

Pete Langlois: Alright, heard the magic words recordings in progress, and it is 11 o'clock Eastern here on the east coast good morning to all of you, joining us.

Pete Langlois: For our daily energy awareness webinars it is for those of you watching it later on the recorded version Tuesday October 26 2021.

Pete Langlois: Which means we have just one more after this one, but just a quick reminder This call is being recorded So if you don't want your voice picture all that recorded for posterity.

Pete Langlois: Then, keep it off, otherwise now you know, please move on to the next slide we are talking today about well, we will get into this first.

Pete Langlois: turn it over real quickly to eli levine manager, the better plans Parker Oh well, let me yes i'll introduce myself wait come back eli y'all ready to talk about the better climate challenges.

Eli Levine: Sure, I feel like the infomercial that you have to sit through before the program started but.

Eli Levine: thrilled to be with you here today it's great to see all the turnout across all of these different webinars are happy continued energy awareness month to.

Eli Levine: To everyone one thing we did want to raise awareness about so better plans for all this time has been asking folks to work with us towards ambitious energy.

Eli Levine: Water waste reduction goals that we are venturing into the carbon space, so we have a new, better climate challenge, where we are asking our partners to set.

Eli Levine: portfolio wide reduction in carbon know 50% over 10 years for those energy intense sectors that can be 25% and 10 years you and you can.

Eli Levine: Go back and seven earlier baseline if that's if that's a memorable for your existing corporate carbon goals so next slide.

Eli Levine: But we are really excited about this, not only does it help us move to currency important.

Eli Levine: topic of decarbonisation that so many of our partners are already starting to think about but it's really a way to expand our.

Eli Levine: Partnership with so many of you and expand the ways for viewing to work with you and to.

Eli Levine: expand our technical assistance, so we want to work with you, not only on showcasing what leadership is demonstrating a successful pathways but.

Eli Levine: The technical assistance that we offer, as well as that peer to peer learning collaboration aspect that makes us better buildings and better plants so special next slide.

Eli Levine: So what do we ask we want you to commit to reducing your carbon emissions to continue to pursue energy efficiency.

Eli Levine: participate in our working groups, you can learn from each other and get the most out of the program and then you'll continue to share your.

Eli Levine: Your data with us and, in return, we will provide robust technical assistance and tools and training and resources, as well as you know, facilitating peer to peer learning and providing national national recognition so next slide.

Eli Levine: So if you're interested in any of this and I really hope you will be there's ample reasons for you to be interested not only is it good for your organization in the future, but.

Eli Levine: All of these other resources, all of these other resources below there's no cost to participate, and we hope that you'll do so, so if you have any questions.

Eli Levine: Please reach out reach out to me the better plans team, the broader D team, thank you for considering this happy to answer any questions you might have about it.

Eli Levine: Later offline or whenever, so I appreciate you making the time for us to raise awareness about this and I will turn it back over to you for the webinar at hand today.

Pete Langlois: Thank you me like we are really excited actually about that expansion of the work under a better buildings and better plans programs for the better climate challenge.

Pete Langlois: So please you have any interest at all as eli said reach out to him, or if you're already part of our programs to your technical account manager.

Pete Langlois: It is, as I said before, and as you learn this month and what I didn't say before is I am pete longwall program manager in the advanced manufacturing Office here with Department of Energy.

Pete Langlois: I work on our education and workforce development programs and as it is, if you're tuning in to this webinar.

Pete Langlois: You are probably one of the 10 million people working in manufacturing in the United States or closely aligned with somebody who is.

Pete Langlois: And to that end, we understand that it is the skills and the innovation of those people that are going to drive.

Pete Langlois: And our manufacturing industries in the next decade and beyond, to be robust, as well as conserve energy while these energy awareness month.

Pete Langlois: I give me permission to be aware of your energy all the time and thankfully, we have the experts in the better plans program to help us be more informed about how to do that.

Pete Langlois: we've had a number of webinars already You can check out the recordings those on the better building solution Center we got one more to go, so if you're watching us live.

Pete Langlois: that'll be on Thursday at 1pm Eastern You can check out yes events COM slash energy awareness sign up for that that is yes events.com slash energy awareness.

Pete Langlois: The one today is understanding your water bills, I will say, for the last couple we've had about understanding those sorts of things, your electricity and natural gas.

Pete Langlois: To me and i'm trained in this sort of stuff it seems needlessly complicated, which is why I am glad that we have the experts here with the better plans for them.

Pete Langlois: To help us understand it and do better in terms of comprehending and using that information and the tools to make your enterprise that much more efficient.

Pete Langlois: let's see we will go on to the next slide as a reminder, so we got a pretty cool hour with you today, but please any questions you got for those were with a slide put them in the zoom chat.

Pete Langlois: If I see something that's going to be relevant right away to speak with our to bring up to our presenter Alex and I will do that.

Pete Langlois: If not, then we will go ahead and talk about everything, at the very end of our hour.

Pete Langlois: If you want to learn more about all of this, there are information sheets and examples galore energy.com slash bb sc that stands for better building solution Center energy.gov slash bbs see.

Pete Langlois: And with that I think it's about time to introduce our speaker.

Pete Langlois: Pardon me while I switch over to another window to remind myself and Alex box is a research associate at oak Ridge national labs and a technical account manager for the do we better plants Program.

Pete Langlois: She completed her bs and Ms and industrial engineering from West Virginia university.

Pete Langlois: Go mountaineers and she worked at the wvu industrial system Center during that time, which is where we actually met for the first time.

Pete Langlois: she's continuing to research, energy intensive systems at oakridge excellence and she's going to talk to you today about understanding your water bills over to you Alex.

Alex Botts: Thank you pete That was a wonderful introduction I really appreciate that um so yeah I just so let's say, welcome to the webinar talking about the understanding your utility bills water version.

Alex Botts: But before we dive in I really want to give a top level overview of the program so I know a lot of you live today, or maybe you're watching the recording later may have some idea about the program but.

Alex Botts: I just want to give you a brief little overview of what we do here at the Program.

Alex Botts: So this is the better buildings better plans program and our goal here is to really help those manufacturers and other industrial partners.

Alex Botts: improve their resource efficiency so it's not just about energy anymore right so that was the initial start of all this is increasing your energy practice productivity and being more efficient with your energy.

Alex Botts: But slowly, we have expanded our portfolio here at the program, so now we also include resources such as greater water saving so working better with that water efficiency.

Alex Botts: we've moved on to include waste and that focus, as well as more recently, like you know I just mentioned we're starting to focus on that carbon emissions reduction, so this is just a top of overview of what we're trying to help manufacturers industry do to improve their resources.

Alex Botts: So some of the resources here for particularly better plants program partners, we do have four main categories of resources that I do want to talk about today just for a moment.

Alex Botts: The first one, will be the low cost or no cost software and tools So these are completely free tools and software to you.

Alex Botts: So the most notable one would be the measure software, where we have over 60 calculators available for our.

Alex Botts: users, as well as full on assessment module so you can analyze your particular system, whether that be steam or eventually compressed air.

Alex Botts: pumping and fans systems, we also offer our partners a no cost tools equipment loan program so that program we will send you some equipment from our inventory, if you ask and help you find.

Alex Botts: Real data that you can work with towards setting your goals for your energy, water and waste productions.

Alex Botts: We also offer the finance navigator online so that is a database so look through the financing opportunities to finance these projects that you find.

Alex Botts: And then, finally, the no cost resources and guides so those would be dives just like this understanding your water bills, so we have a plethora and I will include the link at the end of the slides so you can go and see what other types of resources, we have to offer.

Alex Botts: The second resource category would be the training and education so that would be implant trainings mainly is when we like to point out.

Alex Botts: We have conducted over 120 implant trainings to date.

Alex Botts: We have since then gone virtual with our trainings and we've set up the trainings to be more of a course like understanding, where we meet for a couple hours once a week.

Alex Botts: To do a deep dive on a system, and this is really to help your employee education and to make them aware of those energy opportunities, where there's water savings opportunities.

Alex Botts: We also have over 45 webinars completely available for you, so this webinar you might actually be watching after the fact, and this is one of the pre recorded ones.

Alex Botts: So, other than that we have webinars from all types of systems from compressed air to fans to baseline in your energy so that's always available to all of you.

Alex Botts: The second resource that we like to our third resource, we like to point out is that recognition aspect of the program so we do offer a.

Alex Botts: Recognition nationally through the US so that might be media online through linkedin linkedin or Twitter.

Alex Botts: And that could also be finding solutions on the solution Center where we highlight some of our partners who are doing good case studies or good implementation models.

Alex Botts: And we do like to recognize all of our goal achievers that's the main you know really good recognition there have you reached your goal would like to point that out.

Alex Botts: The fourth and final category that we like to categories or resources into would be the innovation labs so as pete said earlier, I am at oak Ridge national i've been there are 17 national labs across the US.

Alex Botts: And this really offers a plethora of technology and information to our partners to be able to help work with the national Apps across the US.

Alex Botts: We also offer other things like lab technology days, where we will open up a particular lab and have our partners come see what's going on during that that time.

Alex Botts: So, for now, those are on pause but eventually we like to hope to get back to that and invite our partners back to see what's going on in the labs.

Alex Botts: And that last aspect we like to mention is a field validation program, so this is a newer pilot for the partners.

Alex Botts: Where we help them with some the MTV on the new technology equipment that they implement after facilities.

Alex Botts: So, most of our resources will fit into these four categories, as always, if you are a partner and you're interested about any of these resources or any of these particular categories reach out to your tam they know all about them and we're here to help you right.

Alex Botts: So what does good leadership look like So these are over 250 partners that are part of the program at the point.

Alex Botts: That still growing all the time, and we have more partners being added, and this gives a great opportunity for networking up from different sectors or talking to other people in your industry So these are really the leaders in that efficiency space.

Alex Botts: So, today, that was a little about the program so today we're really going to deep dive into is understanding your utility bills.

Alex Botts: So today i'll be speaking on particularly water bills and that's just one of the guidance documents right, so this is part of a series, so this is the third in the series of three for utility bills.

Alex Botts: We spoke about natural gas bills last week you're really giving insight of how that industry works and where your costs are going.

Alex Botts: And prior to that we also talked about electricity bills so that's a deep dive on how your energy is.

Alex Botts: really developed and made and where your costs are going and why do you pay certain fees and how to help you save money and utilities So these are all three available online right now again i'll put the link at the end, for your availability.

Alex Botts: But it's a great thing to try and understand all of your utilities.

Alex Botts: So a little bit about the the water guide you particular so water guys water bills can be a bit hard to decipher at times.

Alex Botts: So sometimes you'll get a very long bill loss of line items and you're not really sure why you're being charged a standby fee or fire line fee or whatever it may be.

Alex Botts: And it can be very long other times it's very short and they don't necessarily give you all that detailed analysis, maybe just a total of your bill.

Alex Botts: So really this guy is to turn help you find out what all those little charges are and how they add up to that total cost.

Alex Botts: Some charges on your bill may appear monthly I might even be a yearly annual cost, but so something you should be aware of, and something that you should know that on your bill.

Alex Botts: We do, we will be covering how these different fees are used, and why you're being charged them and where they initially come from and why they're being charged.

Alex Botts: And the guides overall will cover the basics of their water and sewer bills, I do want to clarify that this document that we put together in our webinar today.

Alex Botts: Is for utility bill water right so water that you would receive a utility bill for from a municipality or from a private water company.

Alex Botts: This is not include that source water that a lot of manufacturers use So if you are self sourcing that is not covered on this scope of this document rather you're talking about a physical bill that you receive from your municipality or a private company.

Alex Botts: So to start where's your water coming from how is it produced right so water is a bit different than the other utilities, we have looked at in a series.

Alex Botts: So natural gas and electricity are produced and distributed then they're used and effie in that's basically the end of the utility line right the energy is transferred into the product or move somewhere else and that's the end of that utility right.

Alex Botts: For water it's more of a cyclical path that will keep repeating itself over and over so once that water is used and discharge, it will rejoin the cycle can be treated and reused over and over again.

Alex Botts: So we'll see here, this is referred to as the urban water cycle, so this is a bit different than when we learned about no imagery school, the water cycle.

Alex Botts: Rather, this is the urban water cycle so where's your water going in the system, what are all the different stops.

Alex Botts: See we'll see if that we start at the top of the cycle, we start with your source water.

Alex Botts: That source water can be rivers, it could be lake, so it can be ponds right wherever that water's initially being coming from.

Alex Botts: So that water's pulled into our water treatment facility from that most local sources like ground waters rivers.

Alex Botts: water treatment facilities physically and chemically treat that water to balance it and make it to a portable level that you can then consume by removing those harmful substances and those pathogens that may occur in that natural source water.

Alex Botts: That treated water is then distributed through a system of pipes and pumps.

Alex Botts: Where does eventually reached by the end users, whether that be, commercial, industrial or residential and those are meeting sort of the end user to be in the situation.

Alex Botts: After that point the raw water that is used and dirty is collected via sewer system and pipe to what is known as a waste water treatment facility so you'll see, we have a water treatment and a wastewater treatment facility.

Alex Botts: This is where the wastewater is treated to a level that a seat can sit by the EPA and can be environmentally discharged.

Alex Botts: back into those local sources so after it's treated as pathogens bacteria or removed to the EPA standards, it has been read discharged and the whole cycle start again.

Alex Botts: So again, this is the urban water cycle, and this is the whole cycle that your your water will go through.

Alex Botts: So your cycle may be a bit different so you might get water, some of them may be sourced groundwater by yourself and you only get a certain percentage of municipal water, maybe you collect your rainwater maybe it's you have a lake nearby that you are able to use are you that you own.



Alex Botts: You might not have the same distribution system, you may have industrial water sources, instead of regular municipal water sources but, overall, this is the same cyclical path that water will pass through over and over again.

Alex Botts: So we talked about source water a little bit so let's talk a little bit about the treatment process.

Alex Botts: you'll see that there's four main methods there listen, so we like to come together collaboration and fluctuation.

Alex Botts: And that is method is more commonly seen in the water treatment, rather than the wastewater treatment, but it's still there.

Alex Botts: So the way that one works is possibly discharged chemicals are added to the incoming water and debris that neutralizes and negatively charged particles in the dirt.

Alex Botts: And it causes them combined together, and those are forming pumps that are called flock so you'll see in that that third image there the fluctuation image that that dirt is being clumped together and it builds these his flocks right.

Alex Botts: So due to that increase wait that flock will then settle to the bottom, and that form sedimentation right, so it separates that flock and the water.

Alex Botts: That layer of sedimentation then goes through a filtration system so once that flock of settled the remaining clear water is routed through a filtration system.

Alex Botts: Several filtration systems are used in the industry and there they vary in composition and pore size, so the bigger the pore that more than reach through the smaller the pore, the more it'll catch right just a normal filtration that you think about.

Alex Botts: Carbon filtration systems include activated carbon maybe reverse osmosis membrane or a mixed media so maybe you have sand gravel and terkel.

Alex Botts: or i've actually seen personally a several combination right so i've seen membranes be used and then they'll go use the filtration or vice versa.

Alex Botts: So you can have a variety of different filtration processes, the real goal of that filtration process is to remove dissolved and suspended particles, such as bacteria dust and chemicals from the water and you'll notice that.

Alex Botts: It does go through quite a few filtration steps in some areas and other areas might not be so rigorous of a treatment depending on that local water.

Alex Botts: The next step that we really like to mention would be that water treatment stuff so we call that disinfection.

Alex Botts: At this point, chemicals like Korean or core mine, or even UV lights can be used to remove any of the remaining impurities.

Alex Botts: This helps protected treated water from germs during the distribution to the end user, and it really keeps the water clean and tries to give you that potable water that you need or if it's a wastewater treatment it cleans it to that EP level of environmentally safe water for the environment.

Alex Botts: The methods, using the steps will really vary depending on the local water in your geographical region in the country.

Alex Botts: So you're not going to have the same water treatment, all of us right so water on the east coast will have different needs and waters on West Coast so there's different pathogens are different bacteria does that have to be treated depending on that location.

Alex Botts: The methods used will also have a direct impact on the cost of the bill, so if you're in an area that has naturally more.

Alex Botts: contaminants in your water you'll need a more rigorous treatment and, in turn, that will cost more on your water bills, whether it's your sewer bill or your water bill, it will cost more if you have to clean and that really makes sense and it kind of goes hand in hand.

Alex Botts: So we've talked about some source water and sewer water so let's let's talk about your real water bill right so here's a example of water bill that you'll see in the document and there's some key things that we like to point out here on your water bill that you should look.

Alex Botts: So the first would be the meter number.

Alex Botts: So this meter number is actually physically located on your meter and its way to ensure that your meter is the correct one on the bill.

Alex Botts: Sometimes your facility may have more than one meter and depending on your utility you may have multiple meters on one bill or you'll have a separate bill for each individual leader it's really up to the utility in that aspect.

Alex Botts: The second value we like to point out, would be that meter readings so that's the actual amount of water that your meter was read at that month.

Alex Botts: you'll see that this one is considered an estimated usage and we'd like to point that out, because sometimes you'll get an estimated reading rather than an actual reading.

Alex Botts: And that's when they are able to kind of predict how much you're going to use, and then the next month or two they'll come and confirm and adjustable accordingly, so in this case it's an estimated usage and not an actual reading.

Alex Botts: The next one, we like to point out, would be that usage charge that's your consumption or your usage charges on your bill.

Alex Botts: So that's the incoming water to your facility and the charge that you're being paid for it, so this bill was very nice and very straightforward and that it puts the right right on the bill for you.

Alex Botts: Depending on your utility you may not have that rate directly on your bill rather you might just have that \$304 listed and not how they actually calculated it, in which case you'll have to go back at your carrots and see what those values would be.

Alex Botts: that'd be the same thing for the sewer charge water is always separated into usage charge and supercharged.

Alex Botts: You may have a different entity that you're paying so you may have municipal sewer but a private water, so you can have a mix of bills, so one bill, maybe sewer one maybe water or like this one, it will combine the two.

Alex Botts: We also have a list of fees that hugely are seeing on your bill.

Alex Botts: And this case again, this is a very nice bill that lays everything out that we made here.

Alex Botts: Sometimes these fields, will just be come together and they'll say writers and give you the poll, rather than separating it line by line.

Alex Botts: you'll see the ones listed here are your metering fee sometimes utilities, will have a meter and fee and a customer feet, sometimes you'll just have a metering fee, and sometimes you'll just have a customer fee.

Alex Botts: really what that's paying for is for someone to come out and read your meter and actually look at that stuff but also provides your general customer service.

Alex Botts: This one also has your fire line fee which we'll talk about a little bit later and a storm drain fee, so all these are additional costs that don't necessarily have anything to do with your volume of water.

Alex Botts: And then the final line item is taxes fees and penalties, so a lot of states will charge you.

Alex Botts: State sales tax depending on where you're located and we will talk about state sales tax, a little bit further on in the presentation about how you might be able to wiggle out of that or maybe find an alternative to avoid those taxes.

Alex Botts: So I would like to show you some of these meters that we've talked, though.

Alex Botts: there's really three main meters that we see in the water industry right.

Alex Botts: So we have an analog meter a digital meter and a dial meters so they're all three slightly different but they all really will read the same number, some are just more modern, some are cheaper, some are bigger it all depends on what your utility users and how they read through meters.

Alex Botts: So notice on the first one is the analog meter.

Alex Botts: The way this one is red is the last digit actually does not move so that zero and the red box will always stays zero.

Alex Botts: But instead how you read that last digit would be that sweeping arm, so in this case it's in between six and seven, the sweeping are so it'll it'll read down to six, so this meter would be reading 3164 to six.

Alex Botts: So it's a little bit harder to hold on to and understand, sometimes, but once you know that last digit does not move it becomes quite easy to understand.

Alex Botts: The next will be that digital meter that has a solar cell to help power that digital LCD display, and this is the easiest one to read right we all can read this one, it directly puts the number right out there for quite simple.

Alex Botts: And the last meter would be the dial meter, and this is kind of similar to the analog meter but rather each dial is reading a different 10s place to see that the largest tens placing this one, it would be 100,000.

Alex Botts: And in that case you would read each dial as a different tens place you'll notice that all three meters are actually reading the 316,000 426 gallons is what this all three of them are reading right now, and yet they all look very different.

Alex Botts: you'll notice that all three leaders also have the units, so all of these say the word gallons on them.

Alex Botts: They also have low flow indicators, meaning that if you're able to shut down.

Alex Botts: And not have any float your facility, and this would continue to move that actually be a sign of a leak so something else is still consuming water.

Alex Botts: it's really there to indicate that flow is happening right and that's just one way to look for leaks at your facility.

Alex Botts: you'll also have your meter number that I mentioned, from your bill located on this meter.

Alex Botts: And then, finally, the meter size is also commonly see here so you'll see on this one, we have five eighths of an inch for that meter size.

Alex Botts: Something else we do like to point out is that, depending on your meter size, it could also increase or decrease your costs, so if you have more flow and require that higher diameter of your piping, then that that cost goes up right.

Alex Botts: So meters, are the main way we actually get those consumption charges.

Alex Botts: So water consumption or usage is the total amount of water that your facility uses to make products.

Alex Botts: Or has there for that comfort water, so that is your incoming water that you're being charged for so that is clean water from the water treatment facility through the distribution pipes.

Alex Botts: Usually in the US, it is measured and gallons or cubic feet, a lot of times you'll also see in hundreds of cubic feet, so that will come out as CCS so it's another Common Unit to see here in the US.

Alex Botts: The final thing we'd like to point out, as well as that, sometimes, without a sewer meter.

Alex Botts: This value will also be used as your sewer volume so, even though this is technically the incoming water that is being read.

Alex Botts: If you don't have sewer meter or evaporation credits or things, subsequent to that, then you don't actually have a volume, so they assume that this will be the same volume.

Alex Botts: let's talk about surcharges little bit so you'll see that this is the other portion of that urban water cycle so after it leaves the commercial, industrial or residential users.

Alex Botts: It is collected through those sewer pipes in that district or that system to gather that sewer and then goes to the wastewater treatment facility.

Alex Botts: So your sewer charges are actually use to fund the wastewater treatment and that's why they separate it so wastewater treatment is for your sewer charges.

Alex Botts: Like I said earlier, without a sewer meter the sewer volume assumed to be equal of the incoming volume so in simple words water in equals water out and water utilities mines.

Alex Botts: So, depending on your industry, this may be pretty close your losses may be negligible and not be worth putting in a sewer meter.

Alex Botts: In which case, water and water out works for you, but and other industry so say beverage or food or chemical right you consume a lot of the water into your product your product is made of water.

Alex Botts: So water based products are leaving your facility, in which case it might be worth looking into finding out about a sewer meter.

Alex Botts: To help you avoid some of the sewer charges if you're not actually using the sewer so that's the ideas, if the water is not going into the sewer you shouldn't have to pay for that wastewater treatment for the water that's not there.

Alex Botts: So just something to keep in mind, depending on your industry in your sector.

Alex Botts: So, like I said, if the process consumes a lot of water, you can either install a sewer meter the second option would be to apply for an evaporation credit.

Alex Botts: So evaporation credit doesn't always technically means the water is evaporated it just means that it's not going into the sewer.

Alex Botts: So some examples of that would be cooling towers so maybe you're losing water from your cooling towers and your your bleed off rates and such.

Alex Botts: So we do have an example, I will talk about that momentarily but that's a great way if you can't get in a sewer meter.

Alex Botts: You might be able to find a way to get credit for evaporation credits.

Alex Botts: Depending on a utility this could be just a little bit of extra data right just a little bit of something extra or it can be a lot of data and they need daily numbers or hourly numbers ethan.

Alex Botts: So if you're interested in those evaporation credits I highly suggest reaching out for utility and finding out what they require, because every utilities, can be a little bit different in their requirements.

Alex Botts: The final thing to know about surcharges is some facilities can treat their own water.

Alex Botts: So I do know, several of my partners actually have to treat their own water, and then they discharge it into the local sources.

Alex Botts: To do that, they have to treat the water to meet the EPA standards and this way they're avoiding that sewer treatment charges or possibly surcharges which again we'll talk about later.

Alex Botts: So do you want to go over a quick example for the evaporation credits for a cooling tower in this case.

Alex Botts: So, to give you a little heads up or a little intro right and manufacturing plant uses chilled water for both process and comfort water, the chiller is water cooled and utilizes a cooling tower for heat removal.

Alex Botts: The plant will add makeup water to replace the evaporated water from the tower and simultaneously it discharges to bleed off.

Alex Botts: So, to maintain the appropriate concentration of those dissolved solids so.

Alex Botts: To help figure out if they can get evaporation credits, the plant monitors both the makeup water rate and the bleed off rate, so the difference between those two would be that evaporation volume.

Alex Botts: So, because they have those two values and their utility is willing to work with them using those two values they are actually able to apply for the credit, so how much you think they would get for that credit.

Alex Botts: So first thing we have to do is calculate that evaporated water volume, so we find that by again finding the difference between the makeup water and the bleed off water and the difference, would be the water that was evaporated.

Alex Botts: So in this case, you will have that 12,000 gallons a day minus that 4500 gallons a day to give you a grand total of 7500 gallons of day that is being evaporated from the facility.

Alex Botts: So from them simple calculation it's going to be that evaporation credit savings is going to equal you by operation rate.

Alex Botts: Times that sewer rate because that's avoided sewer costs in this case and that's the way that this particular utility set out there evaporation credit program so we just take that 7500 and we multiply by an average of 30 days a month, so you know full.

Alex Botts: 28 or 31 so we're taking an average of 30 and then that 30 cents per gallon and that will give you a grand total of \$8,100 a year have avoided sewer costs.

Alex Botts: So this is a really a great example that my colleague came up with um and it's something that's very useful manufacturing to know about again so you want to know more, I encourage you to reach out to your facility.

Alex Botts: So we're going to talk about industrial water and industrial sort so earlier on in the urban water cycle I showed you that it was a municipality in that case that was treating the water.

Alex Botts: Delivering the water and then taking the raw water and treating again, but in the industrial world we do have something called industrial water.

Alex Botts: So this industrial water is one not as rigorously treated as regular municipal water, the idea with this water is you might have.

Alex Botts: A process that doesn't need as clean as water, so for a more non sensitive products, maybe it's using quench water right you don't need super clean water for that.

Alex Botts: And because it's less rigorously treated it's going to cost less than that municipal water, so you can actually save money by using an industrial water source and depending on where you're located your utility may have that source for you or you may have to find a third party for that.

Alex Botts: The second part of it is industrial sewer right, so this means that your water is industry industry really dirty right so it's more dirty than your regular municipal treatment Center can take care of.

Alex Botts: So this means it's a longer and more involved treatment process at that treatment Center.

Alex Botts: So this is used when waters to contaminated right, so they can't take out all the chemicals and and all the added pathogens or pieces of your your product right, so they have to outsource that or they have a separate facility for that.

Alex Botts: Because it is more rigorously treated and it will cost more than the municipal sewer and that's just something to keep in mind, and we will bring that back up in a few slides.

Alex Botts: So writers and fees.

Alex Botts: Several other charges can be listed on your bill, and in a lot of cases they'll have nothing to do with your volume of water or volume of sewer they're just additional fees that you have to pay to help upkeep the distribution system or.

Alex Botts: To help you know pay for all those additional pieces.



Alex Botts: These are also called writers or modifications your rate structure, so it may be an additional line item on your utility bill, and these items are you usually extremely descriptive and are used for very specific purpose.

Alex Botts: So, for example, a storm drain fee that fees actually calculated, based on the amount of porous ground that you have around your facility.

Alex Botts: So, the more you build the less porous ground, you have to retake the water right, so the water cannot go back into the ground because you're building something on it.

Alex Botts: So, to help offset that the extra water has to go to storm drains so that storm during fee is actually used to help upkeep the storm drain lines a fire line fee would be a fee that you have to pay if you are being.

Alex Botts: If you have separate water lines for a fire so for a lot of facilities, this is just in case water right, so you shouldn't ever have a volume listed on your fire lines fees unless your fire line goes off right.

Alex Botts: So that might be an indication of a leak or your filing fees may have been used in case of an emergency, so that see is there to say that at all times, you will be provided this amount of water and it's ready for you to use as a drop of hat, which is a good thing.

Alex Botts: The third one, which I thought was a bit more interesting was the standby fees so there's actually two different reactors for standby fees.

Alex Botts: So first a standby fee can refer to a fee that's imposed on undeveloped property, so you say you own a lot of property right.

Alex Botts: In the anticipation that it will one day require potable water sewer or drainage so it's kind of just saying oh you're getting ready to build maybe we should.

Alex Botts: Go and gather that charge, so that we are ready for you when you're ready for the water.

Alex Botts: The first type of stamp IP that I just mentioned, this is typically collected with your property taxes but you'll see it as a standby water fee it's typically not on your bills, but it can be on your property taxes, the second type of standby fee.

Alex Botts: it's similar to the electrical demand response programs right so demand response being that.

Alex Botts: Too much demand on the grid, and they have to have everybody off the grid, so that they can divert power elsewhere.

Alex Botts: So you may see a standby fee and drought prone areas or in rural areas, where the majority of the local water is consumed by industry, so if you're in a small town has lots of big manufacturing, you may see this fee.

Alex Botts: It happens in times, where water demand is higher than the supply the utility company can call what we call an event.

Alex Botts: Where an industrial consumers are instructed to reduce or stop their water consumption for a period of time that way it can be rerouted to residential areas hospitals or emergency services.

Alex Botts: If you do have this fee if you don't respond to a standby event, this is a penalty that's on your bill for not reducing your water enough to help support those emergency services so that, as a general standby fee.

Alex Botts: The last one I really wanted to point out in the document was the sewer treatment surcharge so I spoke early over industrial sewer where your water might be a little dirty other than municipal can handle.

Alex Botts: So a sewer treatment surcharge means you have dirty water, but the municipality can handle it with some extra chemicals and some extra treatment.

Alex Botts: So this may be, you have too much of a particular metal in your water and you'll be charged extra on that, based on the amount of that that metal in the water, so it's just an extra charge to help pay for that extra treatment that you're requiring of human sexuality.

Alex Botts: So let's talk about non water charges So these are some things that I am thinking do with water at all right, so the ones we just mentioned the your storm during fee your fire line for your stand by for all those still have to do with water right.

Alex Botts: So some other charges, you may see are not related to your consumption at all on.

Alex Botts: These are normally fixed charges and they're built into your rate structure and but making sure you're on your right rate schedule can actually save you some money and that's something we'll we'll speak about a little bit later as well.

Alex Botts: Some charges can be avoided, with just a little bit of planning and would you like to point that out, that you should check your bill every now and then and make sure that those charges and those fees can't be avoided.

Alex Botts: So some examples would be customer fees or metering fees late payment fees or insufficient fun fees So those are examples of ones that can be avoided right so late payment fees, when you pay past that date.

Alex Botts: Sometimes papers get shuffled and it just you miss a payment right or you you're late, I just a couple days.

Alex Botts: So I can't tell you how many facilities i've seen that if they just scoot their payment method and how they do it just a few days, it would save them thousands of dollars a year so that is something to keep in mind every now and check your physical buildings, he was on.

Alex Botts: The third one down there that list would be local taxes and state sales tax I did mention that earlier.

Alex Botts: But I want to say that some states will allow that state sales tax exemption for manufacturers.

Alex Botts: So if you can prove that a certain percentage of your water is going directly to manufacturing depending on your state, you can actually get that tax removed from your bill.

Alex Botts: So, depending on your state so here in Tennessee we're over 9% That would be a 9% discount on your bill.

Alex Botts: So it really it's free money if you just apply and can prove that you need it and some cases that will mean you need a predominant use case study and that again is something you need to contact utility about every state is a little bit different but reach out you never know.

Alex Botts: that the next ideology here that we really want to talk about is a true cost of water.

Alex Botts: So if you're unfamiliar through cost of water, this includes all of the cost per unit of water and you'll see in this graphic here that, on your bills you'll see.

Alex Botts: On the left a charge for your in the Gospel water so it's the water you receive an incoming side.

Alex Botts: or also the sewer water would be on your bills, but are you thinking about everything in between right, so what happens after you get the water in your facility only you might have to pump it, you might have to treat it more for your own process, maybe you heat, it may be cool it.

Alex Botts: You know, maybe you do the wastewater treatment at the end, as well as regular sewer water.

Alex Botts: So true cost of water is really the idea of the summation of the entire cost for that gallon that you brought into your facility so and, sometimes, this can be double or triple the cost of your water that's on your bill.

Alex Botts: They use this value, a lot of manufacturers do to better evaluate possible projects and your cost savings.

Alex Botts: So you're not just saving your utility bill you're also saving energy right to save energy, because you're not pumping you're not heating you're not cooling, so the gives you a better macro understanding of that cost of water.

Alex Botts: I do want to point out that the better friends program has developed.

Alex Botts: The plant water profile to, and I have looked at here on the slides but, again, if you just Google pw px you'll actually find it probably one of the first ones to pop up.

Alex Botts: This is an excel add in that way it's very easy to use and very easy to download and i'll ask you all this information about your water and where where it goes what happens with a do you have chillers they're using steam.

Alex Botts: it'll help you actually calculate that true cost of water, while also helping you balance your water so water balance your facilities and also a very important part of this tool.

Alex Botts: So now let's move on to rate structures, so we talked about your sewer water and there is a charge, but what are those charges right so there's several common pricing options that you see in the water.

Alex Botts: So one would be a uniform rate where no matter your consumption high low you're going to have the exact same unit costs on the whole time.

Alex Botts: The next would be block right, so the first one be decreasing block right.

Alex Botts: So with decreasing block rates, the unit cost of water decreases as more waters use after that consumption tears full.

Alex Botts: usage moves to the next block and it's a little bit cheaper rates, the more you use the more those tears fill up and then the cheaper, it will be per unit, as you keep going.

Alex Botts: This rate is most often found in rural areas for agriculture news and heavy industry in regions where water is plentiful there's lots of water and they want to encourage that manufacturing and that agriculture.

Alex Botts: The second is the increasing block rate, this rate system encourages conservation, by increasing the cost as more waters consumed.

Alex Botts: Increasing block rates are commonly found in more urban areas where the water supply is not quite plentiful, and if you really use to help be more restricted on your water usage so encourage that conservation of water.

Alex Botts: The next step is time of use pricing and there's two main ones that we'd like to talk about the first would be the drought rates so.

Alex Botts: The two most common uses our drought rates and seasonal reads.

Alex Botts: The drought rate is found in regions where droughts or experience intermittently so it's common for droughts darker so they build it into their tariffs.

Alex Botts: One rainfalls limited the water in the cycle is lesson in our requires is regions to conserve water.

Alex Botts: During drought seasons rates are adjusted upward to discourage usage.

Alex Botts: And the important part of this one is the higher the level of drought, the higher the unit costs and the structure is really meant to conserve water during those specific drop times.

Alex Botts: So again, the drought level will determine the cost, so it is a varying structure, the second time of use pricing is seasonal rates.

Alex Botts: season what rates are similar to drop rates in that water cost more particular seasons rates are usually increased in the summer and this one.

Alex Botts: When less participation occurs and a decrease in an offseason that have more or that regular precipitation the rate is a little bit different and drop rates and the fact that's either on or off yes or no, rather than a varying level.

Alex Botts: And it really it has not necessarily anything to do with the drought levels, but rather is there enough precipitation for the supply of the system.

Alex Botts: So do you have a quick example about decreasing block rates so in this case manufacturers total consumption was 520 4300 gallons for the month.

Alex Botts: How much as their consumption charge using the block rate below so you'll see in this case that we have a 40 year block rate.

Alex Botts: Decreasing block right so you'll see as they go up in units they actually go down and the cost per thousand gallons.

Alex Botts: So their total is 520 4520 4000 gallons so as they fill up each block they move to the next rate so you'll see that column, it says customer volume and block.

Alex Botts: A 1500 and 28 and then in Block three they can't fully feel that block so they don't go on to block force instead they stopped at Block three.

Alex Botts: And you'll see on that total volume column that that volume does add up to their total volume and that has the charges associated with each block.

Alex Botts: And then, finally, to find the total costs for that consumption turnkey will just add all three of those values together, so in this four block system they didn't quite feel all three books and their total costs would be \$3,582 and 64 cents.

Alex Botts: So I also want to bring up a calendar ization so I noticed that seemed like a long fancy word but it actually has great meaning and it will actually highly impact your utility bills.

Alex Botts: So something to point out is building periods will depend on the when the utility rains your water meter so.

Alex Botts: They might not read it at the first of the month, every single month instead they might read it on the fifth of this month and the eighth of the next month, so that's something to keep in mind.

Alex Botts: normalizing that water and sewer data for those billing period that's known as calendar ization like I said.

Alex Botts: And the way we find that, as we divide the consumption my days when the bills and allocate the water to the calendar month so say that you have three days and the next month.

Alex Botts: So we want to be able to shift that water so that your production and your water consumption line up so that it goes from the first of the month, so the last day of the month.

Alex Botts: And to give you just a little bit of graphic here you'll see that the darker circles are the start dates for the billing period so in December that was 19.

Alex Botts: The 19th and then the 18th and then the 20th so they're all within just a few days, but they're all slightly different so you'll see that in December they're really having 30 days on that bill and the January bill had 33 in the next only 24.

Alex Botts: And what we like to point out is that that isn't going to line up with your production values right, so your production values are normally from the first of the month, at the end of the month.

Alex Botts: So, by doing this calendar ization process, you get a better understanding of how your production is actually impacting your water.

Alex Botts: to learn more about calendar ization I would suggest checking out the baseline and guidance document that we've produced them talk about earlier in the month also you can feel free to contact your Pam and they can show you how to do this calendar ization process.

Alex Botts: And then finally to wrap up let's talk about opportunities that you have for cost and energy savings, so how can we save money by just using your bills right so let's not change the volume of water, but just changing things about your bills.

Alex Botts: So that first one, like, I meant wouldn't be that sewer water meters so let's avoid those who are costs if we can and meter the outgoing water.

Alex Botts: So that one, it is not available for everyone, but if you think that your water is being consumed in that manner at your facility, this may be a very viable option.

Alex Botts: The second would be that evaporation product that I mentioned earlier, again evaporation doesn't necessarily mean that water has been evaporated it could be injected into the product like I said, but it would still qualify for evaporation credit if you don't have a sewer meter.

Alex Botts: Every utility is different again if you need help reach out to your facility i'm sure they're willing to help you.

Alex Botts: The third would be discharged water to the appropriate places and what I mean by that is make sure only industrial water is being classified as such.

Alex Botts: So if you are using industrial water and you're i'm sorry you're discharging that industrial water, make sure you're only it discharging the dirty water to that sewer.

Alex Botts: Rather, you can divert the comfort water that you're using so sinks or kitchens, to the regular municipal water, and that would save you some money there.

Alex Botts: And on the flip side you suitable source of water so don't use municipal water, if you can use industrial water if industrial water meets your needs and does not affect your quality, the quality of your product or your process.

Alex Botts: look into industrial water, it may save you quite a bit of money.

Alex Botts: of waiting like seems like I said, sometimes that can be immediate savings for you by just paying your bill on time.

Alex Botts: The next would be analyzing your water usage, so this would be trending your water and seeing anomalies, so why is your water spiking in this particular month, it may mean a leak, it may mean a poor practices somewhere that you can uncover just by analyzing your bills.

Alex Botts: The next one, is that tax exemption, so you might need to do a predominant use study like I said earlier, for this one, but it will save you some money immediately.

Alex Botts: And then the final one that we recommend is every now and then just recreate your bill pull up your tariffs go through your charges line by line can utility bill and see what's going on.

Alex Botts: there's you know, one of three things is going to happen, you can either do the calculation and it matches your bill.

Alex Botts: That works right that's what you should get that's what you want to see.

Alex Botts: The second option would be you realize that you're not on the right rate structure so maybe you're being charged for large industrial really it should be small industrial.

Alex Botts: And then the final would be the calculation error there's something wrong and then you would go to utility and try and get that corrected so, these are the main ways to save on your water bills without changing that volume of water so.

Alex Botts: That is all I have for today, I did include the link down here on this page, so if someone would later like to go look at all the resources and guidance documents that we have just look at the better plants resource library.

Alex Botts: i'm gonna turn that back over to up.

Pete Langlois: Thanks Alex and we appreciate that, so we still do have a few minutes before our time is up, so a quick reminder, if you do have questions for Alex then please put them in the chat.

Pete Langlois: Otherwise, I will get started and we'll remind everybody here as we get to the very end, about our last webinar coming up on Thursday October 28 Alex I am.

Pete Langlois: not really relevant to to what you were talking about, but I pulled out my physical bill.

Pete Langlois: For my house here, which is a lot simpler than what you mentioned, but I didn't write down your note every once in a while check your physical bill.

Pete Langlois: That you talked about in here just in the last bit about recreating your bills, but.



Pete Langlois: When that happens, and say people don't do it very often and they come talk to their account managers like yourself what is the, the main thing I guess it surprises them or the thing that you find out that like Oh, you can easily make a change.

Alex Botts: So i'll say a lot of people are charged their incoming water to equal their sewer water amount right so for residential on your bill there your sewer water volume probably matches your incoming volume.

Alex Botts: Which is normal for a residential place right, but if you're using a lot of water in your process that's something you have to consider your water might just be.

Alex Botts: In your product right and you're being charged overcharged for that sewer if you're not careful, so that's that's the thing I would think that surprises, most people is to see those values equal each other.

Pete Langlois: makes perfect sense you, you did talk about things you can do without changing the amount of water you use now, obviously, certainly if you're on ones rate structures, where you're going to drop prone area or.

Pete Langlois: You have other considerations you're probably thinking about you know, potentially, you know, reducing your water usage.

Pete Langlois: And then there's all those attended costs that I really honestly and thought of until right now is that something you guys work with people frequently on in terms of understanding the full benefit that they might get by changing their their water machine, if you will.

Alex Botts: right for that that's kind of out of the scope for this particular document, but the program actually will have some suggestion for water reduction.

Alex Botts: So this document actually focus more on not changing that volume right so just the utility analysis.

Alex Botts: However, using the p wp tool that I mentioned, you will get a better idea of if you do reduce your water, how much will you actually SAVE, so we do like to point our partners to that pw P tool to help them understand their true cost of water.

Pete Langlois: Thank you, you mentioned the different rate structures and I will admit i'd never heard of a decreasing Blocker because that would seem, you know antithetical to conservation as you brought up.

Pete Langlois: Are those sorts of things that individual entities can negotiate with a utility or is it just kind of a given this is the rate structure that the utility offers and and you're stuck with it.

Alex Botts: So again, that would depend a lot on your particular utility provider, so if you are an extremely rural area with not a lot of customers, that is something you can talk to your utility about.

Alex Botts: So bring it up talk to them, they may have a different tariffs that you can get on that would make more sense so for you and I, as a residential customer.

Alex Botts: You get what you get for that, but for the industrial there may be a little wiggle room you just have to ask sometimes so that would be my suggestion on that one.

Pete Langlois: Thank you, I appreciate that yeah and I will also say I not really thought about the diversion issue in terms of.

Pete Langlois: Your industrial water and how that's counter the industrial sewer actually and how that's counted is that fairly typical is that something that needs to be revisited it a lot of facilities.

Alex Botts: So, not all utilities actually provide it um and it is not always available in all regions rather it's something that's going to take a little bit of digging for your own region.

Alex Botts: So in that case you might get water trucks off right, so you may have water trucks at come and gather that water and dispense of it in an appropriate manner.

Alex Botts: But in other situations, you can have a completely separate sewer system attached to your facility so that is discharged directly to the industrial sewer again, it is a very regional thing and it's something only in the industrial sector right so it's not something we're gonna see but.

Alex Botts: It all depends on your particular utility but again just ask you never know until you ask there's a lot of things hidden in those tariffs if you're not aware of them great.

Pete Langlois: Thank you Alex as quite a bit to think about and I will say kind of wraps up a three session series we've had here in terms of looking through your utility bills.

Pete Langlois: Both your electric bills and your natural gas bills, if you have those at your facility so thanks again for all of that, I will point everybody out and remind.

Pete Langlois: What Alex mentioned For those of you watching this later on, especially you can check out the recordings of our previous sessions, as well as find all the documentation that she was referring to, and then other hosts are referred to.

Pete Langlois: The bitter building solutions Center, that is, the better building solution Center on the.

Pete Langlois: Daily website one last thing for those who are watching this live here on October 26 we have one more event coming up on Thursday that'll be 1pm Eastern.

Pete Langlois: 10am Pacific, you can find out more about that it's in the chat box right now the link to sign up for that.

Pete Langlois: Yes, events COM slash energy awareness, yes events COM slash any energy awareness that when I believe will be lessons learned from our better plants goal achievers.

Pete Langlois: So there'll be a lot of insight from what other organizations have done, maybe one of your organization system.

Pete Langlois: That we will find out more about on Thursday with that Thank you again, we appreciate you and look forward to seeing you on our last and final energy awareness month webinar on Thursday take care and have a great rest of your day.