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PRESENTATION

Operator

Good morning, and welcome to the Green Plains Inc. and Green Plains Partners Third Quarter Earnings Conference Call. Following the company's prepared remarks, instructions will be provided for Q&A. I will now turn the call over to your host, Phil Boggs, Executive Vice President, Investor Relations. Mr. Boggs, please go ahead.

Phil Boggs - *Green Plains Inc. - Executive VP of IR & Treasurer*

Thank you, and good morning, everyone. Welcome to Green Plains Inc. and Green Plains Partners Third Quarter 2021 Earnings Call. Participants on today's call are Todd Becker, President and Chief Executive Officer; Patrich Simkins, Chief Financial Officer; and Leslie van der Meulen, EVP of Product Marketing and Innovation. There is a slide presentation available, and you can find it on the Investor page under the Events and Presentations link on both corporate websites.

During this call, we will be making forward-looking statements, which are predictions, projections or other statements about future events. These statements are based on current expectations and assumptions that are subject to risks and uncertainties. Actual results could materially differ because of factors discussed in today's press releases and the comments made during this conference call and in the Risk Factors section of our Form 10-K, Form 10-Q and other reports and filings with the Securities and Exchange Commission. We do not undertake any duty to update any forward-looking statement.

Now I'd like to turn the call over to Todd Becker.

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Thanks, Phil, and good morning, everyone, and thanks for joining our call today. Our overall transformation remains on track as does our theme of focusing on execution. And during the third quarter, we have made significant progress towards our 2024 goal, and the fourth quarter is proving to be even more exciting. First, let's talk about the Q3 results. As indicated on our last call, we expected the third quarter to be challenging as margins started out very weak. We had near record corn basis levels throughout the platform. And as we discussed, timing reversals of Q2 mark-to-market as well. Additionally, given the anticipated weak margin environment during Q3, we made the decision to accelerate our remaining scheduled maintenance shutdowns into September, which impacted our margins by $0.03 to $0.05 a gallon based on reduced production volumes and increased repair and maintenance expenses in the quarter.

While spot crush margins began to expand in September, we only saw a small benefit of that expansion as we had begun our fall shutdowns. However, as a result of shifting the timing of fall maintenance, we only had one maintenance turnaround at one of our smallest plant, Atkinson, in Q4. While operational timing did have some impact on the third quarter results, I'm happy -- what I am happy about is year-to-date consolidated production margin averaging over $0.16 per gallon, which we believe to be generally above market because of our strong first half results.

The fourth quarter has returned to a positive margin environment and based on the current market, we expect to return to profitability, even as we hedge some of this early to protect our balance sheet, we are benefiting from the expansion in margins, along with our higher run rates. I am pleased that we have secured our natural gas supply below the current market in physical, transport and financial terms through the first quarter of 2022 and partially beyond that. We believe we are well positioned to be able to operate through any natural gas environment this winter.

Operating expenses are seeing some inflationary pressures that are impacting the industry broadly, particularly in the area of urea, denaturant and sulfuric acid. Although with our Project 24 modernization program wrapping up, we will continue to see the benefits of reduced electricity, natural gas and water usage at our Project 24 plants, and we expect to see additional benefits as we increase production levels at these plants rolling into 2022.

The quarter was very exciting from a strategic standpoint, as we announced a new turnkey initiative to expand our protein footprint without increasing our exposure to ethanol, raise additional capital, providing greater assurance that our transformation can be carried out on schedule, broke ground on additional protein build-outs and finish the construction of the Wood River Fluid Quip MSC system. More exciting than the operational success are the commercial successes our team have been able to achieve and also the progress we have made in renewable corn oil, clean sugar technology, carbon capture and sequestration initiatives, all of which I will address a little later on the call.

Finally, our Board of Directors has continued its own refreshment initiative, significantly expanding shareholder rights while continuing to focus on good governance and adding diversity. Our Board recently appointed Jim Anderson into the newly created role of lead independent Director. Martin Salinas and Farha Aslam has also joined the Board, adding significant capital allocation, agribusiness and financial expertise. Additionally, the Board amended its bylaws, updated as charters to the audit, nominating and governance and compensation committees. And adopted a new board qualifications, governance guidelines and diversity policy. This has been in the works for some time as a result of shareholder input at our last annual meeting. Having sound Board oversight is critical to our ability to execute on our transformation plan and for the future benefit of all shareholders.

As previously indicated, Green Plains Partners was able to increase their distribution this quarter to $0.435 per unit. This was something we are excited to be able to do our unitholders. Now I'll turn the call over to Patrich to review both Green Plains Inc. and Green Plains Partners financial performance. I will come back on the call to talk more specifically about our thoughts around 2022, our ongoing initiatives and how each vertical fits into our transformation plan, all of which I think you will find very exciting. Patrich?

George P. Simpkins - *Green Plains Inc. - CFO*

Thank you, Todd, and good morning, everyone. We reported a net loss for the quarter of $59.6 million or $1.18 per diluted share compared with a $34.5 million loss reported for the same period in 2020. Our results for the period are inclusive of a $7 million onetime charge to depreciation related to the completion of our Project 24 projects and other initiatives, along with the $2 million onetime charge related to a true-up from the sale of our cattle business last year. Our plant utilization of 75% was favorable compared to a 66.8% run rate in the prior year and included the impact of the early plant maintenance plant shutdowns mentioned earlier and our Madison plant being offline during the quarter for Project 24 upgrades.

Adjusted EBITDA for the period was negative $14.8 million compared to a positive $6.8 million we recorded in the prior year, largely related to historically higher corn basis across our platform and higher (inaudible) costs associated with the change in our maintenance schedule, partially offset by higher contributions from our corn oil business due to strong demand from renewable diesel.

For the quarter, our SG&A costs for all segments was $26 million compared to $19.9 million reported in Q3 of 2020. The difference was driven in part by the addition of Fluid Quip's SG&A expenses during 2021 as well as wage pressure and higher legal expenses. Interest expense of $9.5 million was down slightly compared to $10.2 million in the prior year as a result of overall interest rates.

On Slide 9 in the earnings deck, we provide a summary of our balance sheet highlights. We ended the period with $764.4 million of cash and working capital, net of working capital financing compared to $226 million for the prior year quarter as a result of an active capital campaign during 2021, supporting our growth objectives. Our liquidity position at the end of the quarter included $720.9 million in cash, cash equivalents and restricted cash, along with approximately $312.6 million available primarily under our working capital revolvers and delayed draw term loans.

During the quarter, we also secured $164.9 million of additional funding through a successful equity offering to support delivery of our overall transformation plan and related opportunities. For the quarter, we allocated $63.8 million of capital to profit sustaining and growth projects, including $41.6 million to MSC protein initiatives and approximately $13.1 million towards maintenance, safety and regulatory capital.

Total CapEx as anticipated in the year around $210 million based on current construction schedules, slightly lower than our original guidance. Maintenance capital for the year is expected to be about $35 million as we have increased our focus on high-return projects, supporting our Project 24 initiative with a focus on eliminating unplanned downtime and improving predictive maintenance.

I am pleased to report the partnership realized on adjusted EBITDA of $13.5 million for the quarter, comparing favorably to $13.9 million reported in the prior year when considering the reduction in the minimum volume commitments associated with the sale of both our Hereford and Ord plants. Continued financial performance, coupled with successful refinancing of the partnership's debt under a $60 million 5-year term commitment, enabled the partnership to return value to its shareholders by increasing the quarterly distribution to $0.435 per unit, while maintaining a 1x1 coverage ratio.

For the partnership, distributable cash flow was $11.5 million for the quarter compared to $11.3 million for the same quarter of 2020. Over the last 12 months, adjusted EBITDA was $53.7 million, distributable cash flow was $45.8 million and declared distributions were $18.8 million, resulting in a 2.43x coverage ratio, excluding any adjustment for the required principal payments amortized in the past year.

Now I'd like to turn the call back over to Todd.

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Thanks, Patrich. As I emphasized last quarter, we are in an execution phase now, and commercially, we have been focused on lining up multiple wins in high-value ingredients. Let me walk through each ingredient with you, and I think you will see we are making incredible progress and expect 2022 to be a major transition year for the strategy on multiple fronts. Please forgive me for the amount of information, but this is a really important call for us to outline our progress.

Let me start with Ultra-High Protein ingredients. Based on current construction schedules, we expect over half of our production to be converted sometime in the middle of next year, with Shenandoah fully running and Wood River now making product and coming up to full MSC production capacity. Central City and Mount Vernon are under construction, and we are mobilizing equipment and a team to Obion and expect to break ground there in the next week or 2. Later in 2022, we expect our first turnkey system with Tharaldson Ethanol to come online as well. All of this is possible as we have partnered with Fegan as our EPC contractor, and they are world-class when it comes to these type of projects, all in, company-owned production from protein, including Tharaldson, will be running over 600 million equivalent production gallons with more underway. With that said, construction and engineering remains on pace to complete our platform by 2024, depending on when some of those outstanding permits are obtained in states like Illinois and Minnesota, which could take longer.

Now let's spend some time on our commercial successes and progress around this product. I believe Fluid Quip is the leading technology for protein production in the world from dry milling [corn]. It is the most consistent, most produced, most proven and most accepted today from a quality and consistency standpoint, which matters. We believe it is becoming the standard, and this matters to us, as our quality, digestibility, flowability and consistency make it a very different product than other protein alternatives out there from corn, soy and the rest. This is a very clean protein product that looks the same anywhere we produce it.

We are working in every vertical from pet to aquaculture to swine to dairy and poultry. As we indicated, our early focus was in Pet and Aqua, and we have seen great interest for certain higher value applications in swine as well. I'm happy to announce that we are basically sold out of Shenandoah once again for 2022 into the pet food space, and more importantly, signed a multiyear MOU with increasing volumes through 2023 as our customers want to make sure they have the supply secured. So increasing volumes speaks volumes to the acceptance of our product, and we have several other leading pet food brands that we are in final negotiations for 2022 and 2023 volumes from Wood River as well. Some of this has been an 18-month journey, and it's all around our specific product we produce. You don't just get to call up these customers and say, I have something to sell you. It's very collaborative to a very specific Ultra-High Protein produced using specifically Fluid Quip technology and processing.

We expect success over the next several weeks on these agreements. It's been a bit of a chicken and egg, but they wanted to make sure the new plants are coming online, and we now have redundancy. So everything gets much serious, much more serious very fast. The easiest thing for me to do on this call is just run through our highlights of our protein operations, technology development and commercial activity. We are developing mechanical higher protein separations and believe we have a path of Fluid Quip technology, and this is believed this is possible before we even add biological solutions. We continue to lead innovation and product development to every animal vertical across the globe. We have assembled a dynamic commercial team with deep industry knowledge as well as world-class nutritionists. We are seeing strong and growing interest in our products, which helps solve a variety of nutritional characteristics and challenges, leading to a diverse portfolio of protein ingredients created from the MSC platform.

As part of expanding our diverse portfolio of ingredients, we are successful in running a steady state 27 fermentation run at the end of the quarter, achieving higher protein concentrations at scale, basically full production rates. Our goal of continue at 60% protein and above is in sight, and our next try will be able -- will be to try and achieve this goal early in 2022, alongside our partners from Novozymes. We believe we must focus on minimum 60% protein concentrations, which will be the best outcome for our customers and our shareholders and achieve our intended nutritional and protein targets providing a new ingredient we can utilize in customer development.

In addition to expanding our domestic reach, we are engaged in numerous ongoing discussions with customers in international markets as well. In Wood River, we have been running the MSC system for quite a while, while finishing the dryer upgrade. We saved significant cost by retrofitting the dryer as it is the type required anyways. During that time, we have consistently achieved corn oil yield of 1.2 pounds per bushel or higher. We believe these are some of the highest yields achieved in the industry as Fluid Quip's technology is incredibly expanding corn oil yields, and we believe this is just the beginning, and I'll discuss the impact of this in a bit when I talk about renewable corn oil.

Additionally, we have seen growing interest in our post MSC distillers product, which is a high fiber, high energy ingredient, important to a number of key verticals in its own right. We are negotiating an international distribution agreement in high-value markets in all species and have pending export sales to Asia-based on baseload volumes in agriculture for a certain proprietary outcome that we have found.

Lastly, we have made significant process in aquaculture product development and believe we still have the opportunity to create better tasting, more nutritious aquaculture products and develop new outcomes as we focus on achieving higher than 60% protein concentration. It does go much further than that as we help design rations for higher digestibility, better palatability and better growth achievements all by using our products.

Long term, we believe we will continue to separate ourselves from the commodity markets and deliver high-value specialty designed nutritional solutions to our customers who view the ingredients produced from specifically the Fluid Quip technology to be the standard. This is not just about making protein anymore.

Let's move to renewable corn oil next. Our low CI renewable corn oil platform continues to accelerate along with the benefit of rising vegetable oil prices, and we believe the industry dynamics will continue to support this with planned renewable diesel capacity coming online throughout the next year and beyond. We have proven our platform corn oil yields will increase as our MSC builds come online, leading to greater overall capacity. In addition, our Generation 1 corn yields are pushing to an average of 1 pound per bushel. Our overall corn oil capacity should end the year at approximately GBP330 million, which we believe will increase from there. With vegetable oil prices, $0.30 to $0.40 a pound or more above historical averages and rising, we could see total corn oil contribution exceed $160 million at $0.65 per pound as a baseload next year as well as 100 -- which is well over $100 million more than historical contributions.

We are in multiple discussions on potential strategic corn oil offtake agreements that are ongoing, but we are patient to make sure we strike the right agreement for our shareholders. This is a long game. We don't want to get ahead of ourselves and make a decision too early as we are already getting premiums over soy for our oil as the CI value is starting to be realized in just the normal pricing of our product. We believe we can offer a partners or our partners increased surety of low-carbon intensity supply to participants in the global renewable diesel space, and that is a structure that's beneficial for all parties, which we believe is within reach for our company.

On the clean sugar front, which I believe could be our moonshot opportunities for Green Plains and Green Plains shareholders, our team has continued to make significant progress on improving the operations at the pilot plant at our Innovation Center at York. The initial batch pilot system for CST is fully commissioned and now capable of producing tote scale 95 dextrose equivalent samples and we have produced our first fully refined samples as well. All of the potential customers that receive samples produced at the pilot provided positive comments on performance of sugars tested. The pilot system continues to produce engineering and technical data information needed for full-scale up design. Our initial review of CST sugar is equal to all public specifications. What I think is most exciting is we performed additional carbon intensity analysis, for the unrefined CST product and it netted up to 48% lower carbon intensity compared to wet milled sugar. Lastly, we have a meeting with potential over-the-fence biocampus opportunities with biochemical producers as well as synthetic biology applications. There is a strong commercial interest in co-locating at one of our facilities when we begin to implement a full-scale system in coming years.

So we have covered protein, oil and sugar, and let me say a few words about carbon. We continue our diligence to further invest in the carbon projects around direct injection, commercial use and of course, the pipeline. Obviously, a direct inject site would be our first choice for capital allocation, and we have 3 possibilities, but there's a lot of work to do there. We will update you as we get more results from these studies over the next coming months. We are also -- we are also, first and foremost, a shipper on the Summit Carbon pipeline for our western plants. Secondly, we are a founding investor, and we have seen a potential 4x multiple uplift of that at risk capital based on current valuations. And lastly, we're a founding shipper when we receive an additional uplift over and above our share of carbon credit based on the 45Q tax credit, which could be up to $6 million to $10 million a year as well. The expansion of this credit would be more beneficial to our strategy and investment thesis. More importantly, we need to make sure this allocation of capital is the best use of our funds as we are a shipper in any situation, and we should expect this to compete with other opportunities we are working on.

We are finalizing our comprehensive due diligence process over the next couple of weeks, and I hope you appreciate the depth of our commitment to making the best decision for our shareholders in order to best reduce our carbon intensity of our products. We are encouraged by the proposed carbon credit capture proposals, including expansion -- potential expansion and extension of the 45Q tax credit and the creation of new tax incentives for sustainable aviation fuels, both of which have the potential to be an incredible opportunity for our Green Plains 2.0 platform as we see significant potential in low-carbon ethanol and sustainable low carbon corn oil.

We are in exciting times around the potential for low-carbon ethanol, which now includes alcohol-to-jet opportunities for sustainable aviation fuel, which could be the beginning of rebasing value of our production assets and moving the industry towards a strategic feedstock in what I would call an Ethanol 2.0 environment. We are in exploratory discussions with potential partners ranging from technology, distribution, usage and offtake in sustainable aviation fuel.

To close, I wanted to take an opportunity to walk you through some near-term expectations rather than to continue to only focus on 2024 and beyond. So let's talk about 2022, and I am very optimistic. As discussed, we have several MSC protein projects that are under construction, and we anticipate them coming online by mid-2022. With over 50% of our platform capacity running next year for 2022, we believe the baseline protein platform will have the capacity to contribute somewhere between 40 and $60 million in EBITDA or $0.12 to $0.20 a gallon initially. But remember, we have several for the partial year or even just a few months in 2022.

In specialty alcohols, we still see a premium for our product with our annual capacity for USP as well as industrial B grade and about $65 million -- 65 million gallons. This could contribute an additional incremental $15 million to $25 million over traditional fuel ethanol margins. And on top of that, the contribution for renewable corn oil, and we can make a case of a baseload from these initiatives to deliver between 150 and $200 million in EBITDA in 2022 if the remarket remains at $0.65 or higher per pound, which it absolutely could before considering our base ethanol business without corn oil as we break total corn oil out separate plus other segments less corporate overhead. Our refocus remains on reducing the carbon intensity of all of our sustainable ingredients that matter, capitalizing on the world-class ag tech for our portfolio, we now own with our partners. And most exciting is that we expect to roll out our inaugural sustainability report next month.

With all of that said, thank you for joining our call today, and we look forward to the question-and-answer session.

QUESTIONS AND ANSWERS

Operator

(Operator Instructions) Your first question comes from Adam Samuelson with Goldman Sachs.

Adam L. Samuelson - *Goldman Sachs Group, Inc., Research Division - Equity Analyst*

Todd, a lot of ground was covered there in the prepared remarks. I'd love to dig a little bit more into the carbon opportunity. You talked about it on the script a little bit, but it wasn't much in the press release. And I guess, can you help us think about the key gating factors towards an investment decision around carbon sequestration, specifically on the pipeline, maybe help frame kind of what the potential equity investment could look like. We're waiting for clarity on the infrastructure bill in Congress on the 45Q tax credits? Just help us think about where the key kind of decision items would be there.

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Yes. Thanks, Adam. And look, carbon is a very important part of our strategy and producing low carbon ingredients. Is one of the most important parts of our strategy. So that's first and foremost. So the first thing that we did was we got involved in the initial investor group to fund average capital to get the project started, and we've already seen, based on the first round of potential valuations an uplift from there. The second, obviously, is because we were inaugural shipper, we get a little bit different of an economic share from the tax credit as well, which is also beneficial for our shareholders. That's all without any further investment. So at this point now, what we have is the ability to invest in the full project. And what we have to make sure is that from the standpoint of best returns, it must be beyond an infrastructure return, but we're also motivated to make sure this project also gets built as well. So it's a little bit of a return from a standpoint of what will it return relative to the investment we put in place, but we also want to make sure that we help the project get off the ground and get built and the SCS guys are making incredible progress around securing storage, securing, getting starting to think about right ways, getting things done with the local landowners, and we're watching it very closely, but we also just want to make sure from a diligence standpoint that it's the best use of our capital. But in terms of us wanting to get this project built, we do, and that will be part of our motivation because we believe low carbon intense fuels will have an advantage. And so we're looking very seriously at it, and we'll know and we're kind of going to make our decision in the next couple of weeks. But keep in mind as well, we also have 3 sites in the east that can either have direct inject or other opportunities that we're starting to see develop around use of carbon for other products. And we're looking at that closely as well. And we have to be careful as some of our sites may be on some seismic zones. So we're going to watch that closely to see if there's other uses for the carbon or whether we ship it somewhere else. But we are very highly focused on, number one, the returns we've already achieved by being an early investor. Number two, the fact that we are a shipper on the pipeline as it gets built. And then number three, what is the investment we want to make. And I think in the next couple of weeks, we're going to finalize that decision and just make sure that is the best use of capital for our shareholders.

Adam L. Samuelson - *Goldman Sachs Group, Inc., Research Division - Equity Analyst*

Alright. I appreciate that color. And then if I could follow-up just on the -- on high protein. You talked about consistently getting to 58% in commercial quantities, signed some new MOUs. Can you help us think about how you've achieved pricing on those MOUs and those sales and how those track relative to your kind of framing of the J-curve of value creation at higher protein levels?

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Yes. Thanks. And so initially with our pet food customer, this is a designed product for their application today. So we're going to ship them the same product that we had shipped them last year as well because we're already in their ration, and we're working with them. Now as we know, we can start to achieve higher proteins at scale, what -- when we start to think about 2023, '24 and '25, what's the use for this product? And how will they formulate around it. And so we are still getting a premium to soybean meal. And we're very happy with the results from that. They are consistent with kind of our initial thoughts on what this product is worth. I think where we really want to focus, though, is instead of spending a lot of time between kind of 50% and 60%, in that 56% to 58% range, which we believe we can -- we now have the opportunity as we turn these on to potentially produce at scale. When we see -- set our sights on 60% and above, that's really what makes the difference in terms of the opportunity and getting included in higher-value products around the world. And so we are just taking the view at this point. We want to start to focus on 60% to 62% protein as a baseline product using biological solutions, and we'll know early next year. And if that's the case, then there's really isn't much reason to spend in between 50% and 58% and we might as well just go straight up to the highest -- to the highest point we can. Now where the values will be for that and how long it will take to develop some of those markets, obviously, that will take some time. But once we know we can make that the apt food product, we think that, that's going to be great potential for longer-term and higher returns on these projects. But the first step, even before that is we actually believe the Fluid Quip guys, the Fluid Quip technology can achieve higher mechanical separations, and we're working high on that because, obviously, OpEx versus CapEx is something we would much rather focus on. But our focus is towards the top end of that curve. If there's good markets between 56% and 58%, and we're starting to find those as well, we'll go there, but our goal is to really moonshot our way up to 60-plus as quickly as we can.

Operator

Your next question comes from Jordan Levy with Truist Securities.

Jordan Alexander Levy - *Truist Securities, Inc., Research Division - Research Analyst*

Let me start out asking on turnkey solutions and specifically, Todd, maybe get a sense of how you see that pipeline evolving given its early stages? And also how you think about the market development you spoke -- you gave a lot of detail on in tandem with any additional turnkey agreements?

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Yes. Thanks. So our team is out talking to others that may have interest in these type of projects. I think what we want to make sure -- and I think what we want to do is we choose the right partner and they also choose us as well. And so it's absolutely want to start to focus towards the high end of the plans in terms of best quality, best locations and where we see them fitting nicely into the portfolio. I think not all protein is the same, and I think we're proving that with our product and the inclusions we're getting and the innovation that's happening around it and the quality of it and the flowability and the intended adjustability. I think we're -- people are learning that every single day in terms of what we're able to do, not just the fact our MSC systems, but other MSC systems that are producing today. We are all producing the same product, which is very important around keeping a level idea of what the consumer wants. And so when we look at turnkey solutions, it's absolutely a focus of ours. I think we are going to be successful with others. We have opportunities in front of us, and we're continuing to work those opportunities. Tharaldson will be a great proof point for this industry to understand the opportunity with this product. That's the largest -- one of the largest plants in the industry, and we're putting the technology there, and we're very excited about that. And so we continue to work on more and more partnerships from that perspective. On top of that, then the market development that we're doing around this product is really -- has some incredible opportunities. We're seeing different areas, both domestically and globally, that are interested in this product at multiple different species. It's certainly pet food driven today. It's aquaculture driven as we are working on those as well. But we're also seeing very specific uses in dairy and swine. And even in beef cattle is starting to come up where this is becoming a higher value opportunity for us because it's doing great things for each of those rations specifically and our nutritionists start working with them as well. So look, I think the important thing is in a world of increasing demand for protein and by the way, the world is high protein again and while we've seen some weakness in, obviously, soy meal prices, it's very tight around the world for proteins today, which we think is an opportunity. And it's probably an opportunity for several more years as we don't really see a lot more crushing capacity in soy coming on until kind of late '24 and '25. And so we kind of have a great runway to gain market share with our products. But we're really focused on those higher value, higher protein markets today in terms of developing that. We could sell all the 48, 49, 50, 51 protein, I think, that we produce. And middle of next year, we'll probably be producing 300,000 or 350,000 tons of that. That's not a lot in terms of the total world balance sheet. But what it is a lot of is a very high value product, and that's kind of what we're most excited about. So our market development has made great strides this quarter. We signed MOU for multiyear offtakes of this product. We have others that are in negotiation now for use of this product because the key is -- the key here is that they want to make sure that they have the supply because once Shenandoah was sold out, there's no more supply. Once Wood River sold out, there's no more supply. So there's really kind of limited supply of this product at the end of the day, and it's a very high-quality product replacement that can achieve great things. And so locking in these agreements is guaranteeing supply. And ultimately, we're going to be sold out of this platform.

Jordan Alexander Levy - *Truist Securities, Inc., Research Division - Research Analyst*

That's great detail. And maybe just as a follow-up to that, maybe if we take a step back and look higher level, bigger picture longer-term at the potential of the platform, what you've got, MSC online, and you start to look into CST and that sort of thing. I'm curious if you could just talk to how you see longer-term potential to drive synergies in the market development work you're doing once you evolve into the kind of the next phase of this transformation plan in terms of high-value ingredients?

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Well, when we look at kind of protein oil and sugar, I mean, those are the 3 main high value opportunities, but protein is a baseline ingredient for many other opportunities around value-added agreements in the yeast, in the fiber. People are calling us. Customers are calling us now for our fiber products that are stemming off of the protein product. They're calling for yeast applications that are stemming off of the protein product. We're having -- we're just scratching the surface on that opportunity because the easiest thing for everybody to understand is protein concentration. So that's the thing that we've talked about. It's much harder when you talk about wealth. There's also value in the yeast. There's also value in the fiber, and there's also other uses of this product, and we're developing different technologies around this product. That's a little bit harder to explain, but that's really where the money -- the real money is going to be made in diversifying our ingredient opportunity because it's not just, again, protein is a good metric, but it's really not just a protein strategy. It's really a fully value-added ingredient strategy. When you layer on top of that, the opportunity that we can make 95 DE or dextrose equivalent of products that compete both financially and product-wise at we think better economics than what's being made today in markets that need more and more products, we're seeing great interest in potential partners that want to do over-the-fence opportunities, much like you see at other companies that produce dextrose because there's just not enough availability left in the market today. So we're accelerating that opportunity. We're even getting called in for people that want to buy the clean sugar technology, and we say we're really not ready to sell it yet either. We're going to use it here first at Green Plains and if the market develops long term, which we think it can, potentially, that could be another opportunity for everybody. But if you just take a look at one really interesting market, if you just take a look at the global glycol market and you say, if you can convert that to a bio glycol coming off of dextrose as your main feed -- as a feedstock and moving to bio glycol, that market is big enough that if you converted every single ethanol plant in the United States to dextrose, you still would only have 20% to 30% of the market covered for a bio glycol type of product. So the markets are so big in sugar opportunities, in chemical opportunities that you may never even have to worry about food applications going forward. And on top of that, we're working with potential partners that have synthetic biology applications that have used our products and have said that they've gotten better results from our unrefined clean sugar -- our unrefined clean sugar product versus a fully refined food-grade product because of what's left in there that's giving them opportunities as well. And if you take a look at the world around synthetic biology, it all starts with sugar. So we're all very excited about that as well. On top of that, I mean, how do you not look at our vegetable oil opportunity that we have. When we start 2022 with all of our plants running close to 1.0 yields and our MSC plants pushing towards 1.2 to 1.4 pounds per bushel of oil and you think about the fact that we're already getting a premium to soy eating into some of the low carbon advantage that this oil has. On top of that, when you look at the fact that you really won't bring on a lot more oil, veg oil capacity until '24 and '25. We're sitting here in a great place as you look at the reduction in canola oils for next year and the loss of canola oil because of the Canadian drought. There's a chance that we start to see numbers towards with a 7 in front of it and 8 in front of it next year in the vegetable oil market, which is just a wonderful opportunity for Green Plains shareholders as a starting point. So we can be very -- our view is we need to be very patient and not sign too early because this is just starting. There's a need for 20-plus soybean crushing plants to be built in the United States just to handle some of the renewable diesel demand. Now on top of that, we're still a significantly lower carbon intense oil, which even adds to a better opportunity. So we view our strategic location in this opportunity to be very valuable for our shareholders, and we're going to do everything we can to make the best decision to monetize that opportunity for them.

Operator

Your next question comes from Ben Bienvenu.

Benjamin Shelton Bienvenu - *Stephens Inc., Research Division - MD & Analyst*

I want to follow-up on Adam's question about carbon sequestration. But as it relates to the long-term opportunity around SAF. And I'm curious, just when you think about the equation of making ethanol low CI ethanol a competitive feedstock for the SAF opportunity, which as you noted, is really, really big. How important is that in the equation, getting that CI score down to make it competitive with veg oils, kind of irrespective of the fact that there's going to be a lot more availability of ethanol as a feedstock versus vegetable oils, which are likely to get sucked up by the renewable diesel production demand?

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Yes. So we think when you take a look at the need for sustainable aviation fuel and the demand for it, you're only going to go so far with kind of the renewable diesel to SAF. And the rest, we believe, is most likely an alcohol-to-jet opportunity. And remember, for a gallon or so of ethanol, you're really only going to get 0.6 gallons of sustainable aviation fuel, which is why the tax credit needs to be so high in terms of when you're looking at $1.50, $2, $3 a gallon, it's because, number one, you're going to lose volumes. But number two, being on pipelines, obviously, is something that's going to be important -- or a question in your carbon direct inject, other areas that you can sequester carbon is a key component to sustainable aviation fuels because you do have to start out with a lower carbon intense liquid fuel before conversion. So that's kind of a motivation. One thing you got to be careful is you may not be able to double dip in terms of the 45Q and the aviation fuel credit. So you're going to -- you might have to pick one of those. But if you have a low-carbon intense alcohol, that's a great starting point. We are absolutely looking at this opportunity. We are in discussions with potential partners, not just only for the technology side and exploring different technologies that are available, but also, you should be in discussions with distribution assets. You should be in discussion with demand for the product. You should be in discussion for how you move the product to market as well. And so it's just -- it's not just announcing a technology, which I think are still -- there's still a lot of fluidity around which technology to choose, and there's several out there, and there's probably more coming, quite frankly. So we have a little -- we got to see how this build back better, build ends up here with sustainable aviation fuel seems to be what I think is probably one of the growing opportunities for U.S. ethanol, the industry in total, that we have not really seen before where you could possibly rebase these assets as a strategic fuel for the use in sustainable aviation. Most interesting is, let's just say, it's a $4 billion gallon type opportunity where you probably need 6 billion gallons of ethanol to get there. And if you took 6 billion gallons of ethanol in a market that is using ethanol as an octane blend and a low-carbon blend, it could be really interesting to this industry and to this company and for our shareholders as all of this takes place. So we have absolutely put resources in place to start to look at this opportunity. And I think we'll have more updates each quarter as we go on.

Benjamin Shelton Bienvenu - *Stephens Inc., Research Division - MD & Analyst*

My second question is clarifying your commentary on 2022 kind of the EBITDA build that you offered. And I think it's clear you guys are on the runway to the long-term EBITDA kind of baseline potential of the organization. So the timing is less important relative to the big picture. But I just want to understand if I heard what you said. Are you saying between MSC, USP and corn oil, at the midpoint, you're thinking $245 million of EBITDA plus whatever contribution you would get from agribusiness and the partnership and the baseline ethanol business, did I hear that right, or is that run rate commentary that you offered?

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

No. I mean what we said is, yes, look, we are -- we believe we're on the path to 2024. Let's just -- and that's what we're focused on, 100%. But we would be remiss not to at least discuss what the 2022 opportunity is based on the current markets. So we're basing it on current vegetable oil pricing. With vegetable oil pricing at $0.65 a pound as a baseload, which is well over $100 million over our historical contributions, that could be in that $150 million, $160 million, just gross range after deduction of our -- after deduction of our loss in terms of distillers grains. But it's outside of the -- let's just say we leave the ethanol margin alone with no contribution from corn oil. That's the number that could be the 2022 contribution at $0.65 a pound. And if it goes up, obviously, every $0.10 a pound is about $30 million more than that. So obviously, we'll watch the vegetable oil pricing very, very closely. On top of that then, when you take a look at what we will have running in 2022, it will be 200 million gallons equivalent of protein for the full year. And then as we bring on another 360 million gallons from our own system for about half the year, depending on when Obion, Mount Vernon and Central City start up and then obviously, Tharaldson will be later in the year, maybe get a couple of months out of that, but it will be during start-up, just baseline, $40 million to $60 million is kind of how we're thinking about 2022 first real contribution from protein. And again, I think it's good for people to understand that this is not just any protein product. If we look of MSC product, it's a very unique product, made different. It's produced differently and it's used differently, and it's thought about differently. And so we think somewhere between 40 and $60 million. And then we'll just have to wait and see where especially the alcohol markets come in. The B grade market is hanging in there. The USP market got a little bit weaker, probably in that $20 million to $30 million range for 2022 contribution. On top of that, our normal contribution from Ag and energy will probably come in line. There's what we might -- we're looking at, should that stand-alone or should that be part of the corn processing segment. So that could be an add-on and then obviously, we take off our SG&A from there. So it's a good starting point to think about that but I think what it does is it tells you, with ethanol 0 baseline, which right now we know it's not, that's just the baseline opportunity for the company based on everything we've done. Lastly, and I know it's a long answer. We started out the whole corn oil discussion, our yields were 0.7 as an industry. And now Green Plains were pushing kind of 1.0 without MSC and Fluid Quip opportunities. And you good to see that's just a big opportunity at these higher oil prices, which, in our view, is a multiyear opportunity and strategic to our shareholders.

Benjamin Shelton Bienvenu - *Stephens Inc., Research Division - MD & Analyst*

I really, really appreciate the commentary. It's helpful. Congrats and best a lot.

Operator

Your next question comes from Manav Gupta with Credit Suisse.

Manav Gupta - *Crédit Suisse AG, Research Division - Research Analyst*

My first question is, clearly, you have renewable corn oil, which is highly, highly desired. And there are people out there who have been able to get deals on soybean oil. So your deal theoretically should be a lot more valuable. And what I'm trying to understand, sir, here is there are 2 kinds of deals being offered, where, one, where the renewable diesel producer comes in offers the feedstock guy a good amount of money even to develop his resources and then kind of there's a profit-sharing agreement. But there's another kind of deal being offered by some of the newer guys who are basically saying the feedstock guy has to bring in the capital, and then we will kind of do a deal, which in a way would make you a partial owner of a renewable diesel facility. And I'm trying to understand are you open to both kinds of deals? Or you'll be more open to the first kind of deal where you don't have to put in the capital and become an owner of a renewable diesel facility?

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Yes. We're focused on the first idea that you've discussed. But beyond that, we think if somebody wants to secure our corn oil for long-term offtakes or long-term security of supply, that, number one, we believe there is a profit share opportunity out there. Remember, right off the bat from a CI perspective, we believe that renewable corn oil, it should trade at about $0.10 in premium over soybean oil. And we haven't seen a trade that high, but we have seen $0.05 to $0.07 a pound premiums being paid already. So if we would have made a deal early, we might not have actually had that benefit of the CI uplift just from the market. So we're -- we know what we have. Remember, if you take a look at the top 4 players in our space, you make a -- altogether make the most amount of corn oil together one has committed -- well, one already owns renewable diesel. One, obviously, we've seen them commit to some partnerships already in terms of committing some vegetable oils. The other, we haven't heard much from and then we have ourselves. And so there's a lot of oil at the top of the food chain here, and it's all very, very valuable because of the CI, the carbon intensity reduction that corn oil brings versus soybean oil, number one. Number two, it's a waste of all that food oil and the headlines right now on food oils, I would say, are moving a little bit negative in terms of looking at food prices and the articles around there while leaving waste oils out of it. So I think we're just in a good place. I don't think we need to own renewable diesel assets, quite frankly. That's we are -- I think we're in a great position from the standpoint of having the feedstock. And I think we're going to be able to take advantage of that for our shareholders. I think we are in a great position and we'll see what transpires. But I don't think you want to rush to make a conclusion just yet because I think there's some very interesting opportunities around monetization of our corn oil. And I think if you rush into it too much, you might have -- you might make the wrong decision, especially that the market is already trading over soybean oil several times last year or this year.

Manav Gupta - *Crédit Suisse AG, Research Division - Research Analyst*

No, I agree with you. You should not be in the business of owning renewable diesel facility. I was just trying to make a clarification. The second question, which you mentioned about these bills, which are coming up. It finally appears that even though until 2026, everybody gets a blenders tax credit. But after that, the way the language is structured, it's looking like even EPA or RFS is moving towards lower carbon intensity fuels and it's incentivizing you to actually take into consideration carbon intensity even for something like a blender's tax credit. So I'm just trying to understand, in your view, when you look at these regulations as they are coming in, are we moving in a direction where, in a way, we can say we will have a national low carbon fuel standard mandate at some point where carbon intensity would definitely -- or would be taken into consideration in a much more meaningful way because right now, if you look at RFS, pretty much, it doesn't take into consideration the carbon intensity at all.

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

I think we're trending in a direction that everything will be based around your carbon intensity. What the final program looks like, it's hard to say. And whether you can qualify for all of the credits available or if you have to pick and choose, we have to also watch that carefully. So if you make the wrong decision too early, you might be opting out of the program that you want to be in. So you have to take off until we see the final language around that. I think you need to be careful on which path you choose because it's not an all for one solution. You might have to pick and choose where you want to go and earn your opportunity in low carbon. But I agree with your comment, we are moving into a low-carbon standard of some sort. But again, hard, at $85 a ton, 45Q tax credit, just keep this in mind, everything works. So your project needs to stand on the tax -- the 45Q first because I think the value of carbon is something we have to figure out what is that going to be long-term because at $85 everything works. And so -- but that doesn't mean that there aren't great opportunities around lowering your carbon intensity but also having the opportunity around sustainable aviation or low carbon ethanol or a combination of both on top of low-carbon corn oil, on top of low-carbon ingredients. And I think we're already seeing -- we are beyond low carbon fuels, we are already getting asked, can you give us a low-carbon ingredient centered around our Ultra-High protein, but with added nutritional characteristics. We're getting asked that already is we're going to put carbon intensity in the bag of our feed, and can you help us with that? And that's a whole other opportunity around our ingredient platform, especially by being low carbon. So it's a bunch of different ways that you could think about this. I would only caution you don't want to make the wrong decision too early because there's a lot of moving pieces.

Operator

Your next question comes from Eric Stine with Craig-Hallum.

Eric Andrew Stine - *Craig-Hallum Capital Group LLC, Research Division - Senior Research Analyst*

Just wanted to sneak one in here at the end. You obviously, great that you have signed the -- you mentioned multiyear MOU for sales in the pet foods for 2023, and I know you are certainly targeting more sales or contracts in 2022. But just from a high level, how do you think about kind of balancing the fact that it would be great to get those under contract. But as you said, you're also working more to that 60% plus type of level. So maybe just balancing what the margin outlook could be at those higher percentages versus locking things in early for 2022.

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Yes. That's a great question. But I think the key here is, once you're in the ration, especially in a consumer product, the goal is to stay in the ration. We've been able to do this now. That will be our third and our fourth year that we're able to stay in the ration. And I think once you do that, these are 10, 20-year relationships and so by even getting multiyear MOUs to stay in the ration and talk about increasing volumes, what they want to be able to do is secure value. Our customers want to be able to secure volumes, so they have something to buy. And I think that's the key for what we're trying to accomplish here is lock in volumes without, but also in each of our MOUs that we are -- either have or negotiating within their -- in each of these, we discussed the opportunity of increased protein concentrations or increasing nutritional outcomes and leaving those open for negotiation because like you said, I don't -- again, like we talked about in corn oil, like we talked about in carbon and like we talked about in sustainable aviation, you don't want to lock it away too early because there's a lot of other opportunities that might come into play, like low carbon ingredients into Europe or like ingredients into Asia aquaculture. And again, there could be a point where there just won't be enough of this product around because it's a very distinctly different product than maybe others -- the MSC Fluid Quip product is a very distinctly different product than alternatives that are available out there. And I think that's really important. So getting a multiyear MOU out in pet food is almost unheard of from an ingredient standpoint. And it just shows -- showing their commitment that they want to commit to the quantities today, and we can work on pricing and protein concentrations and nutritional characteristics later.

Eric Andrew Stine - *Craig-Hallum Capital Group LLC, Research Division - Senior Research Analyst*

Got it. And I guess that would speak to what you'd said earlier just it is collaborative. As you said, you don't just call someone up and say, Hey, I've got a product for you. This would be something where you could sign a contract and expand from there.

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Well, you can call somebody up and say they have that, but then you're going to get commodity pricing. And it's not the same product. So we are working with them on very specific tailored products using the MSC as the starting point, but we are discussing tailoring these products to their use, which is very different than just making some protein. And that's the uniqueness of our product because of the yeast component in it as well as the opportunity around low carbon.

Operator

Your next question comes from Ken Zaslow with Bank of Montreal.

Kenneth Bryan Zaslow - *BMO Capital Markets Equity Research - MD of Food & Agribusiness Research and Food & Beverage Analyst*

Two questions. One is, can you remind us -- I don't know if you said Shenandoah, what were the margins there? And how much were they above the rest of the company? Could you give us some context?

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Yes. I mean, like we indicated earlier, the initial margins at Shenandoah were $0.12 to $0.20 a gallon, and they continue to hold. And so when we look at that relative to contributions, it's starting to contribute potentially $0.01 to $0.02 a gallon overall to our total platform because it's only 8% of our total -- less than 8% of our total production, but we're very happy with the results. We're very happy with product quality. Happy with the corn oil yields because, obviously, at $1.1 to $1.2 pounds per bushel corn oil yield at Shenandoah was $0.65 a pound. That helps the overall margin for the protein systems. And so net, they're holding steady and we're looking to grow them.

Kenneth Bryan Zaslow - *BMO Capital Markets Equity Research - MD of Food & Agribusiness Research and Food & Beverage Analyst*

The second question I had, look, I'm looking at your slide where you have the 2020 quarter run rate EBITDA. When you take those pieces apart, do you think you're tracking in line above or below those numbers. And then when I look at the renewable corn oil, I think your thought is that you're going to have capacity about almost 400 million gallons, you're at 330. Are you looking to [plant] that as well?

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Yes. I mean we're going to -- we'll continue to relook at the opportunity in 2024. Obviously, there's moving pieces. Some things are increasing, some things are decreasing. You got to make sure that they stand up a clean sugar system between now and then. Obviously, the renewable corn oil at $0.65 a pound and potentially higher through 2024 is an adder. We've seen some contraction in the specialty alcohol margin, which would be a decrease. But then if we can achieve 60 protein and higher and nutritional outcomes that are beneficial for our -- and using innovation and technology around this product hopefully, the sustainable high-protein gives us higher numbers than that. So again, we're not going to give the full guidance update yet, but I think you've got enough information from this call to start to think about what the opportunity is in 2024. Obviously, execution, execution, execution. We think that we will have half our systems converted by middle of next year. We have the equipment coming in. It's been ordered. So even with this global supply chain, have we seen some stuff get bogged down? Yes, we have. But I think we're still good and on track for mid-2022. And we just take the rest of that time to roll out the rest of our platform and finish the [rest]. So I think we've given enough information to at least rethinking the distribution of 2024. But I think at this point, you can say we're holding steady on our thoughts from the opportunity in 2024 as a starting point.

Operator

Alright. We don't have any other further questions. I'll hand the call back to Todd Becker.

Todd A. Becker - *Green Plains Inc. - President, CEO & Director*

Yes. Thanks, everybody, for coming on the call today. Obviously, as we mentioned, we're making incredible progress around our transformation. It's a very big opportunity for our company and our shareholders. Notwithstanding, there's still volatility in the underlying business that we're -- the legacy business that we're focused on. Year-to-date, really happy about the results. Obviously, some movement between quarters. Q4 shaping up to be a pretty interesting finish for the end of the year for the industry in total. But I think on top of that, the success that we're seeing around our product, product development, opportunities, innovation, technology and customer needs and wants and interest is really setting us up well to deliver what we think will be a transition, great transition opportunity in 2022 with the full transformation still ended up -- ending in 2024. And we think it's -- we think we're in really good shape as we kind of approach the next quarter in the next year and a year or 2. So thanks for your support, and we'll see you next quarter. Appreciate it.

Operator

Ladies and gentlemen, that concludes today's conference. Thank you all for joining. You may now disconnect.