

Alice: Hello, this is Alice Dasek with the U.S. Department of Energy's Better Buildings Initiative. I'd like to welcome you to session one of the Better Buildings ESPC Webinar series.

It is a five-part series exploring the tools and resources of DOE's energy, savings, performance, contracting toolkit. Today's session will take a look at the resources available to help project owners decide whether ESPC is suited for their retrofit.

In this hour I will start off the discussion by talking about ESPC and what makes it useful to consider in the MUSH Market. That means in municipalities, universities, schools and hospitals. Joining me is Elizabeth Stuart of Lawrence Berkeley National Laboratory, who will share data and statistics from her research on energy savings performance contracting that demonstrate current practices in ESPC projects, as well as the potential that still exists.

I will finish up with a look at how the resources in the ESPC toolkit can help you consider whether ESPC is a possible avenue for your planned retrofits. Before we get started on our program, please note that we will hold questions until after the presentation.

Please send in questions through the chat box on your webinar screen throughout the session today, and we'll try to fit in as many as we can. This session will be archived and posted to the web for your reference.

To help us tailor our slides to those most useful for you, we have a couple of poll questions to start us off. When the poll question comes up on your screen, please select the one sector that most closely fits yours.

[Background conversations.]

Alice: And we're waiting for the poll results. Okay, thank you for those results. So our follow-up poll question is not necessary. We see that almost half of you are from ESCOs or other private sector businesses, and so I will just note that I've included several introductory slides about ESPC and how it works, but in the interest of time today and given the audience, I will let you review those slides or share them with others at your convenience after the call.

I want to make sure to get through all the material that we've prepared for you today. So I will advance the presentation to the beginning of the next section which explains the ESPC

opportunities for the MUSH market.

ESPC offers several benefits listed on this slide that are worth calling out. ESPC provides up-front project costs to let the project get started right away and avoid the cost of taking no action.

Project savings are guaranteed for peace of mind, and an added benefit, the money that was going to cover bills can instead be used to accomplish mission-oriented goals and I'll just quickly put up this nice quote that we got from a school system for a report we published a couple of years ago.

The point here is that the ESCO takes on project risk, and the project owner gets peace of mind, and the project owner can then use the funds that would have been going to pay energy bill, and use them for their mission.

Now we'll talk specifically about how ESPC can support a variety of MUSH sectors in their missions. The MUSH sector faces challenges in its facilities. In the face of tightening budgets, the public sector has had to still figure out how to accomplish the maintenance needed on their buildings and cover non-energy related needs as well, cover increasing operating costs, that is rising energy costs, and improve the indoor environment.

Let's look at each of those areas in a little more detail. They really demonstrate the great opportunities available in the MUSH sector through doing ESPC.

In the category of building maintenance, public buildings face an acute need. Our research showed that public buildings are some of the oldest in the country and the American Society of Civil Engineers consistently gives public infrastructure a grade of D plus.

So there is a lot of deferred maintenance in this sector. The good news is that ESPC projects can incorporate these maintenance measures, and in fact research by one of DOE's research laboratories, Lawrence Berkeley National Labs, LBNL, showed that two out of every five K through 12 schools pursuing ESPC folded in non-energy measures like roof replacement or parking lot repairs.

As energy costs continue to go up, public facilities spend more of their budgets on operating costs. In the first decade of this century, energy costs went up by about 80 percent and are expected to

continue rising for another couple of decades.

As of late last year, state and local governments already were spending close to \$315 billion per year just on energy. Thus, ESPC represents an opportunity by reducing utility bills for public facilities, and improvements of equipment and building envelope can reduce ongoing building operating costs.

In fact, all ESPC projects active in the year 2012 reduced total U.S. commercial building energy consumption by about one percent, or 224 million BTU, and finally an ever-present concern for public buildings is the quality of the in-door environment.

Studies have shown the detrimental impacts of poor indoor air quality, uncomfortable air temperatures and inadequate lighting. Here too, ESPC can support efforts to maintain or even improve a healthy indoor environment by upgrading ventilation, HVAC and lighting systems, just to name a few. The results have been positive, as you see in the statistics captured on the bottom part of the slide, both in productivity and in health.

Now let's look at how ESPC has actually performed and the potential it has to do more with a look at the broader ESPC market activity with Elizabeth Stuart of Lawrence Berkeley National Laboratory. Turning over to you, Liz.

Liz:

Thank you, Alice. Hi everyone, so I'm going to give you an overview of what's happening across the country in the world of ESPC with a focus on the MUSH market. So we'll go to the next slide, and as Alice pointed out, you know it's really kind of a perfect storm.

There's a lot of sensible motivation and potential for ESPC to provide value in the MUSH market. She talked about the tight budgets for energy efficiency and other cost-saving improvements that ESPC can provide.

So Lawrence Berkeley National Lab conducts a lot of research on the ESCO industry. We have databases, we do market and project analysis, and we've learned that the ESCO industry in general and ESPC delivers a lot of energy savings.

So we analyze projects that were active in 2012 and learned that those projects save \$224 million in MBTU in 2012, and that was approximately one percent of total U.S. commercial building energy consumption.

So we also kind of analyze projects in a large database of ESCO projects and we find that a typical MUSH ESPC project saves from about 13 percent to 33 percent annually over the baseline energy consumption.

And then if we're thinking about well, how much is left to do, we also did a market analysis to look at remaining market potential.

So we've learned that in – if we look at the market in 2014 based on our market surveys, the ESCO industry was at about \$5.3 billion in terms of the investment that customers made, and the industry expected to grow 13 percent annually, and that would end up at about \$7.6 billion in 2017.

Hopefully we'll get to do another market report and find out what the growth potential is after that. So we did learn that there's a significant market potential remaining, and we estimate that in the MUSH market the remaining ESPC project investment is anywhere in the neighborhood of about 51 to about \$86 billion.

Next slide, please. So information on this slide and the next slide comes from the LBNL Triennial ESCO market survey and report, and so right here, we look at sort of the percentage of ESCO market activity by sector and we can see that actually 70 percent of ESCO market activity comes from the MUSH sector.

We've got the purple, state and local; blue, light-blue K thru 12; dark blue, university, college, and the yellow, healthcare. So you know ESCO's primarily serve public and institutional sectors. They understand the rules and the regulations, and how to work with those customers. Next slide, please.

And further we know that in the ESCO world, most of the market activity is ESPC. So ESCO customers primarily choose ESPC as a vehicle for getting these projects done, and we can see that over time, ESPC has remained nearly three-quarters of the work that ESCO's do, and in fact between 2011 and 2014, the industry, the percentage of the industry revenue even increased in terms of use of ESPC. That's the purple layer, you can probably see that.

Next slide, please. So this information, and it's a lot to look at, so I'll explain a bit about it. This comes from the database of over 6,500 projects that Lawrence Berkeley National Lab and NAESCO, the National Association of Energy Service Companies have coordinated and developed over more than the past 10 years.

These projects have largely been provided by ESCO's who have been submitting their projects for accreditation with NAESCO, and some of the projects also come from state projects.

So this chart is showing various kinds of the more common energy efficiency or other kinds of measures. On the left side, you can see lighting and control, and commissioning, and then the color bars show – the length of the color bars show the percent of the projects that are in the database that contain these measures.

So these are not mutually exclusive but we can see that basically looking at lighting and if we look at the blue bar, which is the MUSH market, we can see that over 60 percent of the projects in the database that are in the MUSH sector included lighting.

They've probably included a lot of other measures as well. So we can also see that the next one down, energy management systems, a lot of projects include those, and then further down the list, a smaller percentage of projects included these other measures but we can see that the MUSH market controls and motion sensors, we can see still relatively large number of projects or percent of projects contain motion centers, drives, commissioning.

So MUSH markets really, the mush market projects really implement a wide range of measures: facility improvement, energy saving, water saving, as well, water conservation and other kinds of building improvements.

So let's go to the next slide. So sorry for all the words here, but I will talk about we calculated a remaining market potential and we looked at sort of what's the floor area that is addressable by ESCO's in buildings typically addressed by ESCOs and we estimated that the unaddressed MUSH floor area, this is a part, a few years ago was over eight billion square feet, and so based on typical savings of MUSH projects, we estimated that this represents about 200 to 260 trillion BTU in energy savings that might be able to be captured.

So we approached this potential by first developing estimates of MUSH market floor area for buildings typically addressed by ESCO's and we used various databases such as the commercial building energy consumption survey, and other government data sources.

And then we also kind of triangulated with well, what are the

building sizes that ESCO's typically addressed, and included in this estimate are only buildings that are over 50,000 square feet.

So it's actually could be a conservative estimate in that we know that ESCO's do address smaller buildings, if they're sort of bundled in a campus, say, something like that, and then we also, you know our methodology, we interviewed numerous ESCO executives and industry experts to get their take on the percent of floor areas they think have been addressed by ESPC in the market sectors they serve.

So we got a lot of input and kind of a crowd-sourcing approach and we found that the opinions and expertise really didn't vary all that much, in terms of what folks thought was basically the penetration percentage in each market, and we took those median estimates to determine the remaining unaddressed area.

And then we generated, so the remaining investment amount and savings per square foot that remain, and you can see that in the LBNL 2013 market report.

Let's dive a little bit deeper into some of the MUSH subsectors. Next slide, please. So the next three slides actually take information from this LBNL-NAESCO database but these statistics are actually produced by a benchmarking tool that is an e-project builder and you can access the benchmarking tool, even if you don't have an account in a project builder, you can just go to the website and use the tool.

So, one, there are a lot of different statistics we can get out of that tool but for this presentation I've focused on just a one key one. So we looked at, first of all we, based on our market potential we find that about 70 percent of this, of all of the state and local buildings floor area had not been addressed by ESPC when we surveyed all the experts, and we estimate that that remaining potential represents 39 to 55 trillion BTU in energy savings.

And then if we look at some statistics from the database, produced by the e-project builder benchmarking tool, we can see that a typical state and local ESPC project saves 20 to 40 percent annually over baseline energy consumption.

If we looked at the chart here, the little line in the middle of each of these bars represents the median percent of savings relative to baseline. So we can see that if, for some different retrofit strategies, each bar represents a different retrofit strategy. So the

bar on the left is projects that are lighting only.

The second bar from the left are projects that are dominated by large HVAC equipment. The bar in the middle are projects that are more of the mix of measures. The second to the right bar or projects that are dominated by on-site generation, and then the far right are projects that are other, and often those projects include a lot of non-energy benefits and measures.

But we can see that the median hovers over 20 percent, and in fact lighting only, the median goes up to over 40 percent. So we take into account the percentile, you can – there's a good, solid range of savings that are possible.

So let's go to the next slide, and with all of that explanation, I won't have to explain quite so much. So in the K to 12 sector, we find that about 60 percent of K thru 12 school facility floor area has not been addressed.

So K thru 12 has – probably was the market with the highest penetration. A lot of work has been done at K thru 12 schools but you know there's a lot more work left to be done there. So the remaining potential, we estimate represents about 41 to 59 trillion KBTU in savings, and then a typical ESPC in the case 12 sector saves about 13 to 34 percent annually, over baseline consumption, and let's go to the next slide.

So we'll look at the University-College sector, and in that sector it had a lower penetrations estimated by all of the industry experts. So based on that, we estimate that about 70 percent of their floor area has not been addressed by ESPC, and that this potential represents 39 to 55 trillion BTU in savings, and we also find that a typical state and local – oops, sorry *[laughter.]* I'm on the – I'm looking at the wrong slide.

The typical remaining potential, or sorry, typical ESPC project save 13 to 32 percent annually over baseline energy consumption, and again, just to let you know these are – these could be conservative estimates in some regard because we don't consider all of the projects – we don't consider any projects under 50,000 square feet, but it could also be that there are other kinds of barriers that might make some of this floor area inaccessible for projects, and it could be market barriers or institutional barriers, you know for example in the school district, there just might be schools that aren't doing ESPC for whatever reason.

So this is kind of a technical, roughly a technical potential, and so in terms of actual, achievable potential, the numbers might be different, and that gives you an overview, and we can go to the next slide and thank you very much.

Alice:

Thank you, Liz, and now we'll move on to our next section and the focus of today's discussion: DOE's ESPC toolkit. So seeing the ESPC opportunity as we have heard and seen in the beginning part of this session, several years ago, DOE began offering regular assistance to expand access to ESPC for state and local governments interested in leveraging ESPC.

Three years ago, DOE launched the ESPC accelerator; one of the first of several initiatives like that to enable energy efficiency in specific areas.

So let's take a look at the accelerator. It was a three-year program that ran from January 2014 through the end of 2016. So relatively recently, it concluded. There were 25 partners, including 18 states, six cities, and one school district, and the goal was for DOE to support ESPC investment of two billion dollars.

I'm really pleased to report that partners exceeded even that ambitious goal, recording \$2.1 billion in ESPC investment over that time period.

You can take a look at this slide at your leisure, at the areas of activity that were part of the accelerator but today I'd like to focus on the final area; area three. Each partner elected one barrier to ESPC investment to work on resolving over the accelerator period.

Very often the barriers that they identified were common to those that other state and local governments experience, and so accelerators then adjust the solutions and the resources to be universally applicable, and then make them available to other public organizations that face the same barriers.

The solutions form the basis of what is now known as the ESPC toolkit, and here you see the original home page for the toolkit. DOE combined solutions coming out of the accelerator with other ESPC resources that we already had into one package.

And to make navigation through them as easy as possible, the toolkit is structured along the lines of the ESPC decision-making process that we heard from state and local partners. Thus, you see the categories here of starting with considering ESPC, then

implementing and so on.

And today we're here to specifically focus on the first section, considering ESPC. This section includes resources that help the user understand the general legislative and market conditions for ESPC, the opportunities that ESPC presents, and then further decide whether ESPC is the appropriate vehicle for their specific retrofit.

I'll provide just a one-sentence description of each of the tools listed here for basic information, and then I would like to ask all of you to select which tool you'd like to hear about in more detail today. So the first ESPC or design bid build is an illustrated one-pager that enables users to decide whether ESPC or design bid build is more suited to their planned retrofit project by comparing the development, management and outcomes of each approach.

Next is the preliminary diagnosis tool -- answers to this quick list of two or three questions might help you determine whether ESPC is the right solution for your energy efficiency goals.

Next is our newest addition to this section, the ESPC resource summary and it is a four-page information sheet that summarizes the benefits of ESPC, includes some example projects and compiles a list of ESPC guidance and resources, across the public sector, including Federal agencies.

The LBNL market study, we have Elizabeth Stuart here, who has already provided a glimpse at some of the statistics that are included in that report, and this study provides a comprehensive overview of the market size, growth projections, industry trends, and market potential in the U.S. ESCO industry.

And then finally, the legislation library is an inventory of ESPC legislation across the country. It provides sample successful ESPC legislative language for users interested in taking that language that has been successful elsewhere, and drafting or revamping their own legislation.

So now I would like to open a poll to see which tool you would like to hear more about today. Okay, with the poll closed it looks like the top vote getter is the preliminary diagnosis tool. So at this time I would like to turn the floor.

I have invited Philip Quebe of the Cadmus Group to come on and talk about this particular tool, and actually I can start but Philip

Quebe of the Cadmus Group, who was part of the team during the development of the document where the preliminary diagnosis tool came from can walk us through the details and then answer questions about it later.

So I've put up the background slide for this resource. It actually is an exact replica of what is on the website.

So I don't need to bring up the live website for this and here are just some very preliminary questions for people who are considering ESPC for their project, to look through typically an ESPC is most beneficial when there is at least the 50,000 square feet of floor area as you heard Elizabeth mention earlier, spending on energy bills annually of \$60,000 or more, and then finally there are other conditions at the bottom in terms of comfort complaints, or the age of the equipment, or not enough on-site personnel that would be able to take care of the retrofit that is needed, the deferred maintenance for example.

And then another consideration can also be length of tenure expected to be in that building. For public buildings, we know that that is not usually a condition, so it has not been explicitly included here but certainly as a consideration for folks.

And then we did make an important note at the bottom about local conditions do matter, and so what works in one jurisdiction might not work in another, and so it's always good to check if there are specific requirements or notes in your particular state or region for that.

And so now, Philip, are there additional things that you would add to that?

Philip:

Hey Alice, yeah. Thanks for having me join here. So I just wanted to add this comes from a public issue which is energy savings, performance contracting, guidelines for developing staffing, overseeing a state program, and that's a broader guide that the intent of this piece is just specifically to set up a couple of initial questions that you might ask yourself, to determine whether or not ESPC is a right fit, and if it is, obviously you would go to some of the other tools that we just talked about to dive into that a little deeper.

Alice:

Okay, thank you, Philip and I see we do have a little bit of time left. A close runner-up on the list for votes was the one-pager, and Philip was the primary architect actually of the one-pager,

comparing using energy savings performance contracts for a project, versus what is traditionally used in the sector of design-bid-build, and I wondered, Philip, if you wouldn't mind walking us through the details of that, and I can bring up the – this background slide and I can also bring it up live, if you need it a little bit larger, so that people can take a look.

Philip:

Sure, I'd be happy to. So one of the questions that we hear a lot from organizations that are considering ESPC is you know, ESPC sounds great, ESPC sounds great, but couldn't I just do this myself, and that's a great question.

The answer is obviously that ESPC is a tool in the toolbox, and that no one tool is best fit for every job, so what we did is we put together this one-pager that compares a traditional design build project delivery approach with ESPC to help highlight some of the similarities and differences.

And the document breaks down both of those project delivery options over the five stages in project delivery. So starting with planning and development, all the way through post-acceptance performance, and gives a little bit about how each of those two methods differs.

And then at the bottom, it gives some advantages which hopefully help in understanding when either of those options is best; so advantages for ESPC and then some for the design- bid-build approach.

Alice:

Okay, thank you very much, Philip. Now in the time remaining, I'd like to open the floor to your questions or if you already have been typing them into the chat box on your screen, we will answer them from there.

Jen:

Hey Alice, this is Jen. I can read off a few of the questions that we have. One came in in regard to the MUSH market. There was a slide on installed measures, and so the question is do the most popular measures correlate to the relative cost-effectiveness, complexity, or other characteristics?

Alice:

Yeah, I think Liz, that was probably from one of your slides.

Liz:

Yes, let's see.

Alice:

Do you want me to go there?

Liz: Yes, please. Sorry, repeat the question?

Jen: Yeah, there's a measures install slide and they want to know do the most popular measures correlate to the relative cost effectiveness, complexity, or other characteristics?

Liz: Oh, that's a great question. This slide doesn't indicate that at all. So relative cost-effectiveness has to do obviously with the measured cost and then the savings benefits.

We don't have that information in the NAESCO-ESCO project database on an ECM level, unfortunately. What we do know though, is that in the e-project builder database which is in development, I mean it's released and we're building up a robust database of projects, and ultimately, once we have enough projects in there to get statistically significant results, we will be able to give you information about that level of performance on an ECM basis.

But unfortunately in this large database, because the ESCOs were not required to submit ECM level sort of cost and savings data, we don't have that data, unfortunately.

We do have a report coming out fairly soon that's going to look at some of the cost and savings trends overall in ESCO projects with some projections about sort of what that might mean in terms of various retrofit strategies.

We won't have it to the level of ECM but again, just to recap, ultimately e-project builder will hopefully be able to provide that level of information.

Jen: Great. We have another question here. With budgets becoming tight, even for the commercial sector, is ESPC applicable to the commercial sector, or is it only for public institutions?

Liz: Yeah, great question. So commercial institutions do indeed use ESPC but simply not as frequently. Usually there are other funds available, other budgets that they can tap into to do their projects without taking debt and so in our case, we work primarily with public institutions around ESPC and that's what this is geared toward, but certainly they do use it in the private sector as well.

Jen: Okay, another question. A big part of ESPC is the financial terms. What lessons learned are there that you can share on that side?

Alice: Lessons, learned. That might come from some of the research, Liz. Is there something that you all have pointed out in your market studies or any of your analyses?

Liz: Sorry, would you repeat that question again? I'm trying to – I'm thinking through what we have in our studies that might cover this.

Jen: Yeah, I think the question regarding the financial terms of setting up the ESPC and what lessons can be learned from that.

Liz: I mean I guess we can't really say anything about lessons learned, per se, because our studies really operate on sort of basic data surveys. We do have some information in one of our reports about the kinds of financing approaches used, such as you know, are they using a term lease, are they using bonds, things like that.

So we have some information about general use of those kinds of financing. I don't think we have enough granularity of data to really say anything about lessons learned per se from our analysis.

Again, we might in the future when we have more granular data and if we're able to sort of dig into the financing question in a future survey, because we asked it at a pretty high level before. We might be able to find out more information.

So I think that's actually a really great question in terms of what we should think about in our next survey, you know in terms of lessons learned in that regard, and also you know if we're – if we happen to be able to, really the lessons learned would probably be more from the customer side, the agency side, as opposed to the ESCO side.

So to date, our market surveys have really been from the ESCO perspective, and so if we're able to do some research from the customer perspective, that would be a really important question to look at.

I think Alice and I are gonna be working on some possible future projects in that regard. Alice, do you have anything else to say about that?

Alice: Well, it would depend maybe on some more detail around what lessons learned they're looking for. What comes to my mind is the model ESPC documents and kind of how the terms are established for each contract in the contract itself.

And so that's kind of very important to have set up, up front but that would be a whole different conversation perhaps.

Liz: Right, and also what comes to mind is there is the K thru 12 project guide that's on the Better Buildings site. I think is that even – is that part of the Toolkit, Alice?

Alice: Yes, it is. Yes, it is *[laughter.]*

Liz: Yeah, so I think that that's a really – it probably provides information that could be useful for any MUSH market sector but of course it's targeted just to K thru 12 schools, and it does go into some details about the different kinds of financing approaches that can be taken.

So that might be a great resource to just you know review and look into that a bit. I don't know that it has lessons learned per se, but it certainly has examples of different ways that projects have been financed in that regard. So it's a great tool.

Alice: Yeah, and I would just add also if we're not answering the question with enough detail, or exactly the way the question was intended, I do please invite you to send me a follow-up email with some more explanation of what you're looking for and we can certainly point you in the right direction.

Jen: There's a question on the one-pager where it talks about financing. They want to talk about how does it relate to the statement that there are no up front costs required. There's a concern that people misinterpret that statement, and also how can savings be used for other expenses, since those dollars cover the cost of the debt service.

Alice: So Philip, do you want to start with the one-pager and then I can take us back to the graphic about the debt service?

Philip: Yeah, we're talking about the ESPC versus design-bid-build one-pager?

Alice: Yes.

Philip: Okay, and the question is could it be misconstrued, the statement that there are no up-front costs, that was the first question, and the second question was which – could you repeat it?

- Jen:* Yeah, how can savings be used for other expenses, since those dollars cover the cost of the debt service?
- Philip:* Okay, to first – to the first question, no upfront costs, so it depends on how it's structured and typically the cost you're associated with, the upfront audit in an ESPC would be rolled over or covered as part of the larger ESPC contract, once that's pursued.
- So it might be more accurate perhaps to say no out-of-pocket costs initially, but it does sort of caveat that. It says it's unless ESPC is not pursued. In some cases, if the contract doesn't go forward or the ESPC process isn't completed then there may be costs associated with some of that up-front audit work.
- Two, how does – how can the savings cover other expenses, and that depends on how the contract is structured, and whether you're using 100 percent of the savings to finance ESPC.
- You know, some ESPCs are cash-flow neutral. Some can be positive cash flow. It depends on how it's structured. Does that help answer the question?
- Alice:* And I've got the graphic, Philip that comes up in many of our reports, if you wanted to reference, that shows cash flow over time.
- Philip:* Yeah, so that's great. Yeah, right there, you can see there in the middle, during the term of financing, again, like I was saying it's if you're not financing, using 100 percent of the savings, there could be some savings put aside to cover other things and the rest will go to paying the debt service.
- Alice:* And of course over the longer period of time, at some point, when the debt service is paid and then it is assumed that that money from that budget would go to savings.
- Philip:* Correct.
- Alice:* That can be used.
- Philip:* Yeah.
- Liz:* Right, and in fact, this is Liz, the report that Lawrence Berkeley National Lab is working on, we've done an updated analysis of the projects in our large database, and I was just reviewing some of the graphics with that, and we do have a slide or a graphic that shows the sort of mean lifetime of the measures, or the kinds of measures

being longer than the contract term.

So this third bar here really comes to fruition on projects where you know, even after the contract is paid off, there are still savings accruing and you know, so depending on the structure of your financial those are – they're obviously reduced operating costs.

It could be operations and maintenance costs or you know, energy or water costs that continue because you replaced some old equipment with something very efficient.

Jen: There's a question about what happens if there is an expansion after the retrofit in the building.

Alice: That's a great question and I know that it does come up and it is often – the outcome often depends on the agreement between the project owner and the ESCO, and up front in the contract it's always a good idea to have contingency plans for just such a condition.

I don't have any specific examples in mind but that is what I have heard. I don't know if Philip, Liz, if you had any specific examples that you've heard of, how it was treated?

Liz: I don't. I mean yeah, we don't have case studies per se on that.

Alice: Yeah – no. I do believe it's all a matter of the upfront agreement.

Liz: Definitely.

Alice: So it can be on a case by case basis.

Liz: Oh yeah, definitely.

Jen: Okay, this is more of a comment I think rather than a question, but it was saying that in their experience, the ESCO process is often more expensive with a high mark-up and may not be well installed, and that without the oversight there are often shortcuts that result. They think that it would be better if low interest loans were available.

Liz: Interesting comment. I mean yeah, every project is individual and you have to decide for yourself, what makes sense. I mean the thing about ESCO projects of course is ESCOs work really hard to serve their customers.

I mean in terms of the NAESCO accreditation process, where the accreditation committee members check up basically on the projects and they talk to customers, and say what was your experience? Did you actually get these savings?

So M&V is a key piece of that when the ESCO comes in and they, since they're on the hook to guarantee the savings, they have to – there's annual M&V done to make sure that those savings are materializing.

So that kind of a guarantee is important. That's kind of a key piece of what ESCOs provide as opposed to other service providers but you know it's your choice. Do you have any other comments on that, Alice?

Alice: I do not. That was well said.

Jen: There's a question about why the majority of ESPC jobs go to control companies when in fact they do not have expertise with HVAC design?

Liz: That's a good question. I know that that's true but I don't know that there's evidence of that. It would be great to know where that comes from but it's really the choice of the customer who they decide to go with. Someone else was gonna jump in. Sorry, go ahead.

Alice: No, that was Alice. I was just going to say that I have not had direct experience with that. So I was not able to answer.

Jen: There's a question here on e-project builder and whether or not it's only for the contiguous United States?

Liz: Right now, it's only for companies and agencies that are – that operate out of the United States. We've got – there are some Federal projects in the e-project builder that are for example in Guam or something, like defense department projects or something.

So that's basically like I said companies and organizations within the U.S. but the projects can certainly be outside the U.S. if that's the case. I hope that helped.

Jen: Another question about whether data on the impact of individual measures were coupled with CBECS and EIA data?

Liz: No, we don't have enough information on individual measures. Again, the individual measure data comes from the large LBNL-NAESCO database, the information we have about measures is what measures were included in the project but we don't know from that data, individually what each measure cost and what each measure was estimated to be saving.

However, we do have a lot of information about sort of the range and median of savings per square foot, savings per dollar invested, things like that by market sector at the project level.

So that's the level at which we can do analysis on the ESCO database of projects and, again, I won't go into too much detail but e-project builder is a newer database that's being populated and used by increasing numbers of states and Federal ESCO folks.

Right now it doesn't have – it has a small percentage of the other database that's been developed over many years. E-project builder has about 500 projects.

So it's – you know it's growing and it's not representative yet but eventually there will be a robust database of projects that include such information as exactly what ECMs were installed and you know we can do the range of costs and savings by ECM type.

But even that will be – still be a challenge because someone can call something a lighting ECM, and in one case maybe it's a lot of lamps and ballasts; in other case it might be some other kind of technology, or they might even include controls under what they're calling a lighting ECM.

So you know we can make some general observations about these kinds of things and but there's some variation obviously in what is included in for example an HVAC ECM between one project and another, but we'll be able to say with a lot more granularity in the future, using data from e-project builder. I hope that helps, that answered your question.

Jen: Okay. It looks like we've got two more questions here. One is what is the best practice to establish baseline costs on which to calculate the savings?

Alice: So I'll start off. I'll say that the best recommendation I have there is to – I can refer you certainly to one of our lab partners that does all the calculations for our Federal projects.

Secondly, of course if you have access to a project facilitator, they often have their own recommendations for best practices. So I'm happy, if you'd like to reach out to me by email, this is Alice Dasek from DOE, I'm happy to make that connection for you unless – and then I will pass it for you, Philip or Liz, if you have any more concrete information right on the phone.

Liz: I mean I can offer that there's a lot of really good guidance, and I don't know Alice, this might be included in the tool kit, in the FEMP M&V 4.0.

Alice: Yes.

Liz: Yeah.

Alice: It's included in the toolkit and also the person that I was referencing that works with FEMP is the one that actually wrote those guidelines *[laughter.]*

Liz: Great.

Alice: The right person to talk to.

Liz: Yeah, so the M&V 4.0 version from FEMP is a more detailed version of their previous M&V guidelines, and so it's got a lot of information on best approaches to determining baseline, and then of course how to measure those. So that's a great resource.

Jen: Okay. There's a question on how long do the terms in ESPCs typically last?

Liz: That's a great question. Sorry, go ahead, Alice, if you want to go first. I've got some information on that.

Alice: Okay. I was just gonna throw out what we have heard and then say that is actually one of the questions we'd like to document with more factual data coming in, and talk to states and localities across the country, but right now I would say probably up to 20. I've heard as long as 25 years in the public sector but more along the lines of 20.

But there are some places, and again it's based on the legislation and other conditions. Sometimes they limit the duration of a contract to much – a much lower number of years. So it does depend on where you are, of course but on average I would say the longest is usually around 20 years. Go ahead, Liz.

Liz: Right, and I was gonna say that again, this report that's forthcoming from Lawrence Berkeley Lab, we are going to report on contract term trends over time, and actually contract length has been increasing over the past 20 years or so.

And so we report by market and also by different kinds of retrofit strategies. So look for our forthcoming report and you'll get some information about that.

Jen: Okay, and we have one last question that just came in. How important is it for organizations to clearly understand their own performance levels for energy and maintenance before pursuing ESPC?

Specifically how realistic is it to benchmark energy use before your ESPC work is implemented?

Alice: Oh, so again I can start off and Liz and Philip, if you have some more specific information, please feel free to jump in. I would say from our perspective, from DOE's perspective and specifically in my office we highly encourage of course benchmarking before embarking on planning projects, and so we would say it is of the utmost importance, and we do encourage that.

It's very important from multiple standpoints, not just from the quantitative standpoint to look at, clearly understand what the baseline is before you put – decide which improvements to make, and then of course see what impact they have.

But it's also important then when you're looking at audit results from a firm and trying to assess how they make sense, and then how to implement them into your plans for those buildings that are under discussion.

So just kind of conceptually, it is all important before you embark on a plan that will then make sense strategically, and so that you don't kind of conflict with something that you might want to do down the road.

It might sound very appealing to do a lighting project but then later on you find out that you have actually stranded other savings by already having done the lighting. There's not that much more to gain by upgrading lighting further, if it's even possible, which then helps to pay for the longer payback measures in a comprehensive ESPC project, and that's really ESPC's strength is that it can make

a comprehensive project possible where even longer payback measures can be included.

So all of that, understanding where you are and what you – where you need to go is extremely important when you're making those specific decisions for individual projects. Anything to add, Philip, Liz?

Liz: I think you covered it. I mean just to reiterate how important it is to really understand the full range of potential savings opportunity in your facilities.

As Alice said, sort of planning that long-term strategy because if you really want to save the maximum and you want to improve your facilities, the fact that you can bundle longer payback measures with shorter payback measures and still pay back the entire project, it's really powerful but obviously it takes a lot of advance knowledge and planning to do that.

Alice: Planning, yeah.

Liz: Yeah, so benchmarking is critical, critical.

Alice: Critical, yeah.

Liz: Yeah, just repeating what Alice said but *[laughter.]*

Alice: Emphasizing.

Liz: Yeah.

Alice: Okay, Jen. I think we're maybe ready to wrap up the question portion.

Jen: Yeah, that was our last question that came in.

Alice: Wonderful, well thank you everyone for joining. With that, I would like to thank our two guests. Liz is my co-presenter and Philip is presenter for the tools, and thank everyone for being with us today. Please do feel free to contact us with additional questions or if we weren't able to get to your question during the Q&A period here.

You will receive an email notice when the archive of this session is available on-line. In the meantime, of course I'd like to invite you to visit the ESPC toolkit at the link that we saw on Slide 32 and we

hope that today's session gave you a good understanding of the first set of resources available in the toolkit, as you consider ESPC for your next retrofit, or if you're helping someone else going through that same process.

Please also mark your calendars for the second session of this ESPC toolkit series, scheduled for May 10th at the same time of day. We will be discussing the next section of the toolkit which is on implementing ESPC, and we hope to share with you some tips and recommendations on actual execution of a project, along with a state guest who will share their experience with one of the tools located in that section. So thank you, very much everyone, and have a great day.

[End of Audio]