specific infrastructure funding typically doesn’t prioritise projects that have an energy conservation theme to them, which is a shame.”

New initiatives don’t always come with new budgets. A municipality participant said, “Some of [the HVAC system was] using UV which is super expensive and it’s more recirculation, which means more building automation system areas so we can monitor really clearly indoor air quality and it all costs, yet my budget has stayed the same.”

Because of these constraints, energy and facilities managers try to increase the longevity of existing infrastructure, recovering, and extending the life of old buildings and equipment.

Also, hanging over every energy and building operations department is deferred maintenance. Although deferred maintenance is not brought up a lot in discussion, most if not all MUSH organizations have some level of deferred maintenance that they are waiting to complete. They often know exactly how much that deferred maintenance will cost, and the amounts can be staggeringly high with not enough budget to get it all done.
There is a disconnect between energy use and management

Finally, not only were staff/building occupants usually ignorant of the energy costs or what energy was used for and wasted on, but facilities managers may not be tasked with energy management and are thus not incentivized to save it. A university sub-sector participant spoke about the conflicting priorities between those managing buildings versus energy managers:

"So while our Energy Manager and myself were in charge, and advocating for energy conservation and efficiency opportunities, at the end of the day, the boots on the ground, the engineers and the facilities managers, are there to ensure that the campuses are safe and comfortable. So there's a lot that slips through the cracks, and doesn't maximize efficiency because of that split."

— UNIVERSITY SUB-SECTOR PARTICIPANT
How Can Utilities Help MUSH?

While a suite of challenges and complexity make MUSH challenging to engage, helping these public service organizations can yield tremendous benefits to the organization, the utility, and to the communities the organizations serve. These organizations are searching for an energy management partner that will help them navigate a growing ecosystem of energy solutions. Uplight’s research pointed to seven things utilities can do to better serve and engage municipalities, universities and colleges, schools, and hospitals.

A true, trusted energy advisor

Most importantly, the research participants seek an agnostic, trusted energy advisor, helping them make prioritized decisions, and getting projects and initiatives approved within their organizations. Utilities can help facilitate this by:

• Surfacing accurate, timely, and disaggregated data to help with decision-making.

• Identifying and surfacing programs and rates for which they are best-fit, and providing clear information with respect to qualification criteria up front

• Devoting staff to act as energy advisors to medium-to-large sized C&I, with some level of account management expertise available to organizations that are large enough to be classified as tier-one, key accounts.
Help organizations measure, monitor, and meter with better data

Central to being a trusted energy advisor is providing and helping organizations decipher their data. The foremost need emphasized by MUSH organizations is transparent access to more accurate, granular, real-time data, including sub-metering and disaggregating different buildings and energy usage types. This was important for benchmarking, but also to undertake solid cost-benefit analyses, including needing information and modelling on soft benefits, such as improved productivity, fewer sick days, and improved indoor air quality in addition to carbon emissions reduction data.

Utilities are seen as either very helpful or hindering access to data. Many had issues with regards to data and billing, including consolidating billing and bills across departments. Some used third-party vendors to help perform these tasks for them, which further obscures perception of the utility as a trusted advisor.

Reliability, access and accuracy of data from the utilities is erratic and often uncoordinated, yet the need for sub-aggregated data and consolidated billing for benchmarking would be of high value to research participants. Months of estimated energy use instead of providing timely, online access to actuals was also highlighted as extremely frustrating.

“I'd love to see them make the data a lot more available. I would love to have the interval data available through the website. I know that it's available internally to the utility and it would be fairly easy for them to make it available to everybody else without a lot of changes... It would make energy management a lot easier.”

—HEALTHCARE SUB-SECTOR PARTICIPANT
Surface the best opportunities for organizations

Energy providers can take it a step further, and help energy managers make sense of the best opportunities for energy management by deriving insights from usage and bill patterns. And using these analytics to rank-order energy improvements, replete with explaining the impact these improvements can have on the organization over time.

Showing the ROI and other relevant data can help energy managers more easily build their business case and effectively influence other stakeholders in the organization. As time-of-use and demand-based rates proliferate with the diffusion of advanced metering infrastructure (AMI), analytics that guide customers in evaluation of best-fit tariff structures will be extremely valuable, reducing customer confusion, helping critical community institutions save money, and growing customer satisfaction—not to mention reducing utility cost-to-serve.

Devote staff to partner with MUSH energy managers

Many research participants wished for dedicated staff, either through a consistent key account manager or an energy manager partly funded by the utility. Respondents said that they seek a more hands-on, customer-focused approach in which utilities work to understand their unique business, user experience, and pain points. Everyone agreed that having to rely on the central call centers is not particularly useful due to high staff turnover and unfamiliarity with the sector's specific challenges and business model.

Utilities have most effective outcomes with MUSH when they have embedded or utility-funded energy managers, although respondents acknowledged that this isn’t possible for all organizations.
Understand the individual segments within MUSH and their unique needs

Each segment within MUSH has distinct needs, and this is even more important to consider with respect to ensuring reliability of public services. For example, demand response can be inappropriate for healthcare because of this sub-segment’s inability to reduce load critical to patient care and comfort. Utilities pushing these types of programs to this community—either via customer care or mass-marketing—show their ignorance of the needs of the sector.

Help this sector take advantage of efficiencies when replacing or upgrading equipment

Upgrading new equipment can be a window of opportunity for MUSH organizations to invest in energy efficient or energy generating equipment. It’s important to educate energy managers and other decision makers on alternatives and their benefits in advance of required replacement since they may lean on existing knowledge instead of conducting thorough market research when it comes time to make their decision.

"Whether they get incentives or not, lighting upgrades are absolutely still booming. You would think that everyone would already have LED or fluorescent lighting. But cities are still switching to LED. I’m starting to see things like boilers and air compressors and HVAC upgrades coming along. But it certainly seems that the municipalities are lagging in how much work they’ve done."

-MUNICIPALITY SUB-SECTOR PARTICIPANT

MUSH staff may have insufficient internal expertise to upgrade and/or operate the variety of available technologies, and will focus on optimizing the technology they already know, based on their individual industry backgrounds.
Help them save money on consumption so they can fund other projects

Financial savings and payback is still central to the business case and getting approvals. However, obtaining energy savings—which often translates to dollars savings—makes the operational piece easier because there is more flexibility with additional cash flow. This is a new way of thinking about the interaction or linkages between capital dollars and operational dollars through energy.

Helping MUSH sector energy influencers demonstrate that dollars from energy savings can be invested back into the core business by contributing to balancing tight budgets is important. Research participants indicated that this capability opens doors to more complicated energy conversations because budget management pressures rise with energy prices.

Make it easy to participate in recommended programs by eliminating as much red tape as possible

Many MUSH organizations mentioned being frustrated by the process of filling out forms for incentives or rebates, only to later find out they didn’t qualify. This sector simply does not have the time for manual and complicated eligibility checks or enrollment processes.

“When I put business cases forward for projects, I definitely focus on the financial benefit and the payback period, because that’s how I can secure funding. So any operational dollars I can save on consumption means that when you know, something breaks, or we need to buy a pump, we can buy the better pump, because we have a little bit more breathing room in our budget at that point.”

–HOSPITAL SUB-SECTOR PARTICIPANT

“That would be my one recommendation—any incentive program that is being done for a school board should know that we only have a limited amount of resources so it can’t be too burdensome on the amount of paperwork, or anything else like data requirements.”

–SCHOOL SUB-SECTOR PARTICIPANT
Conclusion

While constrained by budget, time, and other resources, municipalities, universities, schools, and hospitals represent big opportunities for utilities as well as central to our lives as important community institutions. Uplight's research found that energy decision-making is complex and layered, with energy managers frequently playing the role as a middle actor. And while they are experts in energy, the hierarchy and lack of data can make it difficult to get energy projects approved. MUSH managers are seeking an agnostic, energy advisor to help them make sense of the data and vendor noise as well as make the business case in an often politicized environment. Not only does this enable savings for the organization and progress towards decarbonization, but it also benefits the greater community that the organizations serve.
About Uplight

Uplight is the technology partner for energy providers and the clean energy ecosystem. Uplight's software solutions connect energy customers to the decarbonization goals of power providers while helping customers save energy and lower costs, creating a more sustainable future for all. Using the industry's only comprehensive customer-centric technology suite and critical energy expertise across disciplines, Uplight is streamlining the complex transition to the clean energy ecosystem for more than 80 electric and gas utilities around the world. By empowering energy providers to achieve critical outcomes through data-driven customer experiences, delivering control at the grid edge, creating new revenue streams and optimizing existing load and assets, Uplight shares a mission with its clients to make energy more sustainable for every community. Uplight is a certified B Corporation.

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