

Dave: Good evening, everyone! Uh, if I could have everybody's attention. Uh, it is 05:00 and, uh, we have a lot to cover tonight. So, uh, if everybody can find a seat, we're going to go ahead and get started.

I'd like to welcome everybody, uh, to our event this evening. Uh, we have put together an event to answer questions that you all have with respect to our Sustainable Return on Investment Analysis and our Generation Options for the Holland Community. And I'm very excited, uh, about this and I'm glad that you came tonight.

Uh, with me, I have Dan Nally. He's our Business Services Director. He'll be helping to answer some of the questions tonight, and also Jim Connell. Uh, Jim is, uh, the Principal at HDR's offices in Ann Arbor and, uh, Jim's group is primarily involved with doing the capital and operating cost assessments for the various generation options of looking at, uh, and really did the installed the... how to build the stuff, you know, how to put it together.

And also with us on the phone is, uh, Dennis Bruce, and Dennis is with HDR's Decisions Economics Group. Uh, Decisions Economics within HDR is primarily responsible for, uh, doing the Sustainable Return on Investment Analysis. So running the models, working with the community to come up with the, uh, the process that's going to be used. And so Dennis, uh, is also available by phone. He's in Toronto, I believe, right now and so he'll be available to answer questions about the, the actual Sustainable Return on Investment model.

00:02:00 Uh, also I have some other people in the room that will be helpful, uh, this evening to you, Angela Badron and Chris Van Dokkumburg. They are with the Holland BPW and they have cards, okay. Um, the format we're going to use tonight. We have received a number of questions, uh, from interested, uh, parties with respect to, uh, the Sustainable Return on Investment Analysis through our Internet Portal, our P21 website, and we'll be going through the, uh, responses to those questions.

But we also have cards available that if you want to either supplement or, you know, ask something, uh, a different topic, uh, or a different area of the plan you have a question about that maybe you've submitted before or maybe it's your first question, uh, they have cards available for you to write that question down. We'll be receiving those back from you so that we can, as a panel, uh, review those.

Now because we have a number of questions tonight, what we are going to try to do... um, the last person I wanted to make reference to in our group is Ted Siler. Uh, Ted is our Operations Director and also has the unenviable task of trying to group, uh, these questions together. Uh, and Ted will read through all

the questions if it's related to a particular topic. Uh, we'll get through all those questions, and as a panel, uh, we're going to try to, you know, work, work through those so that we are able to, uh, you know, address the different topics and questions associated with the plan.

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And so, you know, that makes up the group that's involved with sort of handling the event tonight. Uh, my name is Dave Koster. I'm the General Manager of the Holland Board of Public Works. And, uh, before we get on, some of you may, some of you may not have seen the August 8th presentation, uh, that HDR put out for the Sustainable Return on Investment. So I have a very short, uh, you know, summary of that that I'd like to run through. It take about 10, 15 minutes to run through that. And then also at the end of that there are some slides that I put together that sort of [gotta] answers maybe some fairly large topics that we've heard, you know, through the, uh, um, you know, last few, few weeks, you know, that we've been talking about this issue.

First of all, is my volume okay? Am I too loud? It sounds loud to me. But anyway, okay. Good enough. Uh, let's get started with that.

So, you know, what is the Sustainable Return on Investment Analysis? Well, I think it's a very unique approach, uh, and HDR would say that this is... you know, we're the only utility, I think, in, in North America that has done this approach for power generation resource of this kind.

Jim: To this level, for sure.

Dave: To this level for sure, okay. So, uh, this approach is one that takes into consideration not only financial impacts but also societal impacts in the evaluation. You're looking at the environmental, social, economic, triple bottom line approach to evaluating, uh, generation options, uh, and really this model can be used for a number of different decisions that a community might face. We're applying it to a power generation option. It looks at, again, triple bottom line, looking at... really adding to the financial analysis giving the community leaders and the community itself, uh, eye into what are some of the other factors at play when you're looking at the different options here. So not only the cash impacts but some internal amount of cash impacts and also external, uh, costs and benefits.

We did a process here that's been ongoing for about a year now. Uh, we kicked this process off back in, uh, September last year. We assembled a panel called the Risk Assessment Process Panel or RAP Panel. That RAP Panel is made up of constituency throughout the community, uh, involving groups, uh, special interests groups involving business, education, uh, government. Uh, and so we

00:06:00 had a very broad, uh, cross-section of the community involved in the entire process from the beginning of the development of this model.

And the group was brought together really to help develop how this evaluation is going to take place. They looked at what are the inputs going to be to this evaluation? What's the structure and the logic of how we might evaluate this? That group was also not only quantifying the input and data assumptions. If we wanted to look at water quality of Lake Mac, you know, how would we evaluate that? If we want to look at, uh, impact of toxics, uh, to the air environment or greenhouse gases, what would be the studies that we'll look at in terms of that? Uh, if we wanted to look at the value of, uh, snowmelt, you know, all these things were items that were discussed within the context of this Risk Assessment group and in consultation with HDR as a decision that [inaudible 00:06:54] group.

Those, those things, once they're quantified, then HDR will set out to do their work, involve a number of different... was involve the studies that we looked at for the various externalities. They looked a lot of internal factors such as price assumptions for natural gas and coal and emissions and a lot of other things, uh, and they ran sensitivities on all of those things. High and low gas projections, middle gas projections, uh, you know, what's the, uh, uh, potential, uh, range of- of costs associated with some of the externalities and not just a static number? And, and they went and brought all that together in a probabilistic outcome which has been represented in a number of graphs that I know people have seen over the last few weeks, uh, but they're called these fancy little S-curves. And, you know, because you don't know exactly what the results is going to be, it's going to be some range of expected output, you know. We don't know exactly what the price of natural gas is going to be, but we have a range of probability around that.

00:08:00 Um, you know, we don't know what all the studies are showing with regard to greenhouse gas impacts, uh, from a societal perspective, but we have a probability around various studies that are done. And all those things go to and form a graphical output which gives you a range of expected outcomes, and, and the idea just to be able to understand within that range of outcomes, how does that line up with other scenarios that we might be able to deploy, uh, as opposed to, uh, maybe a base case that we've talked about.

So when you do a Sustainable Return on Investment Outcome, you might get a different output than what a financial return might derive. Because you're thinking about things like environmental community impacts, if you have a technology deployment, call it Technology X, but you have maybe renewable energy to it and call it Technology Y, because it's X plus renewable, you might change the total bottom line here to where you consider those externalities. The

renewable impact is enough to satisfy a better Sustainable Return on Investment than just Technology X alone. That's the idea behind the SROI is to be able to look beyond the financial into the societal and other, other benefits and costs.

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So again, how do we do this? We brought together this RAP Panel, did extensive day-long sessions with, uh, the RAP Panel that go through both the structure and logic and also the range of values and risks. We-we did additional research and interviews both locally and, uh, for example, water, the impact to the water quality of Lake Mac. HDR interfaced with Dr. Graham easily of Hope College to look at some of those factors based upon, uh, the various things that we were doing, uh, and the assumptions we were making in our power supply, uh, process. So interviews were done. Additional research was done. Resi—refinements to the technology options were done. We grouped generation options within a-a myriad of scenarios those represented on these poster boards that we've seen. Uh, and we developed the SROI models and looked at everything relative to a base case.

Why do we do that? Well, the base case has always been the assumption of what if we build this circulating fluidized-bed and then we got a permit for cir—circulating fluidized-bed. The Community Energy Plan looked at, uh, greenhouse gas emissions and a target of reducing that over time, and they did that analysis relative to a base case which was that circulating fluidized-bed option.

So we did things consistently with the community energy plan in terms of identifying the base case and then the alternatives to that to try to understand are there better financial return on investments, uh, with different scenarios? Are there better social or societal return on investment, uh, with those various things? So all the things that we've seen in the report, the results are all incremental or against the base case.

You know, we had to consider things about the existing De Young Station. James De Young, you've seen that, uh, image? It's on [inaudible 00:11:109]. Uh, you know, in all cases, we retired the oldest generator there. That generator is the one that serves the snowmelt system at Holland. So, you know, we had to look at, you know, reconfiguring another generation option to take that over. We had some scenarios where we didn't invest any new capital in those units because we figured that, uh, the cost of the controls may be too great, uh, to actually put on those units and be able to recover that investment. So we have some scenarios where those units— the other units there are retired; some scenarios where that investment is made.

We have other renewable generation options within our, uh, portfolio of-of different scenarios. Uh, wind, solar, uh, digester, which is taking your wastewater treatment plant bile salts and digesting it to make a methane gas so

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you can actually run generation with it, and a conversion of, uh, one of the units at the De Young plant to burn wood or biomass.

We've looked at new generation techniques with state of the art controls like circulating fluidized-bed technology which burns multiple solid fuels, petroleum coke, biomass, and some coal. It can also burn tire-derived fuel. And we looked at iterations of a natural gas combined cycle configuration. Natural gas combined cycle, what it is? You take a gas basically, and you run, make electricity with that using natural gas and that has a lot of waste heat. And so with that waste heat, you can capture that and make steam and run a steam turbine; a very efficient process.

We also considered combining heat and power where instead of taking that steam and running another steam turbine, we're taking that steam and using it for factories and other, uh, heat rejection, uh, in terms of being able to help, help those, uh, industries avoid having to burn fossil fuels themselves.

We grouped all these different costs and benefit impacts into various categories, called them stakeholders, because we wanted to evaluate, but not only the total SROI, but we want to look at it based upon what's the impact to the community. What's the impact to the environment? What's the impact to the economy? What's the impact to the utility? We want to understand all of that. When you look at the BPW's account, you're looking at the things, what's the cost to build it? What's the cost to operate it, okay, under different scenarios?

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But the electricity user account is interested in, "What's my cost of electricity gonna be? If I have a district heating option, how much am I going to save with that district heating?" The environmental account is considering, not just greenhouse gas emissions in terms of what it might be on-on a cap-and-trade system, okay, uh, but in term... in terms of criteria of air contaminants, we also evaluate the social impact of that, social impact of greenhouse gas, the social impact of criteria air contaminants. But if we have district heating, there's also some quantification of the savings that you do because you're not wearing out your gas and boilers and the furnaces, uh, associated with that and that's also accounted for.

We look at economic activity account. If the cost of electricity is lower, studies show there's a propensity for businesses relocate in those areas. So for the, for the case of where there are some lower rates; in other cases, there are some business relocation benefit, uh, ascribed to that. If we get into burning wood in the community, a couple of scenarios either looked at circulating fluidized-bed, or [inaudible 00:14:52] one of the units at the De Young Plant, there's a benefit potentially economically to developing the wood industry in the area where they're processing the wood and shipping it for fuel purposes. That's accounted

for. The community account, they look at things like, you know, for example, loss of commercial harbor status. Uh, [and right now], we get a lot of our shipments in via of coal, via, uh, vessel.

Certainly, if we continue to invest in that and increase that quantity, the potential for the federal government to find that the in—the shoal—shore removal and the Inner Harbor dredging is there. But if the plant will be retired and repurposed for something else, there's a social value of parkland or some other use for that site. That was considered. Snowmelt service cost has to be taken into consideration as well. We talked about the fact that Unit Number Three provides that, that energy source for snowmelt. So if we don't build any new generation which is two of the scenarios we looked at, Scenario E and Scenario F, we have to find a heat source for that snowmelt somewhere and those operating cost were taken into consideration in those scenarios.

00:16:00 Again, we try to quantify the entire impact; we looked at all those things. And where is the high level takeaway here? The high level outcome, really, is that the three scenarios, three scenarios with the highest Sustainable Return on Investment Anal— uh, result, Scenarios A, B, and G, had natural gas as the base fuel, the base resource. The largest benefit is reduced emissions both locally and to the extent that there are generation that is above what our internal needs are displacing older fire, older potentially coal fire, uh, less control generators in the whole [inaudible 00:16:47]. So overall, there's a large, large benefit is reduced emissions.

Electricity cost savings were significant as well. Two individual impacts dominate the overall results and that's the value of electricity service and the value of emission reductions. Scenario G had the greatest financial return on investment and greatest sustainable return on investment as well with the range of the sustainable return on investment again, relative to the base case, \$300 to \$800 million over 25 years better than the base case. The range there is dependent upon the fact that there is a low, medium, and high natural gas price projection again. Price sensitivity on natural gas was taken in consideration. Scenario G reduces both electricity cost and emissions, increases Holland's competitiveness and provides district heating and snowmelt benefits.

00:18:00 Frankly, all these, all these scenarios whether it's, uh, natural gas, uh, generation and combined cycle form have that opportunity. On the macro-level, district heating shows potential for significant cost savings. The devil is in the detail on there. How much you deploy that, how much there is a demand for is gonna drive the cost effectiveness of that investment. But Scenarios E and F were both the worst performing from a financial standpoint and a sustainable standpoint which means that they're the ones that relied upon the external market for new

power generation. So opening and operating electric generation is in the best interest of the city both from a sustainable standpoint and a financial standpoint.

Investing in the controls of the De Young Plant, we looked at cases where it was retired, cases where we made that investment. Really, in terms of the price electricity, there was very little difference between the two which means that if you invest in those controls, in three, four years later, there's additional regulations that are— you're going to be facing, that's a risk. So right now, it doesn't appear that there is an overwhelming driver for investing in the controls at the De Young Coal Plants. It may not be economic to do that.

Another key point is that the location of new generation is not necessary to be on the waterfront. Matter of fact, that site isn't really that great for constructing things. Um, it was built out of... it's [fill] material there so even the, the current plan is built on some pretty significant pilots. Uh, there's new regulations that are coming out that made the requirement for new generation to have cooling towers associated with this. So since you're only going to be supplementing the water, not, not happen to flow through multiple millions of gallons a day of-of water for cooling, of new water for cooling, the location isn't necessary that it's on the waterfront.

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Again, this bar shows the relative financial, sustainable and total including sustainable return on investments. And A, B, and G stand apart when you look at the mean results. And also when you look at the probabilistic outcome on the S-curves, they also stand far apart from the other group in here. Again, that's A, B, and G. From the cost of electricity perspective, again, emission reductions and the value to that was a big driver, the cost for electricity was a big driver. Scenario G, above 82 ½ dollars in megawatt hour is very close to where we are today. These are in 2012 numbers. It implies that over the next 25 years, you will have inflation or increases in the price of electricity, but otherwise, the price is fairly consistent with where we're at today. Scenario A and B are not that much different from that, above 5 percent or so.

Now, there's been some concern about the amount of natural gas built, especially as it relates to Scenario G. Now, we want to point out some things and maybe it's not in, uh, inherently obvious to those who are reading the report and reading the, uh, reading what's being presented to date. The combined cycle, if you look at each of the generation scenarios, there's multiple resources being deployed in each of those. Not just combined cycle technology, but also combined heat and power technology is also used. Those are both natural gas fire generators, okay. So when you look at all those scenarios, Scenarios A and B at a smaller combined cycle unit but has 30 megawatt combined heat and power unit, so in total, the total gas capacity added under Scenario A and B is a 108 megawatts.

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In Scenario G, it's a 114 megawatts. Only six megawatts different. The cost for the combined cycle under Scenarios A and B is a \$147 million. For the combined heat and power unit, \$60 million for a total investment of \$207 million. Whereas the larger combined cycle unit has a cost of \$182 million. So all three scenarios are investing about the same amount in natural gas. But Scenario G cost about \$25 million less in capital and has a higher thermal efficiency for electric generation.

So the questions is, "Well, you know, if you build Scenario G, you can't invest in renewable." Not true. \$25 million more in Scenario B and it has the prospect of building all these renewable. So there's nothing here that implies that you can't build renewable or build other things that are in portfolio just because you invest in Scenario G. There's also concern about the over building, building way too much. Well, we look at all the scenarios, again Scenario A at 78 megawatts of ser— combined cycle, 30 megawatts combined heat and power, no renewables, a total of 108. It implies there has within it the retirement of the De Young Plant, so you're taking out 60, that means new generation, 48 megawatts.

Scenario B, 78 plus 30 plus 22 biomass, 20 megawatts of wind, 4 megawatts of bio-digester, or 8 megawatts of solar for a 162 megawatts. Take out the 60 of De young, it's a 102 megawatts in that. Scenario G, 114 minus the 60, 54 in that. There's nothing significant about Scenario G relative to A and B. Scenario G is a replacement of a smaller combined cycle and a combined heat and power unit with a larger combined cycle unit.

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To test the economy scale of building a larger combined cycle unit, we've heard that BPW does not have a commitment to energy efficiency. To that I say, since 2009, Anne Saliers, her predecessor had been running through the BPW a energy optimization program with residents and businesses in our community. We received from our customers, every year, an amount of less than what we've made investments, okay. So we have a revenue line of [inaudible 00:24:31/title] on your bill if you're a BPW customer for investing in energy optimization. We are investing in those controls more than what we received over the three-year period of 2009 to 2011, 23.4 percent more than what we received, \$382,000. We've invested really, to date, with the budget of this year will be at just under \$3.5 million in controls and homes and in businesses to make them more efficient.

And what have we done? Those programs and investments have saved 2 million kilowatt hours, 14 percent more than what Public Act 295 mandates. We are beyond the requirements of the program and we're doing it very cost-effectively. We're very excited about it. We continue to invest in it. We're very excited about the new programs that we're offering. Every year, we're adding programs to the

list both from a business and from a residential standpoint. The fact is we don't take energy efficiency lightly. We're putting our money into it and it's right here.

00:26:00 BPW doesn't have a commitment to renewable energy? No, that's not true. Matter of fact, we have 20-year contracts with numerous landfills within this lower peninsula. We have a long-term biomass generation contract. Our current arrangements meet or exceed Public 2— 295, Public Act 295, Renewable Energy Law through 2018. We have spent hundreds of thousands of dollars on two wind developments. Unfortunately, they didn't work out, but each one of those investments would have been about 5— would have been [north] of \$15 million. The wind [wasn't great]. But we are in negotiations regarding two purchased power agreements with wind developers, one to 10-year agreement, another one in 20-year agreement. Potential for up to 15 megawatts in each contract which if we incorporate that into our portfolio would exceed our requirements for Public Act 295 well beyond 2030.

We did a prune approach in making sure that this was the right investment. And what we're saying, and now we have a contract at hand, well, I'll tell you, we've been in long hard negotiations on this, close to having it here, is that this in— this is the right decision when you look at the investments that we're going to make in new generation, in the district heating, and other things in our community, a purchase power agreement from a developer is the least risk approach and the least cost approach and reduce [inaudible 00:27:37] for us to go through that process and make sure that we have the right investment.

00:28:00 I know I need to answer every question that there has been and we have a lot that Ted is gonna start with but I wanted to give a little bit of an overview on the sustainable return on investment process and at least try to make it address some of the big questions or recurring questions, you know, that we've been seeing. So with that, I'm going to, if you want to fill in a card...

Speaker 1: This is just a... I'm wondering if that's available.

Dave: I can make that available, yes.

Speaker 1: [Inaudible 00:28:13]

Dave: Okay. Good. We can make that available. With that, I'm going to turn over to Ted and have him start with the, uh, grouping of questions.

Ted: Good evening. Uh, I'm going to start with the question from Susan Harley from East Lansing. I think this is a good question just to get out this out there right now is if you did not answer all the questions received during tonight's event,

will you answer them in writing on the website? And then additionally, will you also provide written answers to all the questions.

Dave: Yes, we are taping the event tonight and it's been our process to get a transcription of each of those events and we will do that. Um, we hope to answer all questions tonight, but we do know that that's a pretty tough task to try to get through all that dialogue that we will, uh, we'll work at that. But if we are unable to, yes, we will... we are committed to putting all that and making that available in our P21 website.

Ted: Okay. The f— the first question is again from Susan. Um, what energy demand forecast did you use for your SOR— SROI report? How much energy efficiency was ex— was examined under that forecast and why did you not treat energy efficiency as a generation resource?

Dave: If you look at the, uh, the, the demand forecast, what we did is we had just, uh, previously gone through an actual load forecast study and when you do a load forecast study, you look at an econometric model, okay. It's a very complex process to do that. We had Black & Veatch in to do that assessment. They looked at residential growth. They looked at business growth based upon, uh, uh, such factors as population projections and, and also state, uh, gross domestic product, uh, projections, uh, and that drive really are forecast from the various groups. That was done in 2009. There was also, as part of that base forecast, there was a report that was done by the Electric Power Research Institute (EPRI) that looked at their assumptions on what they believe to be a reasonable potential for demand-side management and impact on the energy efficiency, or energy efficiency on, on future electric, uh, energy and demand reductions.

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We took the reasonable, uh, assumption associated with that forecast which accumulatively, uh, through 2030 was around 8 percent, uh, and that is the, the amount that are base forecast was reduced. Now, keeping in mind that 82 percent of our, uh, customer base is commercial-industrial, we've also looked at the Energy Information Administration and the fact that they are looking at the change in gross domestic product on a natural basis versus the percent change in the electric sales is declined meaning that we are getting more efficient at what we do in a manufacturing environment. And our economy is changing from an industrial manufacturing to more of a service-based economy.

So we looked at the trend associated with that and we changed over time in our industrial forecast and modify the impact on industrial growth by the gross state of the sales product and say, "Okay, we're going to be continuing to be more efficient as industrial base over time." All those factors went into the base forecast and then the demand-side management was brought off. Then, what

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we did is we looked at the fact that since 2009 ad 2011, we hadn't seen a growth in the industrial sector that we have projected to see, for some of the new, uh, plants that have come in, and so we adjusted our demand forecast with the Ventyx model for this Sustainable Return on Investment model by that initial amount. Now, whether you call that all energy efficiency or just an overall reduction, it goes to further to reduce that amount. But if in terms of addressing efficiency directly, I would say the 8 percent from the demand-side management, uh, work in the EPRI, and I would say the fact that we did the energy intensity projection, Black & Veatch had said that it's the first time that community or, uh, investment utility had factored that into the industrial growth projections that they, that they recall, uh, are two things that have gone to sort of shape the future demand and expectations for the BPW.

Ted:

Here's another one from Susan. Uh, why, when the [fourth] chairman had said base load is a thing in the past, are you not looking at distributed renewable generation? Moreover, distributed to renewables with battery energy storage with products made by LG [Camera] Johnson Controls?

Dave:

Well, there's two parts to that. One, uh, the Chairman Wellinghoff was talking about base load generation, he was referring to nuclear and, and coal-fire generation. As you look at our results here, it's purely, purely pointing to, uh, a natural gas combined cycle which, well, that's a base... it can be used as a base load generator resource. The reality is we can also just pass down 12, 16 hour, uh, bases per day. It's, it's, it's what's— turning the electric industry more of an intermediate. It's dispatchable. You can use as a base resource but it also can be used as intermediate resource. Number one. Two is relates to wind or other renewables as I point out on the slides that are there before. We are well beyond the Public Act 295 and we're looking at wind, uh, as part of that future portfolio as well.

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Now, uh, storage technology is something that's being developed and maybe I need to turn this over, I don't know Jim, if, if you want to add any comments, but in terms of energy storage, where that sits at this point in terms of it being commercially viable, I'd be turn to you.

Dan:

Woah, gotta be smarter than what you [can].

Dave:

Just push this one.

Dan:

Thank you.

Jim:

Certainly. Hello.

Dave:

[Inaudible 00:34:24] Try it now.

Jim: Testing.

Dave: Maybe not.

Jim: I guess I will just add in terms of energy storage technology. Certainly, that's a key driver to make some of these intermittent renewables, uh, more viable. Um, in terms of the currently available energy storage technology, uh, it's a probably the leading energy storage technology is pumped storage much like at Ludington. Well-proven, it's been around for quite some time. There are some emerging technologies, both flywheel storage and battery storage, but, you know, those are not quite what they need to be. And at this scale, they need to be, to be economically viable at this juncture. I have to say in the future, there won't be technological advancements that make them viable, but as we sit here today, basically, the economics and cost and scale of some of these other technologies are still emerging.

Ted: Uh, here is another one from Susan. Uh, [inaudible 00:35:27] analyzing expanding and proving your existing natural gas capacity, um, at 48th Street site, not at the De Young site.

Dave: Uh, well again, we're looking at offsite as a potential but in terms of the generation choice, it's a new resource and it really is for... the main reason is the units that we built at 48th Street are what we call industrial frame machines, okay. They are ones that are intended to start and stop everyday. They are peaking units. They, they serve that heat demand, but, uh, essentially every time you start it and stop it, it counts towards a major maintenance interval, okay. So you have to do multi-million dollar jobs very frequently when you use that on a daily basis.

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The type of machines we're looking at either what are called an LM2500 and LM6000. It's an aeroderivative machine. That means it's a kind of same exact engine that sits under a wing of an aircraft and it's designed to start and stop everyday, multiple times a day if you need it too. There is no penalty for starting and stopping those types of machines. So they are better suited for an intermediate type of combined cycle operation where you're going to, let's say start it everyday, turn it off after the peak period, and start it back up the next day again. And so that's the primary reason that we're looking at, um, a different technology choice plus there's been advancements. All those units at, at 48th Street have been— were put in in 1992 and year 2000. The advancements that in terms of energy efficiency in the new, uh, combustion turbines, uh, is tremendous. I mean even the... on a simple cycle basis without combined cycle, I think we have probably... what kind of an improvement would you say there is, uh, done over the last 20 years, uh, Jim? Do we have a relative...?

Jim: I, I don't have a number off the top of my head, but I would say that the, the energy efficiency of the combustion turbines themselves going from the frame units to the aeroderivative is significant improvement. The other thing to, to point out is the existing combustion turbines in the HBPW, um, generations that, um, are quite dated and not only do have less efficiency, but they have a much higher emissions profile than some of the new machines. So if a new machines are much, much more efficient particularly in combined cycle and produce much less in terms of, uh, air emissions.

Ted:
00:38:00 I'll do one last one from Susan here and, um, what additional SROI scenarios do you plan to run to study? What mix of efficiency, renewables, and other sources are best suited for Holland's realistic energy needs?

Dave: Well, actually, one of the nice things about running the different scenarios that we did is that it either tells us explicitly or implicitly, you know, what we might be able to expect from different combination of the things. For example, we have some— we have cases where, uh, the De Young plant is retired and somewhere it's not. So we know implicitly between those two cases, what's the result in terms of emissions profiles, what's the result in terms of cost of electricity. There's a lot of things we can do from that. We also have scenarios between, for example, Scenario A and B where we've run cases where there have been renewables in the mix, and cases where they're not. And we see the relative impact from a cost perspective and, uh, from emissions.

So, for example, let me go back to the slide right here. The difference in terms of Scenario A and B is that Scenario A didn't have renewables; Scenario B has renewable. So you could see that over the life cycle, you know, had a fairly low, about \$2 per megawatt hour, uh, change in, uh, price of electricity. So again, you know, you can take Scenario G and say, "Well, with some renewables on top of that, we expect maybe a little bit higher cost there for profile, but Scenario A and B shows me somewhat a level of constraint maybe around that that I'll be able to expect. So I don't think there's a necessarily need to run additional scenarios unless, uh, you know, our board and our council say, "You know what, we're looking at this but we want to know exactly what the impact is gonna be so let's rerun some things." You know, we think we have a lot of information at this point to be able to understand relative one to another, what different, what different setups, uh, in the various appointment might mean.

Ted:
00:40:00 This question is from Timothy Dykstra from Holland. The heat district keeps coming up as one of the reasons to expand or rebuild the De Young plant. Please, explain what this district is, why it must rely on the De Young for this heat, and what other more effective options for this apparent necessity are being considered or should be considered.

Jim: Yeah, absolutely.

Dave: Well, I think the district that is really being talked about here for... first and foremost is our existing district that that's the snowmelt system, okay. Our snowmelt system, um, for those of you who had been in downtown Holland, the principal shopping district 8th street, some of the connecting sidewalks going north and south is all heated using waste heat from De Young Unit Number Three. And, and so there is a need to continue to run that using waste heat. If you run it using, uh, uh, a package boiler, I think the, the impact, going back to the probably over the board over here.

But, um, you look at Scenario E and F, for example, they're the ones that retired the De Young units. Uh, Scenario E and F say that your, your snowmelt will cost, uh, the 50 percent, uh, projection, is about, uh, let's say 7... \$7 million... I'm sorry, Scenario F is over here, this will be immediate retire. It's about 20 million power impact on a 25-year basis. So little less than a million dollars a year that we have to be born by the, uh, the community, um, you know, the [Christmas] shopping district and, uh, there's a... there's special assessment district that this operating and cost for the different infrastructure that's there, uh, you would have to face. So, you know, we'd like to address that and so you have to be close enough to be able to send that waste heat to that district, that's gonna be right at the same site, okay.

00:42:00 That's why we say, uh, options of... maybe not at De Young, that's because we could find areas that are close enough to that site and still integrate with it and, and not have to be right on the same footprint. So, uh, that's the district. The other district that you're looking at, really a district heating opportunity, and that's also within the Community Energy Plan as one of the, uh, strategies associated with helping reduce our greenhouse gas impact from a community perspective. And next, you're looking at one of the major users, and obviously, you know, you may have the Hope College campus, uh, perhaps, or other large buildings in town that are using natural gas in firing broilers, they'll be able to shut off those broilers and use more of that, uh, more efficient waste heat product from the generation that, that you will be able to deploy.

And again, you want to be close enough to it that you're able to integrate, uh, without a lot of energy addition to have to, uh, to get it to the, get it to the site. So that's where the proximity enters into, uh, the equation. But I think mostly we're talking about there is the existing, uh, snowmelt system and making sure that that continues to operate well.

Ted: I'll do another one from Timothy. Wouldn't it be much more financially effective to eliminate the De Young Plant altogether and negotiate better rate with those

who currently provide 84 percent of our power and elibon— eliminate the extravagant cost of construction, regulation, maintenance, and a likely tax or rate increase to pay for such an investment? Or simply allow consumer's energy to provide the power and bill the users directly, thus reducing cost of city— city services significantly.

Dave: Well, let me take that in reverse order. Um, you know, consumer energy currently offers electric services in the surrounding townships, uh, to Holland just so we have that opportunity, and when we looked at the cost comparison on the residential level, our rates in those areas are 21 percent lower than consumer's energy and, and, you know, partly that's, uh, due to, uh, the fact that we base improvement investments and generation. You know, owning an operating generations and then paying that off over time helps keep our... helps keep our rates low.

00:44:00

And so, you know, I think in taking that in reverse order, I don't think that our rate payers, uh, would benefit from having an investment utility come in and serve them. Now, in terms of getting our power from the outside, I think the number we cited, 82 percent. The reality is we owned generation outside at Holland. We import it, but we own it, own part of the Belle River facility over in St. Clair, Michigan. We own part of the J.H. Campbell Facility at the Port Sheldon. So even though, we're bringing that power in from across the grid, we own it which gives us some control over the cost associated with that as well.

We don't want to see E and F, Scenarios E and F, where we rely more and more on the wholesale market going forward. They have the worst financial and the worst sustainable return on investment. So our belief is that, uh, that would not be both from either turning it over to the investment utility or from continuing to rely more and more on the external market. Uh, not a good stable, um, uh, result.

Speaker 1: [Inaudible 00:45:05]

Ted: If you want to ask a question...

Dave: Put the, put the card and we'll...

Speaker 1: It's [inaudible 00:45:10] to what you just said though.

Ted: I have a question here from Trevor Baker from Holland who is here tonight. Um, you refer to studies that indicate lower cost of energy associated with higher propensity of businesses to relocate. What are the citations of these studies? What data is used to make this inference? And why do you believe this would be decisive for businesses to relocate to West Michigan?

Dave: Dennis, we're going to have to kick that one to you. I don't know whether you picked that one there or not.

Dennis: Yeah. I didn't hear the question.

Dave: Okay. I'm going to repeat that. I think there was a... was referred to here is that there is a citation study or area and inference in the study that essentially there's a business relocation benefit, uh, associated with lower cost of energy and associated with a higher propensity of businesses to relocate. What are the citations of these studies and what data is used to make it this, uh, inference? And why do you believe this would be a decisive for business to relocate to West Michigan?

00:46:00

Dennis: There is literature out there and, uh, I can provide the citation, I guess, separately maybe. Uh, I don't have it in front of me. Um, but looked at businesses looking to relocate to different areas and utility rates frank— frankly were one of the criteria that really made them, uh, um, influence their relocation decision amongst other things. And, uh, what we did essentially was looked at, um, essentially new enterprises throughout the state of Michigan on an annual basis using, um, census information, and the average size of business, um, the size of Holland, average salaries, etcetera, and using those relationships from that study, um, derives an estimate, obviously with the [rich] range around it that lower utility rates would potentially over a life cycle of some 25 years bring benefits to the community.

Um, you know, I can provide the citations separately. I would say that, um, you know, this is consistent with what we see in the literature but I would note that, you know, in relative terms, the overall magnitude of the benefit was while significant, in some cases, it may have been in the range of, uh, 10 percent of total benefits, but it, you know, the impact was, um, to some extent lost by some of the other impacts. But, um, I guess Dave, the best thing that I would indicate is that I could give the citation separately by email, if that's okay, to put on your website.

Dave: Yeah. I think a follow-up with that would be appropriate. I think some of the magnitudes, I looked... just looked over there at Scenario G, for example, relative to base case, like the mean was about \$60 million for business relocation...

Dennis: That's right.

Dave: ... benefit. Some of the other cases are \$20 to \$40 million, so it just depends on, you know, where, where that lines up in terms of the cost of electricity with, uh, uh, with the base case. Okay. Thank you, Dennis.

00:48:00

Ted: This question is from Sylvia Avsharian from Holland. Uh, where is Garforth Scenario B in the SROI? And what does the SR— ROI scenario G have to do with the Garforth Community Energy Plan?

Dave: Yeah, Scenario B, uh, you know, again, that the Community Energy Plan, uh, Scenario B that we did, uh, is matched up very closely with Scenario B in the Community Energy Plan. Um, the only real difference in Scenario B is the amount of wind. Um, Scenar— Scenario B in the Community Energy Plan called for solar installation starting in 2030 building through 2050, uh, to amount of 24 megawatt. So, of course, our plan goes to 20...20... I'm sorry... 2035. So we get the first 8 megawatt [so that] in our plan. But other than that, we have 20 megawatt, uh, [inaudible 00:49:15] without the 20 megawatts because that's the size of the wind farm we're developing over as a count... uh, over as a township at the time, we're just looking in over as a townships.

00:50:00 And, and so, you know, Scenario B is very much the same as the Scenario B in the Community Energy Plan. As I mentioned in the, uh, uh, it's on my opening remarks, Scenario G really is a comparative of what are those natural gas resources, uh, associated with the, uh... there we go. Thank you. Yeah, okay. Um, if you look at the, uh, Scenario G, as I mentioned, that's a, essentially going from a smaller combined cycle and a 30 megawatt combined heat and power instead of looking at a 114 megawatt combined cycle unit. Both can reject heat, both for, uh, the snowmelt purposes and district heating. The issue is the economy of scale associated with one... operating efficiency of one versus the other. So they're very much similar type of, uh, scenarios. And, um, and Scenario B is, is from that.

Now, when you're doing power supply planning, why do we do G, E, and F, for example? Well, G, I explained a little bit about. E and F, why do you do E and F? Well, we serve the entire city and surrounding townships. We have to know what relative impact is going to be from a cost of electricity standpoint, one option versus the other from the electricity standpoint because we have to make sure that we're doing a different resource appointment for say a district heating solution within the city of Holland, that those decisions are not negatively impacting the rates to the surrounding townships. And so E and F give us this sort of holistic look at, "Well, what if we didn't build anything new?" and said, "Okay, we didn't really rely on the wholesale market."

So, you know, we're going... we're doing some scenarios beyond the Community Energy Plan and the reason is that's important in the power supply and power supply point of process to make sure we understand the totality of those different, different areas. But, you know, hopefully I answered the question

there in terms of B versus G and effective and in fact, the B lines up with the, uh, Community Energy Plan B.

Ted: This question is from the audience. Uh, consumer's energy pays taxes to support Michigan schools. How do your rates compare in pre-tax dollars?

Dave: In pre-tax dollars... I don't know the rate that consumer's energy pays. You know, I have to probably research to look at, uh, you know, that impact, but I think from the competitive standpoints, uh, we're still far beyond, uh, that. But
00:52:00 the issue is in... with the municipal utility, the rates that are... residents are, are... customers pay go directly to either pay for the services they're receiving today or the services they're receiving tomorrow, okay. The important way for reserves, for future reinvestment in that infrastructure, or for the direct operating cost that they're seeing today. There is not a profit margin that's going to, uh, uh, a stockholder somewhere, uh, outside.

And so, you know, that's the real driver in terms of a municipal energy and the benefit provided to a community is that our customers essentially are the ones that are going to benefit from every dollar, uh, that is received, um, from our, from our services. So, yeah, I don't have this specific, uh, number, but I think, you know when you look at the 21 percent advantage there, uh, you know, I am very comfortable that even pre-tax kind of situation, we have a significant advantage over consumers or any other investment in utility.

Ted: This question is from Rock Collingsworth, and he's from Holland. Uh, I'm glad that the B... BPW appears to be open to citizen input, but I'm not convinced that they are listening. Have they digested the contents from September 4th and 5th? What effect will the citizen input have?

Dave: Will affect, well, again, we are taking all this. We are answering questions to help people understand the content of the report. Um, we are interested in comments. We've had it, uh, both from a written and, and, uh, in verbal comment sessions. Comments can still be submitted. Um, all of that is going to be put together in the public record associated with this. Um, our board and our
00:54:00 council are the ultimate decision makers in this process and so we'll consider all of the data from this analysis.

We'll consider the public input to the process and, and they will, uh, use that to formulate, um, their direction on where we're going. Staff is going to also consider all of these and in terms of making recommendations, but ultimately the board and the council will sit in, uh, judgments of those recommendations and decide, you know, whether those recommendations will be taken up.

Ted: You touched on this a little, but he has a follow-up question. What else would the city use to make a decision other than, other than our recommendation?

Dave: Uh, hopefully I... maybe I captured all that in the, uh... you know, this is a risk assessment. So we're looking at the results of this and, and if the probabilistic outcomes give the, the policy makers, the Board and council the ability to look at the range of, of, of potential outcomes and, uh, certainly the input from the community will also be, uh, taken into consideration. Um, from the entire community, you know, residential and business, uh, community.

Ted: This question is from David Marckini. I see that you say in your answer to question two that the study favors Option G, but our plan there still include the development of renewable resources. Then in your answer to Question 13, you say the decision on how much generation capacity has not yet been made, but go on to say another option could still be selected, but the objective analysis favors Scenario G. That sounds very much like talking out of both sides of your mouth. How can you say that the decision has not been made and still talk about G as a favored or preferred option?

00:56:00

Dave: Uh, favored option is essentially, you know, what's being said here is if you look at this curve, okay. You look at, uh, this cost, and you look at that bar, but the report indicates that is the highest SROI, FROI. How can I say it, it hasn't been decided? Well, because it hasn't been decided. Uh, Board and Council haven't voted on a set of recommendations from staff. Staff hasn't presented those recommendations yet. So, um, you know, the report is saying this. All these factors have to be weighed in, in the decision.

Ted: This question is from Carol [McGian] [ph]. Will BPW include members of the community on the electric generation task force and steering committee? And will these meetings be open to the public with public notice and meeting minutes available to the public?

Dave: We do have members of the public on the task force. The task force is essentially the, the risk assessment process panel that was put in place last, uh, uh, last September. Um, this is a process that's been now ongoing for sometime. It's ahead of some of the other things that have been kicked off from the Community Energy Plan, but again, as I mentioned, we had a cross section of constituency from throughout the community. Um, educations, special interest, government, uh, business, uh, all at the table, um, looking at the different, uh, uh, problem... the structure of the problem, the risk to go at... that go into the problem.

00:58:00 And when we've made presentations to the public or presentations at group, they've all been in, in, uh, public. The risk assessment panel met in, met in public for two, uh, day long sessions. Anything that we do in terms of a future interaction with the RAP panel will be in, in a public setting. We're looking at a, uh, I guess the date is, is, fairly firm at this point. We're looking at a capstone event. Uh, we've got to make sure we have enough participation here.

But tentatively anyway, it's not, not completely firm, but October 29 is a date that we're looking at to, uh, bring the group back together and part of that process would be to, uh, review recommendations from staff. Uh, we would be developing some, uh, consensus building questions around those recommendation to try to see what we could get in terms of consensus, um, around that. And that would be a public, uh, study as well. So everything that we have done, everything that we will do in terms of meeting with that that risk panel, um, and... which essentially is the task force associated with that, uh, group, um, will be public.

Ted: This question is from Jan O'Connell from Grand Rapids representing the Sierra Club members who live in Holland. Why is the electric generation decision working on a totally independent and separate track from the Community Energy Plan as well as the implementation task forces just kicked off?

Dave: Well, I think, just to answer that a little bit, um, this is a process in our P21 process that we began over a year ago. And again, reiterating that it was a long process to get to this point. It's a process that we, you know, looked at all the different factors associated with the, the generation options and, you know, it is, it is ahead of some of the other things that are going on in terms of kicking off but not in terms of with the concept, you know. The Community Energy Plan, if you look at the things they are tested, they're the same strategies essentially that were within the Community Energy Plan. So here's consistency and alignment with the community plan and the SROI process. They're not independent report; they're complementary reports to each other. One is the strategy document, the other one is a financial and a sustainable risk assessment for those options.

01:00:00

I don't know if anybody wants to build on that.

Ted: There's another question from Jan. Why is the HBPW obsessed with fossil fuel-based energy and ignoring energy efficiency and renewables?

Dave: You know, that's pretty, uh, uh, loaded question there. Uh, I, I take offense to uh, obsessed with fossil fuels. I mean you look at our generation portfolio today and you look at where we're going with this plan. Uh, it's a far departure, uh, from the two. Number one, if you look... and I, I reiterate the slides I talked

about here. Um, Scenario B, Scenario A, all of them have very similar type of, of, uh, fossil fuel, uh, deployment. We're looking at trying to not only meet a cost project— or a cost target, but we're trying to do things from an energy efficiency standpoint where people are currently burning fossil fuels and building and other places, you need to have heat to do that. You need to have waste heat.

01:02:00 So you need to burn some fossil fuels in terms of electricity production and then use that waste heat, for some of the purposes that you want to offset in, in some of the other areas to improve the overall efficiency of the community. Plus, when you look at our energy efficiency program; you look at our approach to renewable energy. I think it's a far departure from where we are today and where we're headed with this approach. This is a plan that improves environmental and financial sustainable performance of our utility over the next 25 years.

Ted: This question is from Elizabeth Vandenberg from Holland, Michigan. I'm concerned about the undue level of involvement in our community's future power discussion by parties from outside our community who have been very vocal. Since this decision is one our community will have to live with, what assurances can you make that your decision making process is waded to not allow outside voices and undue level influence in this community decision?

Dave: Well, in the process, we each did an... we [each did] an input that, you know, brings thought together, brings ideas into that maybe we haven't, hadn't thought of, okay. Um, but we're very interested in hearing perspective of those that are in the community who are going to be receiving these services from us over the next 25 years. And so, you know, we've gone out to different groups in the community. Um, Riverview Group, Chamber of Commerce, uh, the Mac, the Downtown Development Authority for a number, um, you know. We're looking at and we've reached out to a number of other groups to see if there's interest in having us come in. Uh, we'll be dealing with our, our... or interfacing with our key accounts coming up over the next month.

01:04:00 Uh, because we truly want to go out and make sure that people understand what's being looked at and get input from the entire community, business community, residential community as part of this process. So, um, you know, I think at the end of the day, the amount of public involvement we've had, the amount of interfacing that we're going to be doing, uh, is, is a tremendous level effort. Um, you know, I've been around the electric utility industry for some time, and I think we are going way out there in terms of, uh, the amount of outreach that we've had. So I'm confident that when we bring the results in, uh, and are able to display, you know, what are the feelings, what... how do people feel about the various recommendations; how the people feel about the plan. At the end of the day, we're going to have a good community perspective on that.

Ted: This question is from Larry [Speet]. He's from Holland. Will the plan have adequate money available to invest in renewable energy sources without requiring a special increase in electric bill?

Dave: Well, I think that's a, that's a key, uh, question there. I mean, uh, um, we like to get the renewable energy and not have to pay anymore for it. Um, uh, I think when you look at some of the things that we're doing in terms of due diligence, um, our power supply options, especially as it relates to renewable and not going after the \$56 million wind farm that had, you know, 30 percent capacity factor. Instead, looking at something that has a much higher capacity factor and a lower energy cost. Uh, um, I think that, uh, you know, there's a good potential of at least minimizing that impact, uh, while getting the societal benefits associated with it.

Uh, and, and so what we're considering to is we go down this road and we start looking at, um, putting in this level of renewable is, is offering that up to people who say, "Look, you know, you have 20 percent of your power supply from renewable but, I'd like 50 percent of my bill that comes from renewable; or I like 75 percent." Um, you know that those people that have that interest can step up and say, "I'm going to pay more for that because I want that even though it's a higher cost resource, I want that as part of my bill."

So the nice thing is once we have these resources, we can, you know, and as the process un-unfolds of getting these things on board and we can work with that customer base and, and offer that up, um, as, uh, as something that help [round] out their, their, uh, their resources, their portfolio; what things that they want to have. They can make that personal decision.

Speaker 1: Are you all [on that] now? Just having [inaudible 01:05:57]

Dave: I really... I gotta stick to the questions coming through, everything through here now.

Speaker 1: Just look at [inaudible 01:06:05]

Dave: Yup. Um, the metering that we are going to be putting in place for that, uh, which we have a lot of metering in place will allow us to do more with, with that. But if you want to frame that into question, I can answer that more completely.

Ted: This question is from Rock Collingsworth from Holland. One... while nuclear is not really considered a renewable resource, has a very low carbon footprint and low maintenance. However, Westinghouse and two other firms working with the

DOE is on the verge of marketing a small module... modular reactor in the neighborhood of 200 megawatts. Why was this not addressed?

Dave: Well, let me... just talk to that. Go ahead.

Dan: Hello?

Jim: I think it... There we go.

Dan: First of all... hello, is it working? There we go. It takes a while to boot up, I guess. First of all, those are still emerging... nope mike?

Dave: There you go.

Dan: First of all, most of those technologies are still emerging on licensing and... you need to walk away, Dave.

Dave: All right.

Dan: Lights. That's technology challenged. First of all, most of those are emerging technologies. A lot of them aren't licensed yet. They certainly aren't built and installed. Holland, uh, two years ago, three years ago, did pursue nuclear technology as far as looking at nuclear photovoltaic. So it's a type of technology that... it's a type of technology that was anticipated to be utilized for a [inaudible 01:07:54] Star Wars, when we had the large lasers that we're going to shoot down missiles and you got lasers that size, you have to have a huge amount of power to do it. And so the technology that they were developing down at Sandia, uh, Labs down in New Mexico was a nuclear technology that actually emitted a preponderance of protons and they used a diamond based receptor to convert it to electricity.

01:08:00

But it was the same issue that was good from an R&D standpoint. It wasn't commercially licensed. It wasn't available. It wasn't cost effective. Now, we'll get there. We will get there, but we're not at a point right now where Holland can spend that kind of money on that part of a bleeding cutting edge. It'll happen, but not in the timeframe that we need it to happen.

Ted: Next question is from [inaudible 01:08:55]. If the \$4.6 million that is being transferred this year from the BPW to the city general fund isn't a profit, isn't it a hidden tax?

Dave: No, it's not. Uh, what it is is it's a reinvestment in the community essentially. Uh, I think that if you look at all of our, all of our rate payers, I mean all of them, uh, there is a direct benefit associated with that transfer to the community, uh, and

there's a transfer, uh, that goes from the BPW, uh, to the general city. And that, that money gets reinvested in services that are enjoyed by not only in city, but also the township residents whether they're driving through and happen to have to use the services of the police department or the fire department, you have to be going down to the Fourth of July fireworks at Kollen Park or whatever it might be. Um, the BPW is, is it... it's good for the community to have a BPW to be able to reinvest part of its dollars in that.

01:10:00 Now, let's take a look at that proposition. Uh, BPW takes 5.5 percent of its gross revenues and invest it in the city general fund. That means that for every dollar you pay, 94 percent, 94 ½ percent goes right back into the utility; 5 ½ percent goes into the community in which you rep... recreate or you work, or you use in some way or another. There you find another business proposition that you use as a service that the value you get compared to the amount we spent is that kind of ratio.

Ted: Another one from Mel. How large the gas main diameter and pressure is needed for Scenario G and how far is that main from the James De Young site.

Dave: Now, do you want to grab that?

Jim: Yeah, I'll grab that.

Dave: Okay.

Jim: [Inaudible 01:10:58] Now that they're standing with De Young technology will be, it's hard to... [inaudible 01:11:06] magnetic personality [inaudible 01:11:10].

Dave: There you go.

Jim: I don't know. [It done like] the battery is dead.

Dave: It is dead.

Jim: Not, not knowing what the end technology will be, we can't tell you what the diameter of the pipe will be. Where it'll come from, we can. We have a connection to ANR out in Overisel and had a connection to consumers out in Overisel. Right now, we have a pipeline that runs from Overisel to 48th Street. It's... what's the diameter line, Dave?

Dave: Ten inch.

Jim: Ten inch, okay. Whatever we put in, whether it's a small one or a larger one, we

01:12:00 will need to put in a gas pipeline from Overisel to wherever that site is. That's going to be somewhere around a 10 to 14 mile pipeline. It will be somewhere between another 10 inch or possibly 16 inch diameter pipeline. It would typically come down the same right way that we currently have, at least to 48th Street, and I could say then depending on upon where it's located we'd have to go from there.

Ted: This question is from Dave Marckini. Uh, just curious if you allow people to pay more out for renewables? Consumer's energy does allow us to do so.

Dave: Yeah. And, uh, so, you know, we have our contracts in place for landfill gas and biomass at this point, and they're meeting our requirements under Public Act 295. We're ahead of schedule, but we're only looking at, you know, for example, uh, meeting that obligation through 2018 at this point. So, you know, if you look at socialized across our entire rate base, that that amount is currently within our [tier] rate, okay. Now, there is a renewable energy charge that each customer right now has... is paying, okay. And so that goes to fund those investments to meet the requirements of Public Act 295. They're the... they're the same for every residential customer and then for commercial industrial customers.

01:14:00 Uh, again, there is a kind of a, uh, I don't know, maybe John will be able to help me out on some of these, but there is a range for the various levels of, uh, commercial-industrial size. So that's to meet our obligations at Public A... Public Act 295. We built something or into our portfolio of these wind resources. Now, we're going to have a lot more than is needed under there. So that could be more of a subscription kind of, you know, as you, uh, lot more in your, your own personal portfolio of things that you're consuming, then that becomes the option. We have metering in place to be able to do that kind of thing. We're adding, uh, uh, device on top of the billing solutions associated with that to track that. And so we're going to be in position to be able to do that. And so when we get these resources on board, we'll be able to part... make that part of our, our plan. And we actually identified in our tactical actions that we're doing for this year's strategic plan, a rate, uh, program for renewable energy associated with that.

Ted: Here's another question from David Marckini. Isn't it wasteful to build the proposed natural gas generating capacity and then deviate from it using it when renewables become more available and less costly in comparison to gas which is what I understand to be what you're saying?

Dave: No. I mean, let, let's look at that. If I, if I have a 30 megawatt, uh, total contract for wind, and let's say that wind is going to be produced at 35 to 40 percent of the time. That means on average, I have about 12 megawatt, somewhere shy at 12 megawatts of, of winds on average, okay. And so I don't think you're depl—

you're deviating, uh, from the plan at all. Matter of fact, you know, it's very consistent with not only the Community Energy Plan and in terms of the amount of gas generations, even with the wind being deployed. Um, but these things are complementary, uh, to each other. They each have roles to play. Uh, the natural gas is a dispatchable product. The wind is intermittent. As it comes, you will incorporate it into your annual, uh, consumption of resources. So they, they each have different, different roles to play. So I don't think you're deviating at all from that.

Ted: 01:16:00 This is from Susan Hartley, um, from East Lansing. Why did you not also run a Scenario H that maximize economies of scale of renewable energy and energy efficiency as we're running both kind of scenarios anyway, departing from the CEP. Also, Scenario B of CEP was not representative of maximized renewables and efficiency.

Dave: I'm sorry, what's the last part?

Ted: Departing from the... uh, also, Scenario B of CEP was not representative of maximized renewables and efficiency.

Dave: We'll, I-I think when you look at the amount of, uh, intermittent renewables, Scenario B at 37 megawatts of wind and, uh, 24 megawatts of solar in the Community Energy Plan, um, you know, that's intermittent resources as a percentage of your portfolio. All right, Jim, I don't know, do you have any data out there with respect to as a percentage, when do intermittent resources become a problem. I know I'm putting you on the spot with that, with that question, but that's... [they fixed that].

Jim: I think so. We'll see.

Dave: All right.

Jim: [Inaudible 01:17:06] so I don't touch it.

Dave: All right.

Jim: Yeah. Uh, in general, uh, for like most major industrial utility systems, great systems, they get into challenges when you get the intermittent renewables in the 20 to 25 percent of portfolio range. Again, going forward, a lot of that depends on upon technological advances with storage, okay, and it also depends upon where is your renewable resource. So for example, if it's, um, a hydro facility, you know, one consideration, more seasonal versus a wind or a solar type of intermittent resource, then it's more dynamic.

Dave: So, you know, I think that, again, when you look at the different Scenarios that are there, you can draw again, implicit or explicit, um, uh, findings from, from what's there as well. I mean we have the set— we have set a course with some of the various scenarios that we've ran and we took our cue really from the Community Energy Plan.

01:18:00

Uh, Community Energy Plan was what was, uh, developed as of strategy to try to get our greenhouse gas emission down, uh, to world class level. And, uh, you know, we, we want to take the cue from that, from that plan, so when you look at what's there, we have those represented. And again, there's nothing in Scenario G, as I pointed out with these, with these graphs, you know, both from... in terms of the investment you're making in gas, in terms of the cost of electricity that I would say that you can't layer in renewable energy where it makes sense. And that's why we continue to pursue wind, in terms of adding that to our resource.

Ted: Another one from Susan. If we can study business relocation, why did they not study green job creation benefits of increased investments in renewables?

Dave: Uh, Dennis, that probably is one for you maybe. Um, or back to us if you feel it needs to be. Uh, the question was if business relocation was considered, why not the benefits of green job creation?

Dennis: Um, you know, in doing these studies, it is, um, in terms of looking at employment, um, spinoffs directly to... due to investments. It's not a, uh, a thing that's traditionally done in a SROI or Cost Benefit Analysis study. The reason being on those cases in terms of just looking... I'll give you an example in terms of just looking at the jobs associated with money that's being spent in the community, then whether it's green, um, whether it's renewables or other technology, then what you will find generally is that over the long run, the most inefficient technology will generate the most jobs because it's the most... generally, the most expensive technology and , um, and more costly by default.

01:20:00

So, you know, traditionally, studies, unless an area basically has rampant and raging unemployment levels, you would never consider, um, putting in the employment benefits as such. In the case of business relocation, we are saying there is an incremental benefit to the community of, of potential businesses relocating to the area because essentially the cost of production are lower in the area. It's a totally different thing altogether. So I would just be hesitant in general. Uh, you know a lot of studies, you know, cite job creation benefits associated with, you know, investments in capital here or there.

But I'd be very careful, you know, in looking at those estimates because as I said, you know, what you want at the end of the day for your rate base is essentially

it's providing them with the most cost-effective technology and, you know, the fact that you are spending a lot of money on a technology. Um, and it may in the short term, generate some employment. Um, it doesn't necessarily mean it's a long-term gain for the community.

Jim: Yeah. I-I just, first of all, I'd love the economist, they've been so fun to work with. Um, if I can put this in another perspective, we went around and around during, I think it was the first RAP session about, uh, job creation benefits. And one of the ones that's often cited is how many construction jobs would this project generate versus this project? And at the end of the day, whether it's a green job or whether it's a construction job, with all of these different scenarios have, that was not [stickered] into the SROI 'cause the economist said that's not necessary. Something is done on the cost benefit analysis.

Ted:
01:22:00 This is a question from Greg Holcomb. Uh, what purposes can energy optimization, uh, PA295 funds be used for today?

Dave: I may need to get Anne Saliers up here to actually help me with that. Um, I have this chart here again, I'd like to go through again. Uh, we have new programs every year, uh, to try and keep it fresh. You know, try to continue to find, uh, opportunities in the business and the residential sector to invest in energy optimization. And, and, uh, so when you look at, you know, we are increasing over time both what we receive from customers, but more, uh, what we're... what we're making in terms of investments, uh, in energy efficiency, uh, in our community. So, you know, through the... about 9 mill— or 900,000 more in investments than, than revenue through those first four years the BPW is definitely out there ahead of, uh, the requirements in Public Act 295.

But in terms of particular things that we can invest in, it's things like education. It's things like actual appliance, uh, incentives. Uh, it's things like audits in businesses and residential, uh, areas. Um, I don't know, help me out Anne. What else is there? There's custom programs that, that businesses can get involved in. And, uh, this is in a [prompt] to channel of [spot] here. [Inaudible 01:23:40] on a second. Try it now.

Jim: Try it now.

Anne:
01:24:00 Okay. All right. The, um, energy optimization program is set up where, um, according to Public Act 295, the money that we bring in is to be allocated in the ratio of the make up of the community. So as Dave was mentioning, 82 percent of, um, the, uh, electricity that we sell comes, uh, from commercial and industrial businesses. So you'll see... or not on [inaudible 01:24:20]

Dave: Yeah, we'll have it here.

Anne: But, um, on our programs that we spend a good portion, um, back to businesses. So same with, you know, residential programs. So we're to have programs in each, uh, customer class, um, and also for the income qualified. And that is supposed to reflect the, um, the ratio of income qualifying, uh, customers, um, in our community. And so the programs are designed, um, to, uh, help each of us customers classes achieve energy efficiency gains. And in addition, we are allowed to spend, um, no more than, unfortunately in my opinion, 3 percent of our total energy optimization budget on education. And so I mean I would love to do a whole lot more. So I try to make education into the actual programs in addition to having a separate category that's education.

01:26:00 Um, we also are, um, able to allocate, um, again, it's about 3 percent to pilot programs and this is where we can try some things with emerging technology, um, and [introduce many] things, again, in the residential, um, arena and also the commercial arena. And I am on the lookout for ideas from people, um, about how to best use that, uh, pilot technology so we could do some demonstration projects that people can then learn from and apply to their homes or their businesses.

Dan: Thank you. I can't touch it. It'll break.

Ted: Is Greg Holcomb here? Greg, you have a, a lot of questions were answered earlier. Um, as far as funds and 295 and stuff...

Greg: Will you ask the second question though?

Ted: Yeah. I'm going to. Yup. I just want 'cause those questions down further, if you watch, you can see that. The second question was, if in conjunction with the a new electric generation source, district heating were installed in HBPW service area or is being planned for future installation, what additional energy efficiency purposes could be funded with, uh, [inaudible 01:26:43].

Dave: Yeah. Uh, I think that goes to, uh, some of the stuff here when you look, um, you know, the new programs that, you know, I mean, new for this year. Again, we have these pilot programs. We have, you know, other custom programs that we're looking at getting into. We've done a lot of the lighting stuff. People are getting into like the variable speed drives and other sort of custom sort of applications in the industries. Um, we're doing more with residential audits this year.

And, um, so there's a lot of opportunity, I think with some of those, but they've got to be tied to, you know, electric, uh, savings as well. I mean the other thing that's important to note that is that Public Act 295, uh, applies to both heating

and electric but for us, you know, we are an electric utility. Um, Semco has a similar energy optimization program and restrictions and things that they can do, you know, underneath with the heating area. Um, so, you know, I think there are... there's a growth of opportunity. You know, you look at, you know, what we're doing year after year. And it probably is gonna be the kind of thing we're going to have to continue with anything, uh, because we may have gotten through a lot of the lighting stuff.

01:28:00 So we may have gotten through a lot of that others... maybe intuitively obvious things and we're gonna need to dig a little bit deeper and find out what works and then promote that as continuing opportunities. And that's why education is important as well is that, you know, some of these things that aren't necessarily intuitively obvious, they're going to have to be tried here. Shown to be successful, and then they're going to be an education effort to try to employ that elsewhere. So, you know, what we show here is a growth in that investment. Continue to, or, or we're going to continue to grow that investment and, uh, we've been very successful at.

Ted: This question is from Jan O'Connell with the Sierra Club. He's from Grand Rapids. This summer, the utilities in municipalities in Michigan were invited to attend a CERES report conference held here in the state which covered the risk and set—on certain need of fossil fuel-base generation. Did the HBPW attend and if so, who can be contacted regarding [inaudible 01:28:50]?

Dave: No, I-I, I don't think anybody attended from HBPW. I don't know if HDR did. Uh, I do know that, uh, CERES, uh, um, is some like a, a firm that, or an organization that, uh, is well-known. And so I'm sure that Ventyx who looked at long-term fuel price projections uses that sort of process as an input to looking at assumptions for, you know, on a macro-level, uh, supply and demand.

And so what we relied upon here is more kind of booth on the ground sort of, you know, with the results what Ventyx did, not trying to do the process of formulating our own macro level, uh, uh, supply and demand forecast. I mean we're not in the business of trying to understand what across United States is happening, uh, in electricity. We subscribe to a firm, Ventyx, widely used throughout the electric industry to do that kind of work so that we can take the results of it then and use it in studies like ours apply here, you know, for our purposes.

Ted:
01:30:00 This question is, uh, from Norma Killilea, I think that's... how do you pronounce that? Um, if not, I apologize. Uh, with the movement away from fuels and the possibility that a new generating plan could be built somewhere other than where the De Young Plant is located, what would be the impact on snowmelt and neighborhood heating be if location can be used as elsewhere?

Dave: That's why, I think, when you look at where else, you know, you have to have some consideration of the ability to tie in with that infrastructure. And, and so, you know, the things that we would consider, uh, the locations that we would consider would be ones that would be close to our high-voltage transmission; uh, ability to bring in trucks for, uh, doing large maintenance jobs; um, you know, proximity to the fuel source, the natural gas pipeline; proximity to cooling.

You know, [inaudible 01:30:53] cooling is, load is much diminished with the cooling tower, you know, so there's opportunities there and then interface to district heating and snowmelt. So I mean there are a lot of... there are potential. I won't say a lot. There are potential sites, um, that we would look at as alternatives to De Young and, and, you know, we would consider the ability to continue to heat the snowmelt and continue to, uh, provide the district heating opportunities in our site, site selection process.

Ted: Here's another question from Susan Harley from East Lansing. Why did you not say from the start that the RAP panel would fulfill the role of the electric generation task force and make it clear no new members of the public can join that decision making forum?

Dave: Well, if I wasn't clear, I apologize, but that has been the, uh, the intent of the process all along. They were the fir... they were the group that was involved in creating structure, creating the, the range of, uh, risk associated with that. It's representative of, you know, membership through our, or, groups throughout the community. Uh, if you look at special interest groups, you know, League of Women Voters is represented. Uh, um, the, uh, the Riverview Group is represented. The West Michigan Environmental Action Council is represented. Um, I know I'm missing people.

01:32:00

Dan: Sierra Club.

Dave: Sierra Club has been the part of the process, yup, where they... they were represented at, uh, you know, the second RAP panel process when we went through the, uh, different inputs and the ranges of values associated with it. Um, if you look at the, again, government, we have Hope College. We had, um, Holland schools. Um, if you look at, uh, government, we have the Mac. Uh, we had Lake, um, Chamber of Commerce, and of course, Council and Board Member representation. We looked at business community. We had, uh, some of the key users. We have Lakeshore Advantage. Um, uh...

Ted: Haworth.

Dave: Hey... yeah, Haworth and Herman Miller, uh, were there. Uh, Holland Hospital was there. Uh, so, you know, we have broad representations, uh, throughout the community associated with that, that process. And I made that pretty clear all along now and maybe there has been some miscommunication over the time and I'll, I'll take the responsibility for that. But it has been the intent that that is the group that's involved with, uh, helping the evaluation process along and really is constitutes, I think a pretty robust task force, uh, associated with, uh, wrestling with the, uh, power supply, uh, evaluation process.

Ted: There's another question from [Al Mashkin]. Do you tip— anticipate any follow-up problems like there are from the Zeeland plant? If no, why not?

Dave: I've talked enough. These guys can certainly deal with that one. But I really do love the, uh, possibilities here. So I'll let them...

Jim: Yeah. Great question. It's something that we talked about a lot and considered quite carefully developing the different generation options that we studied. As Dave mentioned, any of the new generation options are gonna require by legislation by law to have a, uh, cooling tower which in many cases has very visible plume. So we made the decision early on, for any of the options that we were studying that had a cooling tower, we would put in what's called the plume-abated tower to help minimize the plumes that come off of the cooling tower. And that's especially important if, you know, the plant is located, you know, with any community because obviously, you don't want to have a plume in a community causing icing on the roads or that kind of thing. So we made the decision to put in a plume-abated tower.

Dan: Additionally, besides rejecting heat through the cooling tower, if you are tied into district heating, you are tied into snowmelt, you also have heat rejection that actually goes to the ground. In other words, you won't have to reject it through a cooling cycle in the cooling tower. Everything so we... we'd love to had it. We reject all of that heat into snowmelt to district heating and you don't waste any of it going up in the air.

Dave: That'll be real fun, uh, actually part of the project.

Dan: Great design. (Laughs)

Dave: Yeah. I think that will be an amazing integration, so.

Ted: Here's another question from Susan Harley. How can you attempt to quantify emission's reduction of natural gas without looking at lifecycle emissions especially for methane, an extremely potent greenhouse gas?

Dave: Well, okay. Uh, I'm going to assume that as methane is talked about there, you're talking about from the extraction process, uh, or some other process than consuming it because on the consumption level, all of the greenhouse gas equivalents were considered on the different scenarios. So for example, if we're burning wood, you know, the nitrogen oxide was considered as part of the greenhouse gas, uh, um. If you look at, uh, VH... yeah... all the different constituents that make up greenhouse gas equivalents were part of that assessment.

01:36:00

So now, you know, let's talk about the, the extraction process. Uh, we made a very, um, deliberate decision during the, uh, RAP panel process among all the RAP participants there to try to define the envelope around which we look at the social impacts, okay? And at the end of the day, and this was with in consultation. I am sure Dennis maybe can weigh on this as well, um, in a little bit is that, uh, when you start looking at the envelope around there and you start drawing it too wide, it gets very difficult to adequately assess all of the different benefits and cost. You start getting out too far and that gets really, really squishy.

01:38:00

So we really made a conscious decision to say, "Look, what were the things that we could impact, that we could impact whether we burn the fuel or we can impact whether it's extracted?" There's going to be a demand for fossil fuels, coal or natural gas, and there's going to be extraction taking place. Two other—two other points: The amount of methane that comes up might not be directly related to the volume of the natural gas we consume or even that's produced on the well. Um, the other thing is shale doesn't make up a 100 percent of the gas that's within the pipelines in the country. So to say that you could try to put some sort of quantification to that, you can't from a societal standpoint without looking at a lot of other factors like what is it if the fuel isn't burned here, where is it going and are there other losses associated with that that you're helping to avoid whether that's coal or whether that's natural gas.

In addition to that, I do wanna say though that our financial analysis looked at if there are problems from an environmental standpoint with methane or with other issues associated with hydraulic fracturing, over time, just as emissions from power plants are addressed, that will be addressed. The assumptions within the fuel price forecast for natural gas look at various levels of regulatory impact. If a well has to be over— it is, is gonna be regulated more than what it is today and therefore there are operational cost associated with dealing with that whether that's retrieval of the water and treatment of the water, or whether that's systems to capture methane and deal with methane.

Whatever that is, those operational costs go to affect the price forecast for the natural gas. And we have three levels of forecast. We tested the range of it and

01:40:00

even in the high natural gas case, there's a \$300 million advantage with G; \$220 or so million, uh, advantage with, uh, B; and just \$120 million advantage with A in that highest of gas price project which at the end of the period time in today's dollars is about \$9 per million cubic feet, 2,000 cubic feet, sorry, for [inaudible 01:39:48] and heating use, a thousand cubic feet. So the decision was around all things societal, the envelope is around the things that we control. And that was a decision that was made across all societal benefits and is based upon work that HDR has done and their decisions economics groups and other SROI analysis.

And I don't know with Dennis. The issue was, you know, why didn't we look at some of the, uh, social impacts of, of, you know, say, uh, hydraulic fracturing, for example. And I don't know if, if you wanna address sort of this envelope around societal issues and other things that, uh, you know, HDR has looked at and other SROIs and why you draw the envelope or you do if you want to weigh in or add anything to that discussion.

Dennis:

You know, it comes down at the end of the day, to some extent, um, you wanna make reasonable assumptions and as well you need to be practical of what's achievable. Um, and so the fundamental assumptions in establishing the boundaries and visions for what we look at, to assume that, you know, essentially, that Holland BPW activities, you know, we're not going to impact the global markets, if you will, and the global amount of extraction of various fuels that, um, various fuels over the project life cycle. And, you know, it's a difficult assessment in terms of looking at it. We looked at what other studies are doing with respect to this, with respect to other power generation entities. And so we took a, you know, a similar attack at trying to address this and we go to this reasonable assumption.

Dave:

But that was made in deliberation with the entire RAP panel. So I mean, that was, that was a question we wrestled with in terms of defining structure and logics to the problem and define the risk variables associated with that, so.

Ted:

01:42:00

This question is from Monica Halsey from Holland. [Inaudible 01:41:55] reports are out including the Rocky Mountain Institute and CERES reports that say now is not the time to invest heavily in new natural gas generation. It is, it is the 18 percent of power uses, Ho-Holland residents that will be stuck living with this plant for decades when I consider a five or ten year plan that commits to the retiring JDY as renewable energy technology continues to advance and drop in price.

Dave:

Well, again, when you look at, uh, Scenarios E and F, those are the no bill, uh, scenarios. And even with supplementing say 30 megawatts of wind and getting 12 megawatts on average, when you look at the electric price impact and the societal impact. The natural gas is displacing what we're currently doing for, for

fossil, uh, generation, doing it much better. And if you look at the, the sulfur, there's essentially no sulfur in gas. Look at the carbon dioxide from an emission standpoint is, is 50 percent.

Jim: Less [nine].

Dave: I'm sorry, less than 50 percent.

Jim: Well, compared to your existing JDY...

Dave: Oh, yeah, because of the efficiency of it. That's right. Even beyond that because the thermal efficiency of one unit versus the other, um, and you look at the nitrogen, uh, uh, oxides, the precursors to ozone formation, much less in a natural gas [inaudible 01:43:15]. Uh, if you look at other metals, something that no metals, uh, a tremendous impact from an, uh, from an environmental standpoint, better than what we're doing right now still providing a dispatchable resource, still providing something that can provide a thermal resource for snowmelt and district heating. And it's supplementing that, when you look at Scenario B and maybe a supplement on G as opposed to B with renewables is a doable thing.

01:44:00 You look at going all with renewables and no other build, well, district heating isn't there. Snowmelt isn't there. A dispatchable resource isn't there. Personally, I would not recommend that, uh, for the community. I think that where we're looking at here is a balanced approach, uh, to resources and that would not be a balanced approach to resources.

Ted: Here's another question from Monica. Uh, a recent Lazard report showed that wind is actually [inaudible 01:44:20] and cheaper than natural gas. Of all these conflicting studies, how can we be sure HDR used the best data available in the HB... HBPW isn't being lured by potential third-parties like the energy authority who are eager to contract with HBPW to purchase, store, sell, and/or distribute natural gas. Is this the business Holland should be in at the resident's expense? Why is HBPW gambling, gambling with rate payer dollars? The energy authority was unable to answer questions on price of utility and upcoming regulations beyond five years.

Dave: Well, I don't think... I don't think that's... we all know in terms of beyond five years is how long the gearboxes and the wind mills are going to last, and a lot of other things associated with wind development, um, you know. So, you know, frankly, to say that we're being lured by third party, uh, in terms of energy authority is preposterous. Frankly, I mean if we... if we're going to buy some natural gas, we might get some management services from them. That's not a big dollar item. Frankly, and if we, uh, we'd end up paying them so I'm not sure

how we're being lured by the prospect of paying a consultant to do something. Um, but beyond that, whether it's gas or then say, we're buying power from a marketplace, uh, because we're not investing in natural gas. We got to buy power from the wholesale market, we'd still use the energy authority for helping to do some of those wholesale power transactions.

01:46:00 So, uh, you know, frankly, again, when there are risk, and there risk in all power supply development. You want to look at the range of probable outcomes. And that's why you don't look at this number here. You look the range of it. Well, the range of it still looks pretty good, okay. I don't know what tomorrow holds. That's why you test a range. Range looks pretty good. The other key is diversify, okay. Well, it's all natural gas. Well, no, it's not. We own part of Belle River. We own part of Campbell. We own some landfill gas. We own a bi— we have a biomass contract. Uh... looking at investing in wind. Uh, you know, it's, it's the first portfolio that's there and I think that's the other factor that you look at when there are uncertainties. But I'm very comfortable given the fact that this probabilistic outcome, uh, was tested, uh that, that, you know, for some level of investment in, in natural gas and frankly that's anywhere within that that range of, uh, stuff we've looked at A, B, and G, uh, and which is 108-116, 114, very tight range, uh, is, is good.

Ted: This question doesn't have a name on it, but I-I-I think it's a...

Sylvia: I'll offer my name. Sylvia [inaudible 01:47:19]. Sorry.

Ted: If HBPW isn't currently getting 80 percent, excuse me... if HBPW is currently getting 87 percent of its power offsite from plants in which they have some degree of ownership and finds that to be economical, why can't the other 13 percent come from wholesale sources instead of JDY?

01:48:00 Dave: Well, the wholesale sources are what's tested under Scenarios E and F. That's a non-ownership situation where you just buy from them. It's like renting your house versus renting something versus owning a house, okay. After a while, you own your house. In a renting situation, you don't. Um, the BPW enjoys a fairly low cost to capital. We can use taxes in financing. We're not, uh, indebted to shareholders that are expecting a return on equity. Uh, and so we can borrow money fairly cheaply. We can build capital fairly cheaply.

It makes sense to own and operate, uh, generation resources. It is economical to do that through partnerships and we bought into small portion of natural gas combined cycle, about 5 megawatts and a combined cycle unit much bigger that was being built in Ohio just last year. The problem is we don't dictate when those get built, okay. We have to be opportunistic when those things happen. We are losing a significant portion potentially of our, of our base load power

supply here in the next three, four years. We have objectives in terms of meeting community targets for greenhouse gases that can only be achieved by investing in our community where we can use the heat. I can't use the heat from [Bell River] over in Saint Claire, Michigan, uh, so I have to, you know, I have a resource here that I can do those things.

Um, beyond that, having stuff here locally, um, helps provide different stability from a grid perspective. Um, you know, in 2003, parts of the Northeast lost power due to a disruption of high-voltage transmission system. The BPW did not. Now, I'm not saying that's because we had our electric generation here, although I think it provided some stability during that situation. But I do know if we had, we have enough generation here to restore our system and fully meet our obligations. In three, four years if we lose De Young, I can't say that anymore. And so we'll become more dependent on that grid, uh, outside. I think it makes sense, again, to do that or it makes sense, geographic diversity makes sense. Uh, large scale ownership among collectively with other municipalities makes sense.

01:50:00 But to achieve our community targets of greenhouse gas reductions and, and the fee to snowmelt system and the fee to potential district heating system, I can't rely upon wholesale. Number one, I wouldn't want to just rely upon on wholesale and rent because that's just giving somebody else a return on their investment and our, our rate payers miss out on opportunity to leverage their cost for capital. But even owning it outside of our system, you know, it's good for some of your portfolio, but put all of your eggs in that basket, you know, I wouldn't, I wouldn't suggest, uh, because I think Holland has benefitted from having local generation resources here.

Ted: Can you clear up a little bit the statement that 80 percent of... we can supply 80 percent of our needs with power from those plants that... the parts of plants we own?

Dave: Yeah, we know we can, but we can't do that. You know, about right now, Belle River and Campbell make up about a third of our... or can supply about a third of our needs. The small little combined cycle unit we bought into is maybe another five or another, I'm sorry, maybe 4 percent, 3 percent of our needs. Um, the remainder of it either has to come from short-term purchases in a rental kind of situation, wholesale purchases or from the stuff that we own. We are taking advantage right now of a wholesale market that is low cost because natural gas prices are also low.

But if you look at the cost of the wholesale market, it's till more costly than what our cost to operate a natural gas plant would be here. Well, because we wouldn't have the willing cost of bringing it across the system, and two, because

01:52:00 we own our natural gas pipeline that interconnects to the interstate, we have other natural advantages that advantage our local generation over the whole sale options. And beyond that, over the long run, again, those entities are going to recover their capital investment and satisfy their shareholders. And so in the long run you pay more by being a renter than an owner.

Ted: I think you had time for at least one more question. This one is from Trevor Baker in Holland. Your overview with slides reference environmental externalities in passing, but throughout the Q&A session, we have come back repeatedly to favor scenarios with the lowest cost of electricity projected. I understand why your large, industrial customers would prefer cheap electricity, but what [inaudible 01:52:32] factor in negative environmental externalities faced by residents and report these adjusted cause.

Dave: Well, again, I reported that Scenario A, B, and G have the best financial and societal return on investment. If you look at Scenario G, the environmental benefit over the base case is about \$300 million. Environmental benefit for Scenario A is about \$220 million, \$225 million. And the Scenario benefit for B is on \$350 million. So frankly, all three of them are kind of within that same area. And they also have the lowest cost of electricity. It just so happens that they're both... they're both that the same. Now, if I took Scenario G, layering in some renewables were smart to do that, that's societal return, maybe \$350 or greater. So there's nothing inconsistent right now in terms of the environmental benefit and the societ... and the financial benefit.

01:54:00 The beauty of it is when I go to this graph, the scenarios with the highest red bar which is the societal for sustainable return, or societal benefits and impacts are also the one with the highest blue bars. Now, I think, I think the business community, residential community, everybody has an interest, um, in-in having a, an efficient system and having a environmentally, uh, beneficial system. And, and the nice thing is in terms of this power supply analysis, the scenarios that are merging from a financial are also... it was they're emerging from a sustainable.

So when I come back and talk about it, it's not inconsistent. It's actually consistent with the environmental side of it as well.

Ted: This question is from Jan O'Connell from Grand Rapids. After two years, the city of Holland has been working on the Community Energy Plan, is HBPW made an effort in establishing a longer range, comprehensive plans similar to an integrated resource plan.

Dave: Well, I think when you look at, for example, 2009, uh, Black & Veatch study that was one done to really look at the load... when you doing the econometric forecast, when you put in energy, uh, energy efficiency into modifying the

demand forecast. And then you start looking at, uh, various supply resources from that. The work was done in 2009 to really do some of the assessment of the load forecast and, and of the, uh, and of the energy efficiency. Um, as I mentioned, we're going beyond those targets. We reduced the forecast, uh, from the, the 2009 forecast.

01:56:00 We've got some, uh, you know, receiving our EO targets. So I think that when you look at where we are, we've done that kind of assessment, okay. We'll do an integrated resource plan generally, you know, every seven to eight years as a process of the utility. It's a normal process to go through. We did one back in 1988. We did one in 1995. We did one in 2002. We did one again in 2007 as part of a collective group at municipals. We followed up with the Black & Veatch study in 2009. And so, you know, four or five years from now, we'll probably start looking at what is the next thing we have to do. Um, you know, you make these investments but you have because the world changes. You have to continually look at that process.

And so, yeah, I think what we did in 2009 is, is, um, you know, it was put to the Public Service Commission and they, they weighted on at us as, as an integrated resource plan. And I, you know, I think it meets what we've done as a normal process every seven years or so. And now, and what we're doing here is sort of building off from the foundation that's there and really taking it to a new level in terms of looking at the different, uh, different scenarios, uh, and what the social and, uh, environmental community impacts of that are.

Ted: We have one here from Bob [Hukshran] [ph], Holland. Uh, with subterranean temperatures throughout Michigan at a 100 to 150 degrees Celsius and with the possibility of building a geothermal plant that generates two gigawatts of power, is building something that generates geothermal energy possible?

Dave: I don't know if I can answer that, Jim.

Jim: Um, could you repeat the question? I wasn't sure if it's 2,000 gigawatt reference.

Ted: Two gigawatt.

01:58:00 Jim: Two gigawatt, 2,000 megawatts. I will say that we did look at using, um, a geothermal type application to support the, uh, snowmelt system. It's one of the options for expanding the snowmelt and incorporating some, uh, perhaps district heating in the downtown area, uh, logging in to the snowmelt system. So surely geothermal is something we considered. Um, quite frankly, a geothermal plant in Michigan, I think would be a significant, uh, economic challenge for it to be viable. The real challenge on geothermal is finding a consistent high temperature

heat source. Um, typically, that's [water], the 300 degree range of a higher and I think the geology of Michigan would be... it'd be quite a challenge.

Ted: Another con— question from Monica Halsey from Holland. Should 25x'25 pass, how do you know what the cause of rocks will be and whether or not it will be more cost-advantageous to build?

Dave: I don't know, but, um, you look at we're looking at for wind deployment, you know, it's meeting the current, uh, set of regulations through, uh, well past 2030. Um, and you know, I think, I don't know whether that will pass, whether it won't pass, but I think that we're considering and trying to get lined up are consistent with it, uh, and effort not only to meet what we see as some response or and being response to what we think is some customer demand.

Uh, but also set to sat well for, if, if that would happen, I think we're in a, you know, pretty good spot, uh, as far as that goes. But, um, you know, I have my own opinions about, uh, the regulations. I don't think that was the potential legislation. I don't think that was the question. So I-I think what we're doing is prudent in terms of planning for both the response of customer demand but also potential inevitability of that should happen.

Ted: This is another question from Rock Collingsworth. Why is the Glen Wind Park canceled and how does that fit in with the Garforth HDR Scenario B?

Dave: 02:00:00 Uh, again, you know, Scenario B was looking at... it wasn't-it wasn't Glen, it was actually, uh, we have done a fairly long look at, uh, some wind potential in Allegan County as a result of the, the Wind Resource Zone board in Michigan, put out study that identify Allegan County as being a good potential on, on shore wind, uh, site. And so what we did, we put up two major logical towers to study, um, wind data. We put up what's called a sodar unit, uh, which actually sends up like a sack, uh, process to test the wind at higher levels so we could correlate that. We brought in internationally recognized firm, [inaudible 02:00:40] to, uh, evaluate the wind data, not only at the wind, at the, uh, in the moderate locations, but also at where we're going to put the wind turbines because there are other things like weight effect.

You know, if you got these turbines line up in array, they can get weight effect. There's top, uh, topographical effects. Um, we did the process of looking at, uh, birds, bats, and migratory impacts and things like that. at the end of the day, the equivalent cost of electricity for that resource because of the capacity factor of the wind and because the capital investment that would be needed for the scale of project that we're dealing with, was not, was not the right decision. It was not the right decision to move forward with it. And looking at what we are close to in terms of getting something put together, I am even more convinced of, of that

today. Um, there are still are issues from a risk perspective and the BPW would have born all the risk from a development standpoint and construction standpoint and from an operational standpoint.

Jim: Intervention.

Dave: Yeah, for intervention? Right, uh, all kinds of potential risk. And so, you know, it was stopped because the data did not support continuing to develop it from a cost and from a risk perspective, simply.
02:02:00

Ted: Dave, it's three minutes after seven. Um, I have a few more unique questions.

Dave: I think we're willing to go, uh, a little while longer if we're close to the, uh, end of the questions here, Ted. Let's see if we can...

Ted: Sure. I have three more questions...

Dave: We can do it.

Ted: ... from people here. Um, from AI [Meshkin], are you considering any sites outside of the city limits for the natural gas... for a natural gas facility?

Dave: Yeah. You know, in terms of site selection, you know, it's a very delicate process. Yeah, and, and so we have not done an exhaustive review at this time, and certainly, I don't think, uh, before we... I have something [ready transactionally] would we even, you know, discuss something like that. So not really having the report on that at this point. First of all, we got to decide with building something and what we're building, so.

Ted: Here's one, another from Trevor Baker from Holland. Today's grasp and projections of the end result, uh, from economic specifications, econometric specifications, where can I read these specifications and understand the specific assumptions that go into each?

Dave: Uh, well, you can go to the, um, Public Service Commission's website. I think it has the case that we put in, uh, for the Black & Veatch study. I don't know if our website still has it on P21 or not in terms of the study in 2009, probably not. Um, but if you want to leave an email address, we can send a link, um, to that, uh, site and the Black & Veatch report is the one that did the load forecast study. But again, like I said, some of our more recent experience, we've lowered that forecast somewhat, so, you know, but in terms of looking at the underlying assumptions that went into the load forecast that was done in 2009, that's all part of the document, uh, that we produced, uh, as part of our air permitting process. So [inaudible 02:04:01] you can still get that is through the Michigan

Department of Environmental Quality's website under our, our, our permit area. But if you want to leave your email address, um, we'd be happy to send a link, uh, to that, to that location.

Ted: The last one I have from, from here tonight, uh, can the BPW purchase power off the grid at a better rate than producing power at this time, today?

Dave: For our James De Young units, yes. But, again, natural gas prices and you look at the cost to generate a heat rate associated with either an LM6000 or an LM2500 has a heat rate of around...

Jim: 7,200.

Dave: 7,200 Btu per kilowatt hour. The current implied heat rate of the market for [inaudible 02:04:54] power is around 10,000 Btu per kilowatt hour. So it means the variable cost is around 30 percent lower, a little on the 30 percent lower for our own generation, uh, compared to the market, uh, cost of wholesale electricity on a gas combined cycle.

So, um, you know, and that, that's to date. And the projections are under Ventyx after some of these retirements put the regulations affecting coal units, that there'll be in the value in the marketplace for capacity as well that if we didn't have a resource, we not only have to pay for the energy but also a capacity, you know, pay for the ability for somebody to produce that electricity and those amounts are close to, uh, what was that number, I want to say, \$100,000 per megawatt per year, okay.

02:06:00 So if we shut down De Young entirely, that's another, um, you know, about four, well, four and five only, but another \$5.5 million when you look at all three of the units, uh, that we would have to, uh, essentially pay somebody else to provide that capacity, uh, to be able to produce that, so.

Jim: It's pretty close to the loan payment. I just wanna... I just wanted to add one thing and try to help clarify. Dave mentioned the system, the market purchases. It really represents about 10,000 Btu per kilowatt hour heat rate.

Dave: Yeah.

Jim: That's roughly a 33 percent efficiency, okay. The combined cycle plants that we're talking about here, um, the LM2500, the LM6000, they're in the 45 to 50 percent efficiency range. So we have a significant improvement in efficiency compared to buying off the grid. It's even a bigger improvement to the efficiency if you compare it with generating power at the existing JDY units because there couldn't quite [inaudible 02:06:48], not nearly as efficient as some of the larger...

Dave: Probably high 20s, right around 30.

Jim: Exactly.

Dan: It doesn't take into account district heat or some level...

Jim: And that's right, it doesn't take into account district heating or snowmelt, and those type of coal generation applications really improve the efficiency more.

Speaker 2: I have a question about some of the [inaudible 02:07:13].

Dave: It's 07:07. All right. There's something else there, Ted?

Ted: Uh, there's one, maybe we didn't [inaudible 02:07:28]. Why did your SROI not analyze green job creation, toxic air pollutant as the value of Lake Macatawa lakefront that include a mixed commercial-recreational options and other values?

Dave: Okay, let's take that one at a time. I guess we talked about the, I'm sorry, go one at a time with them.

Ted: Um, green job creation, we touched on.

Dave: We talked about that.

Ted: Air pollutants we touched on.

Dave: Toxics are part of the, uh, the...

Speaker 2: [inaudible 02:07:55] study.

Dave: I'm sorry, the criteria air contaminants?
02:08:00

Speaker 2: Those are not hazard air [prudent].

Dave: Okay. Well, I'm not going to, uh, go back and forth on this particular item. The studies that were used, uh. Dennis, I don't know if you have this available or not to be able to cite, but when you look at Criteria Air Contaminants, can you talk a little bit about what was, uh, evaluated underneath there?

Dennis: Um, yeah. We did [earlier] a review of, you know, the standardized values, both use by different agencies state in the United States Interagency Working Groups

as well as, um, US DOT for studies. So, you know, we actually looked at a range of these studies and develop the range, it's a library of sources that we used and [inaudible 02:08:45], you know, I can give you a write-up on to come up on with a range per unit of emission [treat] of the CHCs. So I mean it's standardized approach just like we did with, uh, looking at, uh, GHC emissions.

Dave: I guess, you know, firstly, a particular toxic or whatever that you're looking at, if you want to submit that question again, we'll follow up with getting stuff answered in writing. My answer to that was looking at the criteria air contaminants. If that's not satisfactory, well, you know, submit another question in writing and we'll take a look at the particular... again, natural gas, I'm not thinking a particular toxic that you're, that you're, uh, you know, maybe considering in terms of combustion process. And again, remember the envelope around this evaluation want a as the combustion process. I'm not going to go back and forth, but if you want to follow-up in writing, we'd be happy to put a response on the website to that.

Speaker 2: Okay.

Dave: What was the next one, Ted, in terms of that list? Oh, the waterfront?

Ted: The waterfront.

Dave: 02:10:00 The waterfront was evaluated from a, what we consider to be a conservative approach. Um, again, if you go back, here are these, these social value of parkland is really what's talked about there. If you take the site and you would, uh, knock down the plant, uh, you know, remediate the site. There was about, uh, \$11 million in remediation cost?

Jim: Ten.

Dave: Ten million dollars in remediation cost associated with that to prepare the site for a green space, okay. Now, as HDR had said that's the [inaudible 02:10:26] remediate... of remediation. I think that if it were used for some sort of alternative, uh, you know, like a commercial structure of some kind, then you may not have to go to that kind of level. But that was part of the evaluation, and even with that, Scenario G is one that considers that impact. You know, there's cost it and it still emerged as the best social and financial evaluation. So anything that you do that improves that number just goes to add, uh, a benefit to that scenario or to other scenarios that have, um, you know, that-that-that already have taken maybe a worst case scenario or most conservative case of-of looking at it from a social value of parkland, uh, perspective.

Ted: Maybe another one from Susan that we didn't touch on specifically. Why was the large scale wind artificially lowered from the CEP for the SROI study?

Dan: [inaudible 02:11:25] completed, 30 I believe it was in by 2030.

Dave: You have it there?

Dan: Yeah, bear with me.

Dave: I'm not sure that... I'm not sure it came in by 20, uh...

Dan: No.

Dave: ...30 in the Community Energy Plan.

Dan: No. Solar only had five and Scenario B in 20.

Jim: That was 30, dropped to 20.

Dave: 02:12:00 Yeah. Well, you know, again, let's look at the Community Energy Plan. There are timing issues associated with the, uh, the 40 year plan, okay. So I mentioned Solar starts in 2030 and gets rolled in after that. Whereas if you're looking at the deployment here under Appendix 10 of the Community Energy Plan, and really, I can-I can find no wind under Scenario B, uh, for that. Now, if you look at the 40-year, there maybe more in there, okay. So 37 is the total that is referenced entire, the entire... over the entire plan.

Dan: Yeah.

Dave: We looked at 20 because of the fact that that's what we are developing in Overisel at the time. But as I mentioned here, you know, we are considering, uh, two scena— two, uh, uh, opportunities. Um, for up to 15 a piece, uh for a total of 30. So, you know, really, or officially, I'll take [defense] to that. I mean it was, again, you know, we're looking at... and we did... the other thing that we did in the Community Energy Plan is, is, that was different is the combined cycle unit is one... is one, two on one combined cycle unit. The Community Energy Plan contemplated really small combined cycle units.

The problem is the capital cost goes through the roof; the operating efficiency goes out the window, and, and you don't really have that kind of realistic deployment in the electric industry. There are... you know, the fleet of available resources really aren't there for that. So we have to apply, you know, what is reasonable in terms of electric generation deployment of resources to match as close as we can, the strategies with the Community Energy Plan. It's not an

implementation plan, it's a strategy and, and we have matched very closely with what is in the strategy.

Ted: Looks like we either touched on directly or answered a similar questions for every question online and, and here locally.

Speaker 3:
02:14:00 I don't think so. I put in a question asking about specifically what happens with emphasis on natural gas here if your [inaudible 02:14:11] you can't be met, you know, more than 50 percent of, of the, CO2 you're currently at or even more because I think that's a real possibility.

Dave: Okay, if that question is in there, I'm sorry that that, that got missed. Um, uh, you know, if you look at the new source performance standard that's out today, and again, and I'm not going to make this a practice of doing this tonight. By the end of the night, if somebody feels like their question was missed, and we try to cover from a topical perspective and, and while we could answer every question directly, we try to catch everything. And if that was different enough, I will say there's a new source performance standard out there, uh, that takes effect, uh, it really has taken effect at this point. And if you had a permit, it doesn't take effect until, uh, next, next March.

But the reality is that's there today and I have, I think a thousand pounds per megawatt hour is the emission rate for CO2 sources. So combined cycle unit, the, the consideration on why that was made is that natural gas combined cycle units would be able to meet that, meet that kind of target especially if we say, "Look, if-if you take the thermal energy that will create for district heating and make a megawatt equivalent to that, I think that we far exceed the new source performance standard."

I mean if you... we compare... if you compare this kind of unit that's using all the waste heat for beneficial reuse, you stack it up against, uh, a natural gas combined cycle unit that's just out there pumping out electrons and not doing anything else with the waste heat except sending that plume out the cooling tower, you know, we far are going to be better performing, uh, than that resource. So I have no concerns, unless in this country energy policy wants to shut down all fossil fuels completely, and I don't see that coming, uh, and maybe you do.

Speaker 3:
02:16:00 I seriously do, that's why I'm asking the question.

Dave: But... so I don't see that as a, a likely outcome. So I think I feel very good about how the resources we would deploy here would stack up against others in the fleet, so.

Speaker 3: Okay. I appreciate the answer because, you know, I just wanted to know.

Dave: Yeah, yeah. Thank you.

Ted: I'm sorry, Dave. That was right here. I missed that one. I apologize. Uh, we got one, one more from the audience. Has BPW considered a binary thermal power plant?

Dave: I may need to defer to Jim on that one again.

Jim: I think the... I think the reference to a binary thermal power plant relates back to the question on geothermal plant because there are several different types of geothermal facilities. One of the more common and actually a higher efficiency application of geothermal is a binary system. So to the extent that there's a geothermal resource which in many case is the U.S. is out west in California, Nevada, um, Utah area. Uh, a lot of the new geothermal facilities are going in are binary cycles. Yeah, we simply don't have a resource at Michigan.

Dave: Okay. Uh, this is the last one I've got here and I think it's one we've covered already, but I'll just going to go through it again here. Why not consider the effects of methane emissions on warming given the effects there are in CO2 equivalents?

02:18:00 And again, this something had to do with whether you're going to consider methane or not consider methane. This is a question of where you draw your envelope around the social impacts and the issu— that the envelope has been drawn in this evaluation around the combustion of the fuel, not the extraction process. The extraction process and any sort future impacts to it have been taken into consideration in the fuel price projections where if methane has to be dealt with or water, uh, that's there it has to be treated and other things have to be dealt with from that standpoint, those go to drive operational cost and therefore, the fuel price projection associated with that different technique. And so, um I think that's what we touched on earlier. That's consistent with the answer that was there before. But I want to restate that that was a card, um, that we have, uh, as well from [Greg Merck 02:18:14]. So I appreciate that.

And uh, I want to say I appreciate everybody being here tonight. Uh, I liked the the dialogue and, um, the ability to, to respond to the questions. I think we have a very unique opportunity as a community here to, uh, do a tremendous, uh, job implementing a very efficient, uh, diverse power supply portfolio that has ways of benefitting the community beyond what we're doing today. And, uh, I look forward to continuing the conversation, uh, having, uh, um, and again, looking at October 29 as a date that is, it's tentative at this point. We're trying to lock that

down, uh, for a capstone event. Um, and so we'll have more coming out over the next, uh, few weeks as staff, uh, starts looking at making into recommendations that will be deliberated and considered, uh, at a capstone event. But, uh, again, no final decisions would be made until actual resolutions are brought to Board and Council to adapt those staff recommendation.

02:20:00

So while we are still sometime on that process, um, we're reaching a conclusion. Uh, we are getting to a point where we are, uh, at, at close to a point of being able to make those recommendations and, and have staff and council deliberate on those. So again, I appreciate everybody's, uh, uh, attendance tonight and interest in submitting questions. And again, comments still could be received and we are continuing to have our P21 site available to you for, uh, additional information as well. And like I said, if anybody needs to follow-up with specific citations or other things, um, please, uh, see Ted or myself or, or Chris, or Angela, with your email address so that we can, uh, uh, get that information to you as a response to that particular question that was post this evening. So again, with that, thank you so much for being here. Enjoy the rest of your evening.