



Green Plains Inc. |  
36th Annual ROTH Conference | March 19, 2024

**Craig Irwin**  
*ROTH MKM*

My name is Craig Irwin. I'm Senior Research Analyst, I'm covering sustainability at ROTH. So our two-day institutional investor conference will feature 100 fireside chats and about 30 panels. There are more than 400 public companies available for one-on-one meetings. And if you've not booked meetings yet, please visit our one-on-one desk upstairs by the cafe. Panels and track line-ups are electronically displays throughout the venue. As I'm sure many of you have seen, everybody's seen. And you can also use the app and paper schedules and the team upstairs can help everyone.

So I'd like to give a special acknowledgement to our sponsors for the track Sustain OC, my friend Scott Kitcher and then Blueshirt Group is obviously Gary Dvorchak, long-term friends and partners of ROTH. And really, I just wanted to say thank you for making the trip to Orange County and I hope you enjoy your time with us. So one-on-one meetings are subject to change and the kiosks upstairs. You can print your most recent schedule and then obviously team can help you straighten anything out.

Please visit sponsor booths and then lunch is going to be in Monarch Courtyard, Raya Restaurant upstairs, and then Pacific Promenade Ballroom. So lastly, Wi-Fi, which is probably the most useful thing for you guys, if you haven't already got it. The network ID is ROTH and there's no password. And again, thank you all for joining us. Appreciate you being here.

With that, I'm going to jump right into my fireside chat with Todd Becker. Give me one second. Okay. So thanks everybody for joining us. Craig Irwin. I covered Green Plains, gosh, more than 15 years now. Todd Becker is an old friend, a Chief Executive of the company. We're going to do a fireside chat today. So I'd like to first say thank you, Todd for joining us. The piece of the equation we're most excited about right now, there's lots of good news in the operations, but the one that's really ramping is HiPro, right? Can you give us any update on protein, what you're seeing in the market as far as pricing and tonnage and how this is being taken up by your customers?

**Todd A. Becker**  
*President, CEO & Director*

Yeah. Thanks, Craig. And for sure, HiPro is high protein ingredients are a very important part of our strategy. It's one of the reasons we bought – invested and bought into a ag tech company three or four years ago called Fluid Quip Technologies, they had a portfolio of really disruptive technologies that can take a single kernel of corn and transform it through a dry milling process, which is what we do into multiple ingredients that are worth a lot more than our base business.

While it's taken a lot of time to get that done, transformations take a long time, and they always take longer than you ever think they do, especially in the age of supply chain like we have. But we've now invested \$350 million or so in our own platform, and we have another investment joint venture with Tharaldson that's also coming online as we speak. So we've converted the equivalent of 560 million gallons of production.

And what was coming out of there, we've converted that into high protein, the ability to make high protein ingredients, and we'll get in this – what those really are in a second. On top of that, Tharaldson is coming online as we speak. We're in the startup phase, so we are actually making oil through the system that's where we started, and we'll make protein in the next month or so.

So that's absolutely in the startup phase that gets us about, and that's a one of the largest ethanol plants in the United States converted now. So that's in total for our owned – for what we own 650 million gallons or so of converted protein production. What it does is it grabs the fiber that used to just get made into a low protein, low value ingredient, and it upgrades it and it grabs a piece of it that's the highest value of it. It's like splitting atoms.

So we've been able to do is with that conversion, the market thought where are you going to sell it all? Well, we're sold out of 50 pro every day, and we don't have any trouble selling the base ingredient because it does compete in a market where protein is valued in a per unit value of protein. It's just a matter of if you have a product, will they use it? And this is a really great product, number one, it tastes good to the animals or to whatever we feed it into.

Number two, its really – the feed conversion ratios are high, and the value of the product is really high as well. So the first step was to make 50% protein, get it into the market, seed it first in pet food, the highest value market in the world for feed ingredients, one of them, as well as into aquaculture, but also understand we're going to be selling it into poultry and hogs and cattle and other places besides just dogs and cats and salmon.

So we've been able to fully penetrate that market, fully get into it, values they move around a lot. What you've seen is the compression of corn versus soy here recently. So with corn and soy narrowing in, we're still be able to maintain the margins that we've outlined. Somewhere between \$0.10 and \$0.15 a gallon, really more like 12 – \$0.10 and \$0.18 a gallon, but more like \$0.12 to \$0.15 a gallon uplift over the long-term for the base product, no problem selling it, great acceptance.

Everything we bring on, we sell. So that's not really the issue. But we actually didn't convert our plants to make 50% protein. We actually converted our plants to make 60% protein, which is the highest – one of the highest value proteins in the world. And so that's really the next step to where we're going. We've been working on that now for well over a couple of years, trying to get that into rations around the world, and we're just starting to see those orders come in.

And it takes that long to introduce a product like that. The 50 pro is easy because that's just a competition with a very highly commoditized soybean meal. The 60 pro is a lot harder because then you compete with much higher value products. And it just takes time too for regulatory labeling. And salmon, it takes two years to feed a salmon, those type of things. But we're getting very, very close. We're starting to get commercial orders in for our 60% protein. And we're actually now running our second test of a plant. We know Wood River can make it at scale. We're now running it in Central City at scale, just to make sure that we have multiple plants that can get into the 60 pro market later this year, as we're starting to see orders come in as well.

So it's a good path. I mean, I'd say we're a little bit far – little bit behind on the schedule, mainly because of permitting in states that it's very difficult to get a permit. We have definitely one more we want to build that gets us up to 680 million gallons plus there also is 750 million gallons converted. We love the product. We love the opportunity, and we continue to make great progress on it.

**Craig Irwin**

*ROTH MKM*

60 pro, right, you're going to have the capacity. It seems you've been a little bit conservative around your expectations there. You were saying 20% and 30%. What's the potential for that to be the majority of the mix over the next couple of years? What do we need to see to have that materialized?

**Todd Becker**

*President, CEO & Director*

If you give me a couple of years from today's date, we'll be selling 100% of our – I'd say 80% of what we produce in those higher proteins. Number one, we're working on a strategy around how to get it to market. What's the supply chain look like? It just takes a lot of time. When you're going to Chile or Peru or Turkey or other places around the world who buy this product regularly, just the supply chain had to get built on top of that. They had to take time for trials, right?

When you think you're the end of a trial and they say we love the product, they say, but we'd like to make sure that the flay color of the salmon just maintains itself for six more months,

okay? So those are here, but they – nobody said they're not using. They won't use the product. So – and we have multiple different strategy around how to hit the market and what we can do with that product and how we can manipulate what that product does.

The cool thing about it is – it has 25% yeast or so, which means in that yeast we can actually dial-in what parameters we want to set. Do we want it to taste better? We could probably put a peptide in there to make it taste better. We want it to have a different amino acid profile. We could change that up in fermentation. Nobody else in the world can do basically what we're doing at scale.

This is the first time since really soybean meal or distillers grains 15, 20 years ago, when a plant based protein product 50 or 60 pro was ever brought to market. In the scale, we're bringing it to market. Some people have said, oh, I can make that. But they make 5,000 tons. We're going to make 400,000 or 500,000 tons of product. That's a very different opportunity set.

So I think if you gave – if you fast forward three years from now, the significant majority of what we do will be 60% protein or greater. And we can tell you that because we have a whole team working on it. We have a dedicated team. That's all they do is work on customers around the world and domestically on 60% protein or higher. And we have enough demand identified, discussed with customers that could take every single thing we produce.

Now you have to get them to actually move forward and give us the purchase order. One thing that slows it down is regulatory. Like for example in a pet food company, labeling, what do they call it? What's the IFFCO definition? Those type of things got. They have to get through all their own legal stuff. They have to change their bags, all that, it took a year for pet food manufacturers just to change their bag to include the 50% product. It's just time.

It's not a – it's a matter – if it's just a matter of when. And there again, real quick the margins are hanging in there, right? We've seen a compression of when soy compressed the corn. Corn gluten meal compressed the soy, so the margins are all compressed on protein. But we're starting to see them widen back out again.

**Craig Irwin**  
*ROTH MKM*

And then the premium over soy, I know it kind of moves around a little bit the near-term premium, right, for 50 pro versus 60 pro. Can you just sketch that out for people? Because economics are really what everybody care about...

**Todd Becker**  
*President, CEO & Director*

Okay. Listen, it's not about romance, it's about finance, right? So like – so for example, the 50 pro market, what we said was \$0.12 to \$0.15 a gallon. We've seen it as high as an \$0.18 a gallon uplift. Its only – remember, it's only on less than 10% of the raw materials, its uplifts our whole margin \$0.12 to \$0.15 a gallon. So it's a very small piece of what we grind every day can uplift that.

**Craig Irwin**  
*ROTH MKM*

Yeah.

**Todd Becker**  
*President, CEO & Director*

So – and what we also said is then from there, there's another base load \$0.12 to \$0.15 a gallon. So it gets you to \$0.24 or \$0.30 a gallon on base load, thinking it can go as high as \$0.40 to \$0.45 a gallon. We're still seeing those type of opportunities. We're still seeing a \$0.20 to \$0.30 uplift for 60 pro on top of distillers grains. So if you take that over a whole platform of 750 million gallons converted, that's \$250 million. That's just the uplift if we can go all the way to 60 pro, that's actually a narrower spread than what we identified because we've seen corn gluten meal come down.

And the first step we compete against is corn gluten meal. And as we add different aspects to the protein of an amino acids or taste profiles or those type of things, that's where we go start to accelerate away from that and try to get somewhere near fish meal. We'll never get to fish meal, but we've seen those margins hold in there. That's the whole base of the whole strategy, which is why we bought Fluid Quip.

**Craig Irwin**  
*ROTH MKM*

That was the alpha to the delta for everybody that was overly focused on corn ethanol last quarter. I'm guessing it will be again this quarter. So if we can just change to what's new now, right, what's tangible and real, your Clean Sugar strategy, right? You've got your first at scale plant coming up. This is like HiPro 2.0, but better.

**Todd Becker**  
*President, CEO and Director*

Oh, it's so far beyond HiPro 2.0.

**Craig Irwin**  
*ROTH MKM*

Yeah, I know, but can you explain to people what it is? Because everybody's still asking what's Clean Sugar.

**Todd Becker**

*President, CEO and Director*

What's Clean Sugar? So we – when we split open a corn kernel, there's starch, there's fibers, and there's carbon. So the fiber gets made into the protein products and the veg oil product, there's vegetable oil in the fiber. The carbon goes up the stack, and we're going to capture that. We'll get into that in a second, I'm sure. And then the starch gets converted into alcohol. Instead of converting that third of the kernel and starch into alcohol, we're going to not make out. We're going to turn left and/or right, it depends where you want to go, but we're going to make a turn and we're not going to go into fermentation. We're going to go into securification.

And it happens every single day in the United States. This is not – this isn't a new invented catalyst. This is something that's kind of happens every day at other processing plants but never happened in the ethanol industry to dry milling. So instead of making alcohol, we'll take that starch and we'll make dextrose because it is a dextrose molecule at the end of the day, that's what we're doing.

It is starch converted into sugar, converted into dextrose, converted into end products as well once we sell it. So that's all of that, really, we're really doing. We're going to make less alcohol and make more dextrose. Now, why are we doing that? Well, first of all, let me just tell you, everybody thinks we bought Fluid Quip for protein, the protein technology. We actually bought them, we got – and then we got sugar. Actually, it's the other way around. We bought them for sugar and got protein because sugar is really, that is the absolute most disruptive thing that we can do to agriculture today and our company.

When we start up this plant in the next 30 days, we are in the process of starting it up. When we ship our first product, the world will take notice in the next 30 to 45 days when we load a truck of dextrose shipped to a commercial customer, whether it's industrial or food. They don't want to believe we can do that. The incumbents, there's four incumbents, and they do not want to believe that we can ship dextrose to their customers. But I will assure you, within the next 45 days, we will ship dextrose to their customers.

And that is the wakeup call for our company, for our market cap, for our valuation, for the disruption of what we're going to do and for others in the world that not understand the value of this technology portfolio we have. Think about it like this. We talked about \$0.12 to \$0.15 a gallon uplift on protein, right? We talk about \$0.11 a gallon uplift on oil or \$0.12 or \$0.13 or \$0.14.

The first truck that we ship of dextrose at the equivalent uplift per gallon of ethanol is \$0.85 a gallon or \$0.67 to \$0.85, it just depends. So that's – it's so disruptive. So if you take a look

at that, why are we so focused on it? Because if you look at the incumbents, they're making so much money in wet corn milling. It's obscene the amount of margins they make. And they don't believe we can disrupt it, but they're starting to believe it now.

**Craig Irwin**

*ROTH MKM*

\$0.85 a gallon. What's the CapEx underneath that? I know the numbers are – you're tightening in because this is your first...

Todd Becker

President, CEO & Director

Yeah, our first plant is about a \$60 million – \$50 million to \$60 million plant. Just depends on how we settle out. And it's converting about a third of Shenandoah, right. But as we scale, it'll get better, somewhere between a \$1 and \$2 a gallon equivalent of CapEx conversion. So you have your ethanol plant and then you have a \$1 to \$2 a gallon depending on the size and scope. The next one we will build and the next one we will announce will be significantly bigger than Shenandoah, probably 2 to 3x that size.

We'll take 120 million gallon plant. We will convert a significant portion of the next plant. We're working out where that's going to be. As soon as Shenandoah works, we know we have to get on track to announce where we're going to do the next plant. It's going to take a couple of years. That will bring another 700 million, 800 million pounds to the market. It's a 17 billion pound market and growing every year. We have customers calling us that are asking us for the product now and the product that we're going to produce in the future. That's how exciting this is to customers to have a new alternative. But the most interesting thing about our alternative is we're 40% lower carbon intensity than the incumbent.

Our intensity of our carbon, our carbon scores are significantly lower on our dextrose than anything made in the world today. Now we might think ESG is not really a focus of these consumer products companies, because they don't talk about it as much. But let me just assure you, they're absolutely focused on raw material inputs that have lower carbon intensity.

**Craig Irwin**

*ROTH MKM*

Well, that's a good segue into the next one. So 40% getting better, right? So I should say, high five to the guys at red trail for the press release a little over a week ago, right. First, little plant in the country to actually officially monetize the carbon credits and clients can read the filings on the SEC website, right. Nobody wants to believe carbon is real, right. Can you update us your unnamed partner that comes on for 2025. We could all guess who that is, but I won't say it in public. And then obviously you are a founding investor in Summit Ag. Can

you talk us through the \$100 million in EBITDA? Sort of 25, what that looks like, how that comes on?

**Todd Becker**

*President, CEO & Director*

Somewhere in 2025, we will start to generate about \$100 million to \$110 million of EBITDA from our Nebraska assets. The first pipeline that will be operational will be in Nebraska. It's already in the ground. It's already built. It was a natural gas pipeline that was abandoned and they got a FERC abandonment for it, so they could ship carbon in it to Wyoming, which is a primacy state. And so you don't have to go to the EPA Class 6 permitting process. And they've already late last year in December they approved their first three Class 6 wells or so.

And then our project that we're involved in, we're not investing in the project, we're just shipping on the pipeline. They're up next for approval in Wyoming. And again it's primacy so the state can approve the Class 6 wells. They've already bought all their pore space. So this is a project in Nebraska that we have three plants in Nebraska will be the largest or one of the largest shippers on this new pipeline should be start up in mid to third quarter 2025. Our investment is about \$90 million to \$100 million of compression equipment.

They have 100% of their ability to survey done now, which means that leads into 100% of right away's next step. It's just 10 or 20 or 30 miles little laterals they have to build to our plants from the mainline. Nebraska is all over it. It is not like other states. You can approve it at the county level. And they are absolutely believing that it's advantaged Nebraska. So they want to be the first.

So it should start up mid-2025, we'll take – we produce about 800,000 to 900,000 tons of carbon in the state and then we'll monetize that through 45Z's first, 45Q's after that some carbon credits once. And what you were referencing is the first ethanol plant, one of the first that got their carbon certified as gold standard type carbon, and that'll just be the next steps. Now, you can take those and either sell them for carbon credits or send them to LCFS markets.

The economics are excellent. I think the milestones you need to watch for us is number one, when does the project get their Class 6 wells? Once they get their Class 6 wells, then we will order our compression equipment. The compression equipment will get ordered. The laterals will start get beginning built. They're already upgrading the line that they have. They have most of their pore space done. We're about 90% through what we need to do to order our compression equipment. We think in the next 60 days or so, we'll get those Class 6 wells. They'll get the Class 6 wells approved in Wyoming, and off we go.

And then a year away and it generates literally \$110 million based on current economics, with the 45Z of just recurring revenue for the first two years. One year payback on the project, and will be the first real volume of decarbonized alcohol in the world.

**Craig Irwin**  
*ROTH MKM*

Amazing. Amazing. So many other interesting subjects to talk about. I got to pick one. And the one I think is probably least understood right now or least discussed, is what you're working on with Shell. Can you bring that to the front for people and give us color on that?

**Todd Becker**  
*President, CEO and Director*

Sure. So we have all these initiatives around protein, oil, sugar, carbon. And in all of that exists a technology that our partner at Shell has been developing for many, many years, and with a significant amount of capital invested. And we met and they can basically take whatever from a whole corn kernel to the post MSC fiber that we make, put it into their process, run their process, and liberate all of the remaining oil, sugar, and protein that's left. So you don't make DDGs anymore.

You're going to have all the oil available on the corn kernel. You're going to make cellulosic sugars. The problem was that it kind of came out in a glob, right. It's the best way I can say it. And that glob needed to be separated and Fluid Quip Technologies, which we bought into and invested into. We believe they owned a premier mechanical separation technology in the world. So when we took their glob of stuff that came out of their reactors, we put it through our separation technology. We now could separate the rest of the oil, the rest of the protein, and the rest of the sugars. Those sugars are potentially – they are cellulosic. They can make cellulosic ethanol, but we'll have to get our pathway approved for that as well. We are on the verge of turning this on.

Literally, we're within 30 days or so to turn this technology on. It could be a – I mean, take sugar, take protein, take oil, and then multiply that by about five. And that's how disruptive this could be, because you could literally, in the simplest form, drop a kernel of corn in there. It'll blast it open, get all of the protein, all the oil, all of the sugar in a single process, and we'll separate it. It is very – you could take a soybean, potentially drop it in there, separate all the oil and protein. You could take a kernel of wheat, separate all, whatever you want. That's the capability of this technology. We've seen it happen, and we just have to separate it and ship it and earn a return on it. The cool thing about it is, like, for example, on the protein, it's hydrolyzed protein.

It's not the protein we make. It's actually a much more valuable product potentially, than we make today. It's hydrolyzed. The world cannot make hydrolyzed products like that. So it just is a totally different opportunity. We'll know very shortly. We're crossing our fingers. It's a big project in York, Nebraska. We were very quiet on it for the first couple of years, and then we kind of finally announced it as we need to hire people. But we are within a month or two of turning that thing on and knowing whatever works or not.

**Craig Irwin**  
*ROTH MKM*

Can you maybe share with us how much was spent on the CapEx for this project?

**Todd Becker**  
*President, CEO and Director*

I can't. Okay. I can't. But it's big.

**Craig Irwin**  
*ROTH MKM*

It's bigger. It's bigger than a biodiesel facility, right? I mean, I've seen this thing and it's huge.

**Todd Becker**  
*President, CEO and Director*

But it's still really a demonstration plant.

**Craig Irwin**  
*ROTH MKM*

It's a pilot. Yeah.

**Todd Becker**  
*President, CEO and Director*

It's not a pilot. It's beyond a pilot. I mean, it just can make commercial quantities. But really, what we would say, if successful, we could put it anywhere that we have an MSC protein system today, because that's what will separate, what comes out of the process that Shell has – it's called Shell Fiber Conversion Technology. And come out of that process, and it's potentially extremely game changing to agriculture.

**Craig Irwin**  
*ROTH MKM*

So game changing is a word I like. And I got another subject for you. So every energy guy I see, I'm like, you have to be invested in ethanol. It's not just because of the 10% in the gas tank, right? SAF, sustainable aviation fuel. The cynicism out there around SAF is you can cut it with a knife, it's so thick, right? But if we do see capacity deletion in North America, we can have a super cycle in ethanol. There's some really cool things going on. You've got a premier

partner with United. Can you talk a little bit about SAF and what you're doing with United and how this could potentially play out?

**Todd Becker**

*President, CEO and Director*

SAF, sustainable aviation fuel or alcohol to jet that we're able to do starts, first and foremost, with decarbonized alcohol. If you don't have decarbonized alcohol, you don't have sustainable aviation fuel from alcohol. And so our first step will be with what we're doing in Nebraska. We will have the first gallons of, in quantity, in volume of decarbonized alcohol as probably bigger than anywhere in the world today. And that'll start up in 2025. That will then lead into people's courage then to take on the opportunity to take that decarbonized alcohol and convert it into jet fuel. You can absolutely do it.

It's not a matter, if you can do it. It's a matter of – will you have the inputs, will you have the raw materials to then take it through the process? Now, there's several processes that are out there. There's UOP, Honeywell process, there's the Lanza process, there's the one we've been developing with United. But we're not singular to any process. We're an open book. We'll look at anything to convert our alcohol.

We don't really care, quite frankly, but we have great partners in Tallgrass and United on the development and the partnership of that. We're in great location to Denver and Chicago, which is why they like working with us. And we'll see where our own technology goes. But look, we got to get a little participation from the government. If you would ask me three years ago, we're going to have sustainable aviation fuel from alcohol, I would say absolutely no way, never going to happen. You ask me today, I'm better than 50-50 chance. We'll do some starts out with alcohol, but it's driven by policy.

If we don't get the right greet outcome in the next month or so from the government, if we don't get the right scoring outcome, if we don't get the right – the regulations that need to be in place, this isn't going to go and shame on them, because there's no way you'll make an impact in aviation fuel unless you do it with alcohol. You can't do it with veg oils. There's not enough of it, quite frankly, it doesn't matter. It's got to come from alcohol.

We can make 10 billion gallons of aviation fuel as an industry if we converted everything. If that were to happen, there's a super cycle because where are they going to get their octane for the vehicles? We're the cheapest octane on the planet today. We're seeing export pickups out of the U.S. We're coming out of the winter doldrums. And they were doldrums, let me assure you. And we're finally starting to see a pickup again in people wanting to buy our product. But as the ethanol industry sometimes does, they overproduce in spite of themselves. And we have incredible capability to make significant amount of money, but sometimes we get in our own way. But we're trying to get out of that cycle right now.

**Craig Irwin**

*ROTH MKM*

So Tallgrass is another interesting partner, of course, but you mentioned ethanol there, right? It's always pretty much always backwards looking because we can all monitor the crush. But can you give us a little bit more color you said people overproduced. First quarter has been awful, but it often is in the shoulder months. What else was going on in the crush?

**Todd Becker**

*President, CEO and Director*

Well, I mean, we're starting to see it come back a little bit, which is nice. I mean, we're finally starting to see it from the – like I said, it was a long cold winter, dark cold winter of ethanol, but we're starting to see it come back. What we're starting to see really is driving demand has been strong. Exports are strong. Stocks have kind of leveled out here at these 25 million barrels or so, maybe hopefully come down. We'll find out some more tomorrow. There's a couple of things happening. Gas is cheap, not here in California, but you go in Omaha, you could buy it for \$2.80 a gallon. So gas is cheap.

Airline fares are expensive. You're starting to see dropping of schedules, so they're getting tighter because they can't get planes delivered from Boeing. And we think that'll drive a really interesting summer driving season. Along with the fact that we're \$1.09 discount to gasoline today ethanol. So we're the cheapest molecule on the planet. Give us \$0.20 more, we're profitable, and then we're still only \$0.89 discount to gas, plus they get a \$0.55 RIN. So blending economics are incredible. 2025, we see those eight states get E15 year-round.

So when you add all that up together, coming out of this winter doldrums I think we're going to start to see stronger margins as we come out of it. And we'll just watch driving demand every week. Gas demand is excellent in the world. And then watch the products out of Russia, the bombing of these refineries, reducing Russia by 900,000 barrels a day. The world cannot afford not to have those products hit the market. So when you look at all that, I'm sure refining margins this summer are going to blow out potentially for the oil guys and hopefully we get to participate in some of that.

**Craig Irwin**

*ROTH MKM*

Now people know why Green Plains is one of my favorite stocks. So thank you, Todd. Thank you, everybody, for joining us today. Appreciate it.

**Todd Becker,**

*President, CEO and Director*

Thank you.