

Data Center Question/Answer Session With Reed Page

Reed Page: Director of Gas Operation and Business Development for Summit Energy, energy industry expert familiar with 9 Mile Data Center application

Steve Evans: Interviewer, owner of Evans Family Media

*Interview audio available at basinnow.com/public-affairs

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Steve: Tell us a little bit about Summit Energy and your involvement with the project.

Reed: Sure yeah Summit Energy has been around for about 25 years as a regional natural gas marketing trade company. We buy and sell physical natural gas commodity. We aggregate and purchase natural gas from independent oil and gas producers throughout the Rockies and we handle the transport of those gas volumes through interstate infrastructure through interstate pipelines and for delivery into large demand areas like Wasatch Front through the Enbridge distribution system. We also have customers, commercial and industrial end use customers, in the Uintah Basin but really in every corner of Utah where Enbridge distributes gas. We are able to flow our physical commodity through their system through their distribution infrastructure and deliver it to our customers. So some of the energy and Enbridge have customers in common. Basically the same customer will be using Enbridge's pipes to buy Summit's natural gas. Because of what we do, we in the last 2 years have seen just a lot of inbound requests from developers of all different types trying to figure how to build data centers because the power grid is so tapped out, so behind on being able to meet these massive new demands that they are turning towards on site power generation behind the meter with

natural gas generation equipment, natural gas reciprocating jet sets or even combustion turbines.

So I'm assuming that with the future demand that AI will make on our power grid this is why the traditional power is needed. Is that correct?

In large part but the grid has just gotten behind anyway because of the narrative around sort of 'electrify everything'. We are just bringing on a lot more sort of organic demand growth just through Utah's continued economic growth and population growth. We just have overall sort of standard power demand that has been growing pretty robustly in the last few years but then you layer on top of it all of this AI demand which kind of just blows the rest of it out of the water. I think that your natural demand growth was only maybe a few percent per year. With AI it's like an extra 7 or 8% per year.

For those who don't understand the purpose of these data centers, is it to generate additional power?

The data centers are not there to generate power but they need lots and lots of power to run the computation, to run the GPU's, the sort of specialized chips that are used for a new type of compute, of AI compute, and it just requires significantly more energy than the old styles of compute that we used to do. But even if you use it 10 times as much energy its output is like a 100 to a 1000 times more robust than what we used to do with computation so we're able to do things with compute that were just entirely unheard of or unimaginable only about 6 or 7 years ago but it does require a lot more energy and this is why these large data center campuses are turning to producing their own power on-site with natural gas.

So there'll be a power plant associated with the data center?

Correct. That's the most common kind of setup now is to site a power plant adjacent to the data center itself.

How large will these data centers be and what is the impact on the environment around these data centers?

There is one active project that is producing its own power here in the state of Utah now. It just started operating, started producing power, for their new phases. It's called NOVEA out in West Jordan... I think those are each of those buildings is probably 400000 square feet maybe 4 or 500000 square feet I don't recall the top ahead but they're pretty big buildings each 1 of those can house a 100 megawatt chips approximately. I think, I believe the proposal and I haven't seen the details of the proposal for 9 months I think that that's probably the 500 MW at least on the power generation side our generation inside that they're targeting again don't quote me on this I'm somewhat familiar with the project but not directly involved at this point the buildings are pretty massive a building that can handle about 300 MW that might be 1 to 1.3 million square feet of data center space.

How much power will they generate?

They will need to generate enough power to cover their own tight load so if the data center needs 500 MW they're going to need to build a power plant of about 500 MW.

Will it be built bigger than that to accommodate future use?

It's likely that they will simply have space adjacent like they'll design the site so that you can have expansion capacity so you can build a major phase building for example but they will still later on generation

Where is the proposed location of these data centers?

I'm not sure on the second one I haven't heard a lot of detail on the second but the 1 that I am aware of, the 9 mile data center, that was run through the planning commission last week that's going to be set up on South Myton Bench to the Southwest of the city of Myton.

What will be the impact on our power grid if new energy is not generated?

If new energy is not generated... well (1) new energy has to be generated. It just has to because it takes too many years to get a great interconnection for one. We're talking very long lead times to get connected to high voltage transmission lines but (2) if at some point there is an interconnection made with high voltage the impact to rates and rate payers is it's a little bit up in the air. It really depends in my opinion on what type of entity is operating that transmission. For us out in The Basin I think it's in this case very fortunate that Deseret Power...the system that was targeted in the application for CUP. If the project can make a deal with Deseret and therefore with Moon Lake Electric which is a load serving entity in that territory they have the service territory for this I am pretty confident that they'll be able to make a useful deal that is helpful to the local grid and won't necessarily raise costs it's very difficult to just assume how it's going to impact rates but just rest assured that Deseret and Moon Lake Electric they're extremely extremely committed to doing things that are right for the ratepayers and for the members and owners of the coop.

What about the end consumer? Will the power Bills of individuals increase versus if we don't have a data center what will the power Bills look like there if that much demand is on the grid?

The power costs kind of only go up over time no matter what. Power costs are likely to continue going up and may accelerate just a little bit. You may outpace inflation. In my opinion, it probably will outpace inflation. Then lastly if you do have a data center in your area it depends on how it interconnects and how it interacts with your local grid. It's debatable how an interconnection with the Desert and Moon Lake Electric system would impact ratepayers in the Uintah Basin. Now if you're in Vernal it may not affect you at all because you're served by Rocky Mountain Power. It may or may not but it's such a complex question that there is no simple answer that is accurate.

You would assume that more power available would actually not affect the power costs for commercial or residential...

Maybe, yeah maybe. If they're bringing a power plant that interacts with the grid that is able to sell its excess into the grid when the on site load does not require it, that can be very helpful. You also add when it links up to the high voltage system it actually contributes to the stability and the quality of the power across the grid regionally so sometimes by adding both the combination of load and generation you can actually strengthen the grid for everybody and improve its reliability. Generally what the what the transmission operator is going to target is something that is useful to their entire system and to repairs.

What about the environmental impacts? It's been stated in some of the commentary online that there will be required about 1.5 million gallons of water per day. Is that an accurate figure or how much water will be needed to operate a data center?

That is a great question and this is probably the biggest most pressing question on everybody's mind is how much water is this thing going to use. Power and everything else is sort of secondary to this question especially in a year like what we're having. That number, I mean it's kind of a made up number online. I think it was just a comment it was made but it's rooted in a kernel of truth from data center construction for the last like 20 years. In the past, data centers used to use evaporative cooling in their cooling systems to keep the computers cool, to keep the service cool, but they no longer can do that because there is so much energy density, so much heat coming off of them, that you just can't do it anymore. You can cool a chainsaw right with air but you can't cool you know a 400 horsepower BMW engine with just air or with evaporative cooling with a swamp cooler. You have to use closed-loop liquid cooling. This circulates and rejects heat to a radiator and that is the direction that all of these data centers have gone to is closed-loop cooling so they're essentially Zero water consumption. There's some that have a little bit of water consumption under the most dire circumstances but the design and the construction they've gone to has really gone to Zero water consumption on the cooling side. Not just because of water scarcity but mostly because of physics and thermodynamics. So I would say that 1.5 million number is really made up. It's not really rooted in truth here for the design that I think they're probably going to

use. The other thing too is any water they will be consuming is mostly going to be for potable culinary use. It's going to be used for the personnel that were there on-site and it could be anywhere from 5000 gallons a day to 10000 gallons a day depending again on how many full-time employees are there. It could be up to 15000 gallons a day but that might be less than half of the water consumption of your local high school.

So the water consumption is pretty minimal compared to some of the comments that have been made online. What about fuel source? What will be the fuel source to operate the generators to generate this electricity?

For this project from what I've read and what I've seen in the application of the target is for natural gas fire generation. I'm not sure which technology they are trying to use or design to whether it's combustion turbines or reciprocating engines but we're seeing both of those selections at large data center projects all over the country. So either way it's natural gas is your primary fuel and you know you spin something and you make electricity with it. Do it at very very very large-scale. So natural gas is the choice and fortunately for us the Uintah Basin we have quite a bit of natural gas to go around, more than we need, to take the natural gas that otherwise is worth not so much and is difficult even to market and to get to more valuable markets it makes a lot of sense to do a value-added process within the Uintah Basin to take that primary energy source and turn it into something much more valuable that it's actually quite easy to export over fiber lines. So when you think of a data center you can think of it as like a factory that takes raw data in, combines it with energy and processing and outputs what you would consider refined data. It's very similar to an oil refinery but of course we're talking data at ones and zeros.

Speaking of natural gas usage, what will this extra consumption of natural gas do to our ozone attainment and EPA permitting?

Any project like this is obligated, is required to receive airprints(?) if they're going to be producing their own power on-site. They'll be working through the Department of Air Quality who administers the new source review process and so, because we're in ozone non-attainment...right now we're still classified as marginal, there is a 100 tons per year limit for nitrogen oxides and volatile organic compounds, those are both ozone precursors, and so they will have to show compliance with those. If they go up-and-over those thresholds they'll have to do extra legwork to get themselves back underneath that threshold and that might have to do with changing your run schedules and/or maybe just down the project to a certain degree but they they will have to meet those criteria they have to meet those thresholds and get fully permitted under the Clean Air Act which is an EPA reg that is administrative at the state level by the DEQ. Anytime you're making anything you are going to create new emissions... But they will have to be fully compliant with their control technologies and their emission controls.

How are these projects going to be funded? Are local taxpayer dollars going to be used?

Yeah that is a concern. In the past, some municipalities back east in particular have taken a little bit more risk upon themselves to finance some of the infrastructure to try and invite these types of projects into their communities because they see the possibility of huge property tax revenues coming in which is true. What we're seeing now is these projects are not going to be relying so much on local incentives or special deals on the backs of the taxpayers. They're really really focused on can we get this project off the ground? Can we get our political approvals? Our entitlements, whether it's a use permit or rezoning and is there enough energy available in this location and labor force? Are all the other boxes being checked on the infrastructure side? And that's where they just don't rely on local support directly in terms of taxpayer dollars. These projects get papered up. They get financed on capital markets. They're not meant to be financed by taxpayers. They're meant to be financed by the cash flows of the project itself. There are some unique mechanisms here in the state of Utah particularly the Utah Inland Port Authority which I believe all this acreage has already been amended into a Utah Inland Port Authority project area 'Black Gold' and the UIPA process and the tax increment finance structures are extremely unique and in my opinion they're very

very very helpful both to the community and to the developer themselves for a whole bunch of reasons that are a little bit complex and generally you need to be at a whiteboard or have some visual ways to help walk through them. But no I guess to put a fine point on it, no this is not meant to be built on the back of taxpayers.

What about supporting infrastructure...transmission lines, substations, roads, right of ways, into the facility, etc. Let's start with transmission lines. What type of investment is going to be made there and is that a whole new permitting process that needs to happen or can it be tied into existing transmission lines?

Again, speaking in generality because I'm not directly inside of this project, but I did see their application, projects like these if they do need to build transmission lines to interconnect with other regional transmission that they pay for themselves or they'll work out some sort of payment, some sort of a structure finance deal to get that type of infrastructure built for themselves. So this is infrastructure that wouldn't be put up if not for this project and therefore the project needs to pay for it over time. So that's just on the high voltage transmission side. On the pipeline side it's exactly the same. The bypass financed by the project in order to interconnect it with the high pressure interstate pipeline.

So no additional local resources or taxes are going to go up to pay for this project?

Correct. Now that's the intention right. I'm going to say we will be leaving that up to our public officials to ensure that they are haggling, that they're making the best deal for the public, right, and not taking any risks, any undue risks with public funds, public resources and I think we have a great group of people that are out there making these deals, at least for Duchesne County.

Do we have the support from the governor's office?

I'm not sure about the governor's office. The governor's office doesn't generally just kind of go out and make blanket approval statements for projects but I will say that the governor's office has messaged that the state of Utah is open for business. And they have continuously messaged their support for the right projects in the right places subject obviously to local land use authority approval and municipal and county participation in the whole process. So if it's a good project the governor's office is going to be very very supportive especially as much as it supports kind of the larger American narrative of being the compute capital kind of of the world and the, I could say the race with China to get ahead in the AI race.

You know a big question here is what about the economic impact? How many jobs will be created both through the construction period and post construction period?

A construction period is where you will see it's kind of front-loaded, you'll see a lot of jobs come in for construction. I think this is going to feel a little similar to like the railroad conversations. There's going to be a lot of people out there building these huge structures for a few years and then once you're fully built out (maybe there's multiple phases over the course of you know 5 or 6 years, I don't know what's been proposed) but you will see an influx of hundreds of jobs many hundreds maybe even closer to a thousand jobs in the construction of the campus on the side, especially since there's also solar aspect to it, there's an next few 100 jobs probably. So during your construction phase you can have lots and lots and lots of jobs but during your operational phase it narrows quite a bit down. You might have just a few hundred people on the campus. Generally speaking, projects like this will end up with a few hundred high paying jobs. High paying like over a \$150000 per year.

What about the timeline?

So this depends a lot on whether the project can find a capital partner that wants to build this thing all the way up. So as soon as a project like this reaches final investment decision and there is like a full cast of characters, the Partners and the Capitol involved, the target is usually to have your first phase up and running within 2 years of shovels in the ground. They were going to get shovels in the

ground a year from now if possible and that would be really amazing if they did. Then you should be in production 2 years from that point, maybe 3 just because generators now have the incredibly long time, substation equipment and Transformers are way way out on the time. So we're a few years away from first power but actually I'd like to go back to economic impact because we only talked about jobs. We did not talk about property taxes. And when you look at the value of a campus, let's just assume that it's 500 MW, we see something like, let's just use the heuristics that we see, \$12 million per megawatt capacity goes into building just the building and the cooling system and the power system and this excludes the power plant itself. So call it a \$600 million per build of this set of buildings. Then you will load it with computer chips that are worth probably about twice that, probably about \$1.2 billion worth, actually my numbers might be off by whole order of magnitude, but you're \$5.2 billion I guess on your building construction for 500 megawatts worth. Then it's about \$10 billion worth of microchip to go into these buildings. All of this is subject to property tax or personal property tax so there's either real property tax or personal property tax. So depending on how all of this gets financed... you will likely see something like in the tens of millions of dollars in new property tax revenue coming into the county that could go into the general fund and not seeing all the details of the project but it is likely to be in that sort of scale in the tens of millions of dollars that gets returned to the county during a tax increment finance period which I assume is going to happen because they're part of UIPA. Then when this kind of period ends, all property tax, all personal property tax will then be fully returned to the county once a lot of this infrastructure is paid off. In 10 or 15 or 20 years then you're left with many many tens of millions of dollars left to the county. And to me I think that's transformative considering the fact that so much of our impact, of the impacts of infrastructure in the Duchesne County, are because of oil and gas operations oftentimes not on federal ground, on private and tribal and state ground which is subject to severance tax which does not fully come back to Duchesne County. So it creates some challenges. On federal royalties... more of it does come back through CIB money but because so much of our more recent production growth has been on nonfederal land we've ended up with this outside impact from attractive industry that has not been fully made up by severance taxes. I think that a project like this one, like this Data Center and potentially the second wherever that one is, would be absolutely transformative for Duchesne County in terms of revenue available for general fund

for providing public services, potentially even reducing people's property taxes to their homes. That is a very real conversation in many of these communities throughout the state of Utah. They never ever reduce your property taxes. This type of a project will make that possible.

Are there any final comments that you'd like to make before we bring this discussion to a close?

Sure I'd like to say I'm supportive of these projects. I think that they can do they can be done well. I do trust in the people... I no longer live in Duchesne County but I am very very close. I'm still out there for business purposes and I visit frequently. I am still in very close contact with elected officials and of people who are in charge of of taking care of the community and in fighting for the benefit of members of the community out there and I am confident that they will be able to hold these projects accountable to what they promise and they'll be able to make the types of deals that makes sense for the community and can be transformative to the community so you know I'm here to support these types of projects in every corner of the state of Utah where it makes some sense. But I'm also willing to be realistic about the impact and to go right into detail when anyone asks me about them. Consider me a resource anybody out there if you want to get ahold of me...I'm still the Rocky Mountain energy economist and anybody that has questions is welcome to give me a call and just ask how these things work. Call me on my cell phone and I'll answer 435-659-9084.