

Adam Guzzo: Hello, and welcome to part two of our three-part webinar series on energy data management. In this webinar series we will introduce you to the Department of Energy's *Energy Data Management Guide*, a web-based resource that provides public sector organizations with a seven-step approach to establish a robust and sustainable energy data management program. The webinar series is organized around the guide's three pillars, and part two, today's webinar is focused on building a solid foundation for your energy data management program. So welcome. Next slide.

My name is Adam Guzzo. I'll be your moderator for today. I've been with the Department of Energy since 2010 advising state's and local governments on strategies to maximize energy and cost savings through energy efficiency and renewable energy technologies, programs, and policies. And then more specifically, I lead projects on energy data management and state and local energy planning and was one of the primary authors of the *Energy Data Management Guide*. I want to introduce you to our speakers from Maryland's Department of General Services and the City of Knoxville, Tennessee shortly. Next slide please.

Before we dive into the agenda for today's webinar, let me explain how we're going to handle polling and Q&A. If you enjoyed us last month for part one of our series or perhaps another Better Building's webinar in the past, you will be familiar with Slido. Slido is an interactive platform where you can enter your questions and provide us with some feedback via polls. We'll do both of those things today. So if you would, please go to [slido.com](https://www.slido.com) either using your mobile device or opening a new window in your internet browser. And then you'll see an opportunity to enter in the code. So you'll #DOE. That's today's event code. D-O-E. If you'd like to ask our panelists any questions, please submit them any time in Slido. You can do that throughout the presentation and then towards the end, we'll be answering your questions. Also want to flag a really cool feature that Slido has where you can actually thumb up and use that thumbs up icon to other questions that have been posed by others in the audience today. That will move those questions to the top of the queue.

So and with the next slide, let's talk about what we're going to cover today. So as I mentioned, I'll introduce you to our *Energy Data Management Guide*, briefly do a demo of its features and functionality. Then you'll hear from Lionel Hill and Robert Hopp from Maryland's Department of General Services, and they'll talk about how Maryland's Central Energy Database supports the state's energy and climate goals and enables a number of important

activities that save time and money across the state. And then they'll also talk about how they engage their utilities to streamline access to data and share some proven practices and lessons learned from those experiences. Next, Brian Blackmon from the City of Knoxville, Tennessee will talk about his experience engaging the city's utility to streamline access to utility data and share his proven practices for selecting and utilizing data management tools that support data-driven energy management in Knoxville. And then finally, we'll take your questions and close by sharing some additional resources on the topic that you can check out later. All right, next slide.

So we're going to start things off with a few polls. So hopefully you've had a chance to jump into Slido, and you should now be seeing an option to tell us more about where you work, what best describes your organization. So go ahead and select from the options. You should see state government, local government, K-12 school district, and now you can see that on the slides as well. So it looks like we've got right now a number of local governments in our audience which is great. Brian, hope you're ready to speak to them as I know you are. We got some folks from the state side, some school districts and folks from higher ed it looks like as well. This is great. So it's our first kind of set you up with a couple of easy ones here. Give us a sense of who's in the audience. Again, this particular webinar and the *Data Management Guide* is geared towards local governments, school districts, and state governments and higher ed is often sort of in that category of state governments. So it looks like we've got the right set of folks here for this discussion. Thanks for your feedback.

We can go ahead and move to the next poll and let's talk about what's your role in your organization. So giving you some options here based on those who typically are maybe focused most on data management and energy data management in particular. So data analysts, yep, those are responsible for managing energy and energy related projects. Fantastic. See if we got any engineers in our crowd today. Great. Lot of folks who have the role of energy manager. Perfect. Glad to see some data analysts on the line as well. Let's just scroll down a little bit and see if we've got any others in the other categories today. Okay. Great. So again, thanks for the input. Speakers, I think this gives you a good sense of who is in our audience. Got folks from across the public sector. I know a lot of folks who are responsible for managing energy in their organizations.

All right, one final poll before we dive into the content. This is an

open-ended discussion. So just an open-ended option rather. You can type in the topics you're most interested in learning about today. So we'll try to shape our comments and content as much as we can in real time to some of the things you're most interested in. So go ahead and type some of those things into Slido and you should see that pop up here on our screen. We'll see what folks want to talk about and want to hear about today. You can type in multiple things as well. So as many ideas as you've got. We'd love to hear them.

Well, hopefully you're interested in hearing about data management. That's what you're going to hear about for sure. And if there are particular topics – there we go. Yep, benchmarking best practices. Yep, practical examples of how data management supports your work. Best way to share data with nontechnical staff is a great one. That one we're going to actually dig in even more in part three. So I'd encourage you to come back for that part. How to add EMIS or energy management information system to existing building automation system data infrastructure. Yeah, we'll talk about data tools in this section and there's even greater detail about how those tools interact in step five of the guide. So there will be some good things there. Great. This is really helpful. Streamline reporting tools. Analyzing data. Fantastic. Lot of great topics. I think we'll touch on many of those and again, the *Energy Data Management Guide* goes into even greater detail than we'll have time to do today.

All right, let's get back to the slides and I will introduce you to the *Energy Data Management Guide*. Thanks for your input. So the *Energy Data Management Guide*, as I mentioned DOE released this resource about a year ago. It's a web-based how-to guide. It provides public sector organizations with a seven-step approach for establishing an energy data management program. As many of you know, states, local governments and school districts are large energy users and they own and operate a significant number of facilities and other energy using assets. So taking a data-driven approach to managing those assets can help your organizations identify opportunities for improvements and enhance control of your energy budgets and really make informed decisions about which facilities to prioritize, not to mention create opportunities for energy and cost savings.

And then a proven practice is outlined in the *Energy Data Management Guide* along with the case studies, resources, and tools highlighted in each of the seven steps are designed to help states, local governments, and school districts utilize utility and

asset data to manage the buildings and facilities they own and operate more effectively. You can see the seven steps of the guide listed on the right side of the slide and those are organized into the three pillars that you see there: generate buy-in, build a solid foundation, and hardwire energy data management.

The first two steps, again, focus on generating buy-in and we talked about that in part one of our webinar series. So speakers from the City of Boston and Portland Public Schools talked about how they generated buy-in for data-driven energy management in their organization. So encourage you to check out the recording of that on the Better Building Solution Center if you weren't able to join us. Today we're going to focus on this second pillar, build a solid foundation and steps three through five of the guide. And then in December, on December 2, we will examine steps six and seven which talk about how to hardwire data-driven energy management to your organization. That's where we will get into kind of communicating with key stakeholders that one of you asked about. Next slide.

So as I mentioned, we're focusing on steps three through five. Those are designed to help your organization build a solid foundation for data-driven energy management. In step three, we detail how to create and maintain a central energy database. So by locating and collecting your asset and utility data, developing a standard organizational structure for your central energy database, reconciling and filling data gaps in the database and then establishing protocols to preserve the integrity of that database over time. So that's what step three addresses.

In step four, we describe how to streamline access to your utility data by first assessing your current process for collecting utility data and then investigating options that you can use to streamline that process and then, obviously, implementing those that make the most sense in your current context. And then finally, step five outlines how to leverage data management tools that can support energy data management program. So that includes conducting an assessment, understanding your organization's specific goals, needs, and conditions and then evaluating how the costs, functionalities, and benefits of a variety of tools align with your goals and needs.

So with that, let me transition us over. I'm going to share my screen and do a live demonstration of the *Energy Data Management Guide* and walk you a bit through how that works and functions. So, as I get setup here, just give me a second. So

what you're seeing is the home screen of the *Energy Data Management Guide* and so you should've seen there's a url in the deck which you will have, but you can see it here at the top. You're welcome to go check this out as we do this. So for those of you who joined us last month, some of this will be familiar; but for those who are joining for the first time, we'll just briefly walk through how to navigate the guide and the information that's available in it.

So from the homepage, you can either jump right into the guide by clicking on this Get Started button or using this step-by-step framework here on the right side of the screen. The way the framework was designed is to actually walk you through the process of establishing an energy data management program starting with step one and moving through step seven. However, we intentionally designed the guide as a web-based resource to make it easier for users to jump between steps and topics based on their particular area of interest. And I'll show you that functionality in just a minute.

If you want to learn more about the guide, you can go up here and click on the About icon here at the top or the About word and you can see a little bit more about its purpose, the intended audience, and learn about the methodology that we used when we developed it. So that includes the eight individuals representing 10 states, 25 local governments, and 5 dual school districts we interviewed that informed the content and proven practices highlighted throughout the guide and more specifically, if you want to see who those folks are, got a list of all of those folks and the organizations that they were in at the time we engaged them. So you can see that whole list here.

Take us back here and show you also the glossary. So there's a number of terms throughout the guide that probably many of them are familiar to most of you, but there may be some that are not and so there's the ability to go in here and utilize this glossary to get a definition of some of those terms. So I hope you'll take advantage of that.

I'm going to take us back to the homepage here, and then we'll talk about some of the specific elements of the guide itself. So I'm going to briefly walk through the content in this section, steps three through five. So I could click here and go directly into step three, for example, but I'm actually going to take us to this landing page for Build a Solid Foundation and talk to you a little bit about how this is structured. So what you'll see here now is we've got this

process timeline up at the top shows you where you are in the timeline or in the process for the guide. So here's the landing page for Build a Solid Foundation. It introduces you to the three steps and what they cover.

Then you can actually use this arrow here to see directly without diving into the content, the case studies, resources, and tools available in each step. So for example, if you're a local government and want to check out a case study showing how a city addressed the challenge of managing a large number of utility accounts and assets, you can click on this case study from Fort Worth, Texas, and it tells you how they used ArcGIS software to reduce the number of time sensitive – and time intensive rather site visits required to verify meters and increase the city's operational efficiency. It's pretty brief case study on how they did that process and there are many others like it. Or if you're interested in specific resources, for example, you'll see that we have links to both Maryland and Knoxville's Central Energy Databases so you can check the codes out more and hear about those in a bit as well.

And then same structure for steps four and steps five. You get a list of case studies, a number of resources, and then a number of tools that are either in this case unique to the *Energy Data Management Guide* or in some cases, in the case of step five, take you out to tools and resources from DOE and other organizations that are relevant to that particular step. So this is intended to allow you to get a preview of the resources available and go directly to those if you're most interested in that or you can jump directly into a specific step.

And so now as you can see, we're in step three. Step three is highlighted in the process timeline here at the top, and you're presented with a brief introduction of the content for step three including the four phases to creating a central energy database. So those are listed here and also along the left-hand navigation. That allows you to easily jump to a particular phase in the process in this case that's of greatest interest to you. So for example, let's say you're particularly interested in phase two, creating an organizational structure for your database. You can click on that. You're presented with some summary context for it and then you'll see right up front, we've highlighted a DOE tool called the Standard Energy Efficiency Data Platform or SEED and SEED is a free open source database that allows you to organize query and share building energy data. And so for those that don't already have a central database, I would encourage you to use SEED as a first start in developing that database.

And then I'll just scroll down a little bit through the content here and see. There's different areas where we've broken this content down, provided some tips, provided some tables on how to think about common fields to structure your database, as well as the different kinds of utility and asset data you'll need in order to create what we call a master asset list, complete utility records, and then those built into this central energy database. And then you'll see other tools, case studies, more case studies, examples and tools kind of throughout the content of step three. So that's step three. Very simple.

You want to go to step four, up here at the process timeline, now you're into step four. Very similar way in which the content is presented. You get a summary and then the left hand navigation allows you to see that we've broken step four up into actual five individual kind of sub-steps for streamlining access to utility data. Again, that allows you to jump around based on what your needs are.

And then finally step five, same idea. One thing I want to highlight here is that we've got these interactive hyperlinks for the footnotes. So if you want to see where we gathered the information or the sources for the information, that will actually pop up at the bottom and you can click on a link and it will take you out to the specific resource or tool or website where you can find out more information about that particular area. Let's see. Yeah, and then I'd say in this step in particular, you know, over the years I've heard from a lot of states, local governments, and school districts about the challenge of determining the right tool or suite of tools for managing your energy data.

So step five was really designed to help with that in particular and you can see there's a whole section dedicated to evaluating tools based on their attributes and functions. So we've broken those down for you, provided kind of a categorization of different tool functions including their benefits, energy savings, and the median costs and then going into more detail on each of those function types and provided examples of where states, local governments, and school districts have utilized those tools within their particular organization.

So hopefully that gives you enough flavor of what's available in the guide to whet your appetite and you'll dig in more on your own time and let us know if you have questions or comments. I encourage you to come back next month where we'll talk about

steps six and seven. So you can go ahead and take us back to the presentation please, and we'll turn to Slido for a couple more quick polls before I hand it over to Maryland to talk about their work. So thanks very much. All right, so we're going to talk a little bit quickly here or gather some intel on you on what are the barriers to collecting asset and utility data in your organization. So you can select multiple options here. We understand sometimes there are multiple barriers that create challenges. So we'll try to address these in our presentation as best we can.

So difficulty managing large number of utility accounts and assets, yep, we hear that one a lot. There's a number of resources in the guide to address that. I mentioned one of our case studies from Fort Worth in particular. Let's see. If others want to go in and, yep, weigh in, that would be great. Disparate management in energy, yep, across the organization. So a lot of different agencies may be involved. They own and operate different parts of the overall state or local government portfolio. Inefficient method and format of data delivered by your utility, yep, you're in the right place. Both of these, all of our speakers rather, are going to be able to speak to that and the challenge there. That's certainly one we hear a lot. Data are inaccurate, incomplete, or delayed, yep, that's a challenge. The SEED tool is one that can help support and address that in a more streamlined way. Great.

All right, let's do the next one which is our what are the barriers to performing data analysis and monitoring performance in your organization? So where you get a similar set of options here. Tell us about some of the things that you're experiencing in terms of challenges and we'll see if we can't address those as part of our comments over the next half or more of the webinar. So perhaps you've maybe got less experience with performing data analysis. Maybe you don't have the right software platforms and data tools to help support that. Yep, maybe the process is a bit cumbersome and so it slows down the ability to be actually get to the analysis part of it which is so important. And I'll just say, if there are things that we don't have captured here, that we encourage you to use Slido to explain what those barriers are because we'd love to make sure that we understand those so we can point you to resources or look at maybe where we don't have resources that we need to consider developing to address some of these challenges. Yeah, so the cumbersome data collection process is one rising to the top here. Great.

Okay. Let's go back to the slides and I'm going to introduce our presenters today. So our first speaker today is Lionel Hill from

Maryland's Department of General Services, and then he will be followed by his colleague Robert Hopp, and then we will hear from Brian Blackmon from the City of Knoxville. So on this next slide, I'll turn it – before I turn it over to Lionel, I'm just going to briefly introduce both him and Robert to you. So Lionel presently oversees procurement strategies and account management activities related to deregulated energy commodities and services for all Maryland state agencies. In this role he also executes executive oversight of the state's Comprehensive Utility Records Management Services Contract for the database, and he also managed energy efficiency projects or has managed energy efficiency projects at the state for the last 24 years.

And then Robert currently manages the State of Maryland's energy data program by overseeing the state's Comprehensive Utility Records Management Services Contract, serving as the main point of contact for state agencies in matters related to energy data and ensuring the State Energy Database is as accurate and complete as possible. He also leads Maryland's statewide energy data reporting initiatives to comply with the governor's executive order which aims to reduce energy consumption in state-owned buildings over a ten-year period compared fiscal year 2018 baseline. So with that, I will turn it over to Lionel. Lionel, the floor is yours. Please take it away.

Lionel Hill:

All right, thank you, Adam. I'll give just a very brief history of Maryland's utility database and then I will turn the floor over to my colleague Robert Hopp who will provide some additional detail on the structure and content of the database. In 2006, faced with the need to manage a growing portfolio of energy performance contracts of which Maryland is one of the leading states in implementing and also to effectively purchase deregulated energy, which at the time was relatively new but was becoming a fast growing need, and also to track the progress towards state agency energy savings goals, under which we were – state agencies were required at the time through legislation to reduce energy use by a certain amount over a period of years.

The secretary of the Department of General Services at the time then directed the establishment of a Comprehensive Utility Database. Two years later, the first database services contract was awarded following a comprehensive solicitation process. Presently the database houses more than 1.5 million utility records covering more than 15,000 accounts. I will also add that through the database we are able to track energy use in approximately 100 million square feet of state-owned space. And that also covers

approximately 58 different agencies within the State of Maryland. So at this point I will turn it over to Robert who will provide some more detail on the content of the database.

Robert Hopp:

Thanks, Lionel. So as Lionel said, with the establishment of the database, this slide here kind of gives an overview of all the different programs within our agency that rely on the database really. As Lionel said, it started off with the purchase of deregulated energy and the monitoring of our energy performance contracts but has really expanded to various programs within our agency including our executive order which was touched on a little bit earlier where we are monitoring our state-owned buildings over a ten-year period using a fiscal year 2018 baseline and the goal is to reduce the energy consumption in those buildings by 10 percent. So the goals of that and the data that informs that executive order and the report all come from our State Energy Database.

We also rely on a third party contractor, Bithenergy, to help us with the management of the utility records and they also interact with a lot of our local utilities. I think there was some talk earlier about difficulty with working with state or local utilities. We have a pretty good relationship with ours using voluntary electronic data that they submit to us that's then managed by that third party contractor. And that's a very important piece of this process so that we're not having to rely on our agencies to a large extent for submitting utility bills so that relationship with the local utilities is very important. With sustainability goals increasing thinking throughout local governments, our State Energy Database informs a lot of the renewable energy purchases and greenhouse gas reporting that we need to do. So this slide is just to represent all the things that we'd rely on the State Energy Database for. Next slide please.

So this is just a quick snapshot of our public access database. We have a public access database that is available for everyone to review. We use EnergyCAP as our platform, and there's a slide later about how to access this public database, but you can just see that based on the utility records that get entered into the database. We have some high level dashboards that show our total costs, our total energy use. There's all different things that can be shown through this platform. Our structure, this tree on the left-hand side is what we call it, is a breakdown, you know a parent/child relationship between the high level agency and the buildings and campuses underneath of it and the meters that serve each of those buildings and campuses. Next slide please.

And then this is just a higher level or I guess a lower level breakdown of our Multi-Service Centers at DGS. But really this information can be shown for any meter or building or agency, and then there's all different types of reports that we can pull to find the energy use over a fiscal year or, I don't know, our water and sewer over a certain time period, cost savings that have happened over a certain amount of time. So there's a lot to explore with our Energy Database. We use it for a lot of different things. This is just kind of like a snapshot. If anyone is interested in learning more about our database specifically, feel free to reach out to me.

Next slide is the link to our public access database or if you just search on any of your search engines Maryland State Energy Database, the first link should bring you right to it. So that's it for me.

Adam Guzzo: Thank you, fellas. Appreciate that. Lionel, if you want to join us back on screen before we transition over to Brian, just a few follow-up questions to maybe expand a bit on what you guys talked about. And one of those is, as I have observed over the years, you know, Maryland is a real leader in this space and has been doing this for a while and it's frankly one of the few states I've seen that has a dedicated energy data program manager, the role that you play, Robert. I know you're not the first one in that seat. I think there was maybe two as I understood it from you guys when we talked earlier that have been in that role before you. I'd love for you guys to talk a little bit more about how that role was established and how it supports the mission of DGS. We talked about it a bit at a high level when you showed that first slide, Robert, but maybe a bit more about the essential nature of that role and what you do to help not only manage the database but how that supports the work that you're doing across the state.

Lionel Hill: I'll speak to that, Adam.

Adam Guzzo: Great.

Lionel Hill: Our database went live in January of 2008. At the time there was a person who essentially took on the role of managing the database, but they also had other responsibilities. So the database coordinator position actually kind of grew up organically. So for the first five years or so, those responsibilities were handled by a staff person who also had other demanding – many other demanding tasks to perform. So in 2013 we actually hired our first designated – I'm sorry, not designated, but our first primary database manager who – I mean that was their principal responsibility. And again, the

Maryland program is comprehensive and it's comprehensive on a number of levels. So given the number of accounts that we have, the number of agencies that we have to manage, the number of utilities and energy vendors that we have to manage, this program clearly requires a person with dedicated responsibilities for managing it. So yes, you're correct, Adam. Rob is now the third person to actually occupy that position, but going forward we see this as clearly a position that will only grow in importance and stature. So it definitely warrants a dedicated person with dedicated focus on –

Adam Guzzo:

Got it. Yeah, thanks. I think that's really an important point is just the need for that kind of expertise and capacity to be able to manage that if you really want to do what you guys have set up. And to that end, what advice would you guys offer other organizations, maybe other states looking to establish a Central Energy Database based on your experience?

Lionel Hill:

Again, I will give a few remarks on that. I mean that could be – I mean literally that'd probably be another full webinar topic. But there are a number of things that you should definitely be aware of if you embark upon an initiative like this. First and foremost, you need high level buy-in within your organization. For example, Maryland is a – our utility picture is very decentralized. We have to coordinate with approximately 120 separate accounts payable offices around the State of Maryland, for example. We have multiple vendors that we have to coordinate with. So it can quickly become a fruitless exercise and attempting to herd cats if you don't have someone with the level of authority to decide that, well, first of all, that a database is needed and that all of the parties within your organization must cooperate in providing the level of information on a reliable basis and providing detailed information about their own internal structure of the organization, that type of thing. So you do need high level buy-in.

The other key point I would stress is be comprehensive in your approach. When I say comprehensive, sometimes people think the only utilities that you need to worry about are electricity and natural gas, possibly water and sewer. In our program, in addition to those utilities, we are also monitoring fuel oil. We're monitoring propane, and we also have several district steam and district chilled water accounts in Downtown Baltimore that we manage. So we were set up from the start to manage all of our utility types, not just the ones that people usually think about first. The other thing is we actually track all of our utility costs in an extreme level of detail. So it's not simply overall usage and cost. We're tracking all of our

details across line items. The database that we use, the software that we use, EnergyCAP, is perfectly capable of doing that. And so that's going to be essential. So those are the two main factors. You need high level buy-in; and then when you do move forward, don't skimp on scope. Go full out, be comprehensive, track everything. Of course, remember, you may start the database today thinking that you only need it for a particular purpose today but five years from now, who knows.

Adam Guzzo: That's great. I love that. Don't skimp on scope. That's good. Well, I'll save my third question –

Lionel Hill: We were under some pressure when we set ours up. We were under some pressure to actually compromise on scope, but I resisted that and I mean we're just – every day now we can see the benefit of having not bent to that pressure to just set something up that did a level of summary tracking.

Adam Guzzo: Yeah, that's really helpful, insightful stuff. Thanks, guys. I'll save my further questions for the Q&A with the general audience. Appreciate it. Thanks, guys, for your time. We'll bring you back for the Q&A, and I'll transition now to Brian Blackmon, the City of Knoxville's Office of Sustainability. He's their director, and he's overseen implementation of the city's emissions and energy reduction strategies since 2014. His office manages city-owned public EV charging, energy efficiency and renewable energy projects, operational and community emission benchmarking, and works directly with departments and external stakeholders bringing Knoxville into a lower carbon future. So Brian, thanks for joining us. The virtual floor is yours.

Brian Blackmon: Thanks, Adam. Honored to be here. The Better Buildings team has been fantastic partners and supporters of our work over the years. So glad I can give back. I think go ahead and get to the first slide there. So Office of Sustainability, I see a lot of local government folks in there. Got some friends from Nashville I see in the audience. Chula Vista. Some folks from Massachusetts and Maryland. I'm assuming when the other in the poll about what's your job title was is probably something like sustainability coordinator or professional or director. So happy to have y'all here.

Our office is at the center of our energy data management program, and we've got data going back to 2006. We track somewhere around five million square feet across a hundred facilities and about 427 some odd meters. That includes water and sewer as well. So that could be anything from an open air plaza that's public

space that's metered to rec centers, fire halls, convention centers, and a little bit of everything in between. We manage online data portals. We curate, cleanse data. We do everything for our partners internal and external. Next slide please. Thank you.

So how we started. I'm assuming if you're here and you're interested in foundations, you're either in the fits and starts that everyone starts in or you haven't started at all. So we're in the same boat. I don't think that our story is unique from talking to my partners in other communities and my peers. We started a lot of the same ways. We started with paper back in the day and trying to wrangle how many bills we could get our hands on, pdfs, and then the godsend of spreadsheets. That was probably the biggest change, being able to get digital access consistently across our utility partners to be able to start to manipulate it and streamline things a little bit, kind of the nuts of bolts. If this sounds familiar, just know you're in good company.

When I came into the team in 2014, the first thing that I did was start talking to other departments. Do you have a need? What do you handle? It could be a parks and rec department that's doing invoicing for a shared or leased space, like a Boys & Girls Club or a youth group that's using part of it and they pay the utilities. What are your needs? What are you looking for? What's the format that you're looking at? And in talking to people that had done it in the past, finance teams, other energy professionals, facility managers, and find out what really suited it, the one thing that I learned is typically it was probably biannual, annual at most. And I'm sure some of you can relate to this, you do that biannual and you do the annual sort of update. For about 10 to 12 weeks, if you've got a lot of meters that you're looking at, you or maybe somebody that works for you is pulling their hair out trying to hit deadlines and deal with all the data gaps and all the headaches of trying to get the data in order. And so those were kind of the information that I collected.

As we go into the next slide, I want to preface that I'm a process junkie. I think it's okay to start messy, but you have to constantly be going back iteratively to think about small improvements. Small improvements over time is really the key to success in whatever you do, in my opinion. So my first wave refinements were what are my puzzle pieces? Like what are all the like customer feedback, internal, external, what do we need it for, emissions inventories, budget reviews, tracking renovation project impacts? Whatever that may be that you're thinking about. Invoicing for community partners. Take all those and get them on the table. Take a step back,

that way you can get the full picture.

And then the next step for me was taking all those needs and figuring out what potential resources that I had. If you're like me, I had zero dollars to be able to spend on it. I had the data, you know. I could get spreadsheets at that point from our utility after a little bit of dialogue. Talked to our key utility rep about what are some improvements or small tweaks that we might be able to make so that we can minimize potential fact figuring or copy/pasting issues. You know, how could we make it a little bit more directed to what we need?

And then kind of come up with a cadence that makes sense so that you don't spend 10 to 12 weeks just pulling your hair out. What can you do that's small bites, can streamline it? So simplify and streamline are two critical steps that I started on the frontend. I think it's important to do that and identify those sorts of improvements on the frontend because when you're in the middle of it and you're starting to feel the crunch of wanting to get to the end, it's too late. You're going to have to just grit your teeth and bear it, get through whatever report and then revisit it. So if you've got the breathing room to be able to think through those things right now, now's the time to sketch everything out.

We started with low/no cost solutions. So Portfolio Manager, obviously great tool. Things like SEED provide invaluable stop gaps to get your data and minimize the amount of touches that you have to do or an intern has to do on it. But since we didn't have funds, we looked at a couple of free solutions. But my first step was actually starting an internal access database. So that bottom right picture that you're looking at, that's the actual snapshot that I took about a week and a half ago of our current relational database that we just made in-house, \$150.00 license for Microsoft Access. If you can work in a spreadsheet, you can do the wizard guide, you know the guided process for Access to set your own up. You can kind of grow into it or you can go to a local university and find some students that are very qualified, probably overqualified to do something as simple as a relational database and make something like that for you.

My mantra for first wave improvements is how much can I automate, how many steps can I remove from the data curation and cleansing portion, and then how can I make this as simple as possible. My goal is it should be easy enough for a layperson to be able to sit down and put together. So actually in the top right of that slide what you're seeing is excerpts from a step-by-step guide

that we made over years. You don't have to do that on the frontend, but we've done it over years about how to get the data ready, things to be on the lookout. It's a soup-to-nuts in-house guide that's tailored specifically to our processes that I've even taken high school like juniors, high school seniors and handed that to them and they can handle all the uploads and they can do it with minimal supervision and we don't have to worry about errors.

You're not going to get there at the beginning, but those are the sorts of things when you're coming at it with fresh eyes, you've got a really critical mind and thinking about how you can improve those processes. As much as I hope I save you bumps and bruises, I don't want to paint a picture that doesn't involve you getting bumps and bruises as you develop these programs. Those are inevitable. I hope I can help share some things that'll speed those up or minimize them. Next slide. Great. Thanks.

Second wave refinements. You've got money. You're ready to get a tool. If you've got the money, I think Lionel had a great point, don't skimp on scope. A lot of times you go out to bid and there's, you know, there's a cost to everything but there's always a setup cost baked in to whatever platform you're procuring. Ask them to come up with cost on upload templates. Ask them what they can do with the direct data from your utility to remove that sort of gap of you having to touch it. Those are huge time savers. It's usually not a problem. It's usually a marginal cost. A lot of times they can fit that in because they're used to doing that for their clients. But if you don't ask, you may not get that service.

And the second thing that I would emphasize as you get to that stage is make sure that you negotiate contract language about ownership of data. What you don't want to do is you get into a tool, you outgrow it, it's the best thing that you could afford, and you need to migrate to another platform but you can't get your data out. Make sure you reserve the right to be able to pull the data in a format that's useful to you if you're not tracking it locally. So with that, I'll stop and we can get to Q&A.

Adam Guzzo:

Thanks, Brian, really appreciate that. Such great insights. I appreciate the plug for SEED. I wish SEED was available back in the day when you guys originally got set up because you talked about your Access database and for folks that are at that starting point, I think SEED is really that tool. So I would encourage you to check it out. There was a question about it in the Q&A, and I provided some information of where you go to learn more. Some of its functionality, including its ability to import data from other

tools like Portfolio Manager like Brian mentioned and export it to other tools such as Portfolio Manager as well. So it's really meant to be this kind of central repository that we're talking about today.

Brian, I want to get on – I will pose one question to you and then we'll go to the Q&A from the audience. And just as a reminder for our audience, we'd encourage you to go into Slido and input your questions. I've got quite a few I could ask these guys but would love to take the specific ones that you want to address. So before we turn to the audience Q&A, Brian, you talked a little bit about engaging your utility and the importance of streamlining that access to data. I'd like for you to expand on that a little bit and talk about what are some of the lessons you've learned? How did you start that process, do you think? So saying like, you know, paper, it's great to have something but obviously it takes a long time, it's not easy to manipulate to being able to get data in a different format that allowed you guys to eliminate some of those steps and get to the analysis part quicker and not spend so much time collecting data.

Brian Blackmon:

Yeah, and that's a great question. I think whenever you engage your utility, some critical things to think about. One, some of my lessons learned, some bumps and bruises have been ironed completely smooth since 2014. You know, a lot of people have access to spreadsheets and exports. A key consideration when thinking about engaging your utility, a lot of time if you have a request for, you know, we've got 27 different utility accounts across our portfolio, in that could have hundreds of meters obviously, depending on what it is. They're typically having to run a custom report.

If you've got a key accounts rep, the number one thing to do with that key accounts rep, call them up, have a conversation, have an idea about what sort of tweaks that you might be able to make and say, "Hey, is there a way?" You might want multiline item utility data. You might want a customer charge separated from utility charge separated from demand charge. You might be in a spot where that doesn't really matter to you or some amalgamation between them. Have that conversation about what they can tweak in their report system because oftentimes that is a custom report for customers so they have that ability to tweak typically. So engaging them early, giving them a lot of detail and let them know like, hey, this is something that would make my life a lot easier if we could just make these small tweaks. And usually it's not that big of an issue.

Adam Guzzo: That's great. I'll just put a plug in. There's a case study within the *Energy Data Management Guide* on how Brian and his team engaged their utility and the process they went through to streamline the kind of data they were getting and the access to it. So thanks for that feedback. Lionel and Robert, if you guys could join us back on the screen now, we'll do a couple of questions to the group before we wrap up. I'll start with you, Robert and Lionel, and then same question, Brian, to you as well but getting to this idea of like data management tools. There's a lot out there. How do you assess and sort of determine which ones are the best or best meet your needs? As you guys were considering, Lionel, you probably had the most history but Robert maybe worked most closely with it, with the kind of tools that you were looking at, you ultimately selected EnergyCAP for your database. What features or functionality are most important to Maryland in thinking about your data management tool and your Central Energy Database?

Lionel Hill: Again, when we first solicited for the database management contract, we were, to a certain extent, flying blind. I mean I guess we didn't know what we didn't know to a great extent. We actually ended up with three firms that actually bid on our contract. Two of them had proprietary software. Now, we required all of them to do a live demonstration as part of the selection process. We settled on the EnergyCAP solution primarily because (a) it was third party so, you know, there were no proprietary issues there. And it just, at the time, it seemed very flexible and we wanted something that would allow us to actually grow and do different things in the future as new needs became apparent. So that's really how we decided on it.

Now, quite honestly there are other products out there that are very good. I won't name names, but if you were to competitively solicit today for such services, you'd find there were a number of competitive products out there. But you want something that is (a) is not proprietary. I think Brian made an excellent point. You want to make sure that you own your data so that when that contract expires, if you end up going with another vendor, you get to keep all of your data. So that's also very important so.

Adam Guzzo: Yeah. Thanks, Lionel. Robert, anything you want to add to that? Can EnergyCAP handle real-time data? That's a question that just game though.

Robert Hopp: Yes, it can.

Adam Guzzo: Is that something you guys utilize or do you primarily look at data on a monthly basis?

Robert Hopp: We probably only look at on a monthly basis, but we are exploring some metering options that will eventually be real-time I think on a 15-minute interval.

Adam Guzzo: Gotcha.

Lionel Hill: We're about to go live with a submetering project at our – actually, it's at the state capitol, the state capitol complex. There are approximately 20 buildings that are served out of a central plant there. So we are in the process right now of installing the metering to – and we're going to be metering steam chilled water, hot water, electricity, water, the works. That information, I mean all that data, the plan is to have all of that data regularly uploaded into our EnergyCAP database.

Adam Guzzo: That's great.

Lionel Hill: So if we have a similar webinar next summer or a year from now, I think we'll be able to give you some very good news as to the benefits of having that type of real-time information.

Adam Guzzo: Yeah, great. Might give Brian a chance here to weigh in. Thoughts, Brian on – you know, just quickly and obviously this could go a long time, but a minute, what things were important for you guys as you evaluated different tools and features? I know you use a different platform so that's helpful, too.

Brian Blackmon: Yeah. We've used about five different platforms.

Adam Guzzo: Yeah.

Brian Blackmon: And we've demoed them. I'm not afraid to test them out, especially if a vendor is willing to let us get in and play with it. I think it depends on who's using it and who you would see engaging with it. We've tried some very technical platforms that can do interval meter data, custom reports, dashboards, things like that; but it just depends on your audience. A key thing for me is meeting my customer needs. So if I've got someone in a parks and rec department, for instance, that's interested in doing these quick visuals, they need to run quick reports, I need it to be user friendly. And so I have to weigh all of the different users that are in it, not just me. Obviously I can spend a lot of time looking at energy data, discussing it and slicing it. So for me, it's balancing my ability to save time and run really quick reports with a very user friendly interface. So sometimes you usually have to sacrifice some of the

nuts and bolts of a little bit more interval data, technical sort of aspects to a platform to strike that balance.

Adam Guzzo:

That's a great point. We talk in the guide a bit about – not a bit, quite a bit about who are those key internal stakeholders that you need to interview and understand their needs when you're thinking about not only your central energy database but the platforms you use to manage your data. So it's a great point. Well, guys, that's all the time we have for questions. I'm going to run through a couple of additional slides here for our audience before we wrap up but thank you for your time and your insights. I'll just go ahead and move us into the slide and just remind folks that we do have a part three of this webinar series coming up on December 2. Hope you'll join us for that. Once these slides are available, you can find links to that as well as the recorded webinar from both this webinar and our previous webinar part one.

We also wanted to include some additional resources for you. We talked about a few of them in our webinar today. I'll just highlight that there's a site called Building Performance Tools that brings together all of the various data tools from DOE including SEED which we talked about, as well as these others that I've highlighted like Building Energy Audit Template. It simplifies the process for collecting and managing audit data. As well as Building Energy Asset Score, another tool I would encourage you to look at that can help you assess a building's efficiency and see the upgrades for reaching performance goals. It's sort of a complementary tool to Portfolio Manager, for example. And then there are a number of other resources here on the screen that I encourage you to check out. Next slide.

We also have a number of upcoming webinars in our Better Buildings Webinar Series. A great lineup of presentations through April. We're going to cover topics such as assessing and reducing embodied carbon, to job training and career awareness strategies for workers in the built environment. So encourage you to join us for those webinars. And you can go to our Solution Center to learn more or register. And then we also have the option to look at on-demand webinars, so things that we've done in the past. You can find all of that, including topics from our past summits can all be found right here. So encourage you to check those things out. There's a whole wealth of information there.

And then finally I'd just like to thank our panelists again. Thanks, guys, for your time today. I appreciate your insights, your feedback. I know this is a topic we could talk about for probably days. So I'd

encourage you to reach out to these guys or myself if you've got additional questions or if you'd like to get any more information about what you heard. And then certainly I'd encourage you to follow the Better Buildings Initiative on both LinkedIn and Twitter. That's where you get your latest news from us and you can see where to do that on the left-hand side of the screen. With that, I'll say thanks very much. We'll share our recording of the slides and the transcript on our Better Buildings Solution Center and that should be available very soon. So have a great Thursday, everyone. Take care. Thanks for joining us. Hope you found this valuable. Look forward to talking to you next month for part three. Take care.

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