



# RED RIVER BIOREFINERY

NDIC OVERVIEW

2021



# RRB Background

- The Red River Biorefinery (“RRB”) is a 16.5 million gallon per year ethanol facility located in Grand Fork, North Dakota
- RRB produces fuel and pharmaceutical grade ethanol from agricultural byproducts and food processing waste. RRB’s use of waste feedstocks and the facility’s processing design enable the production of ethanol with one of the lowest carbon footprints in the US
- Currently supplying product to United States, Canada, and Mexico and in process of registering for import into Switzerland and EU for low carbon fuel sales
- First piece in a long-term vision for an integrated, low carbon, diversified value-added ag processing campus with initial investment of \$150MM (USD)
- Financed via long-term municipal bond and equity investment from Ultra Capital
- Suppliers of Feedstock include the following



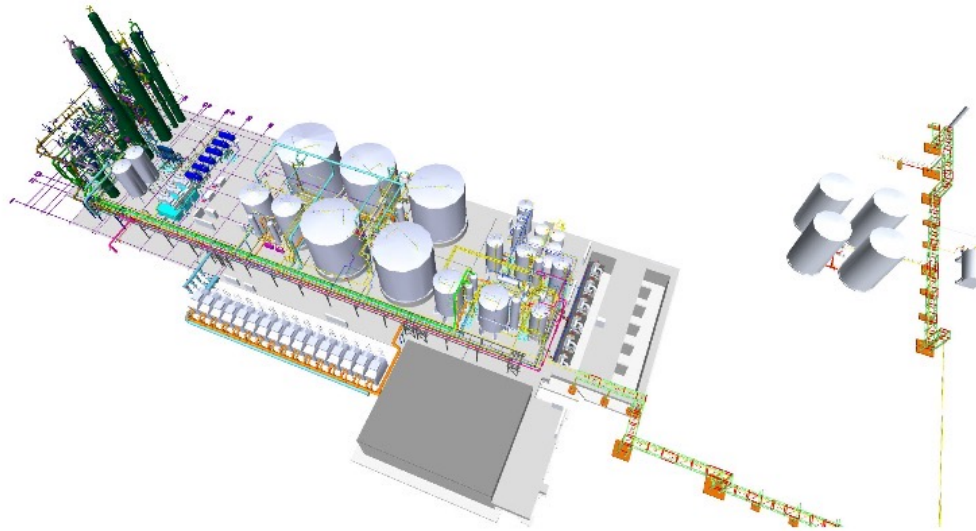


# RRB Site Overview



Promotional Video: <https://vimeo.com/494180038/0e71a765c8>

Website: [www.redriverbiorefinery.com](http://www.redriverbiorefinery.com)





# Keshav Rajpal Background

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- Lead developer and President of the Red River Biorefinery in Grand Forks, ND
- Developed the concept, contracted long term feed-stock and off-take agreements, structured the project and built the facility over a 6-year period
- Currently leading all commercial activities for RRB in addition to additional project development
- Built deep relationships and partnerships across the US, Europe and Asia with leading suppliers and companies in the low carbon economy
- 25 years of operational experience in various roles with large management consulting firm and Fortune 500 company
- Undergraduate degree in Mechanical Engineering from University of Wisconsin – Madison and MBA from the Northwestern Kellogg School of Business



# Ag Sector is Pivotal to De-Carbonization

- The global trend to de-carbonize food, fuel and materials is underway
  - Plant-based protein is displacing traditional animal-based meat due to the lowering production costs and awareness of the water/energy/carbon footprint associated with animal protein
  - Bio-energy products (ethanol, renewable natural gas, biomass power) displacing fossil fuels across various markets
  - Consumer recognition of carbon footprint resulting in change to material and chemical supply chain procurement
- Further advancement of certain policy and regulations will benefit producers of zero/low carbon products
  - Existing policies already generating high value for certain forward-thinking producers
  - Investment opportunity exists even without further policy action but provides additional upside potential
- De-carbonization can be achieved through the deployment of demonstrated, lower-risk agricultural processing facilities that convert conventional agricultural inputs into high-value end products
- This trend provides new market demand and incremental value for farmers and producers looking to find new, reliable and firm outlets for their production

Advanced agricultural processing can be a major contributor to displacing and de-carbonizing the food, energy and chemical sectors



# Development Plan Investment Thesis

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Transition in consumer demands and agricultural innovation presents a unique opportunity for the Grand Forks region



RRB experience allows for optimized design and operations that others are not able to replicate



Carbon management is critical to long-term competitiveness and a differentiator in many markets



Smaller scale distributed production provides greater value and economic security to local economies



Implementation of proven technologies provides a low-risk deployment strategy



Co-located facilities enhances operating efficiencies and increases overall financial returns



Focus on disciplined business model with long-term contracts with risk and reward sharing aligns partners



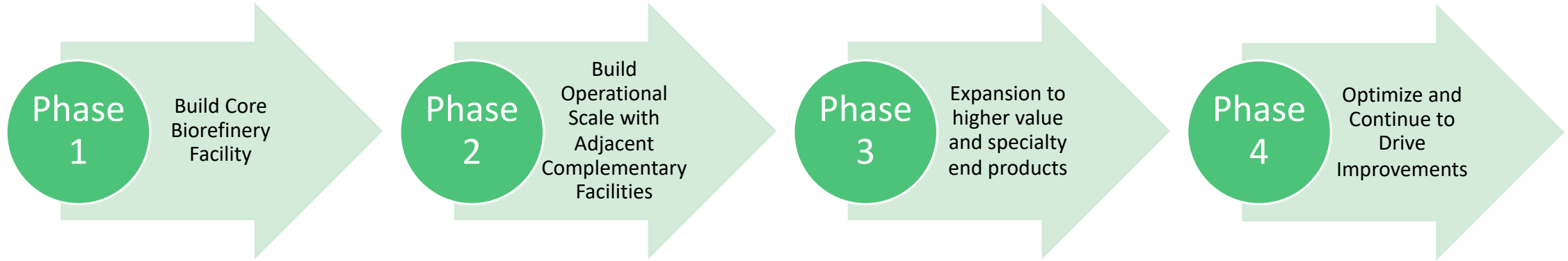
# Development Path Forward

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- Increase enterprise value to value added ag processing business by building adjacent facilities with synergies and shared infrastructure focused on low carbon production
- Low carbon and high value agricultural processing facilities (wheat refining, plant protein)
  - Feedstock supply from adjacent facilities can provide over 85% of RRB's production capacity and increases margins lower CI for RRB (e.g. No transportation, no front-end processing, minimal feedstock costs)
- Creates a new integrated scalable business model for profitable growth in the low carbon bioeconomy
- Reference facility in Poland currently executing similar strategy successfully (White Energy in Russel KS has a wheat gluten facility)



# Grand Forks Ag-Park Strategy



## Timing

Complete

In Progress  
2021-2024

2023-2025

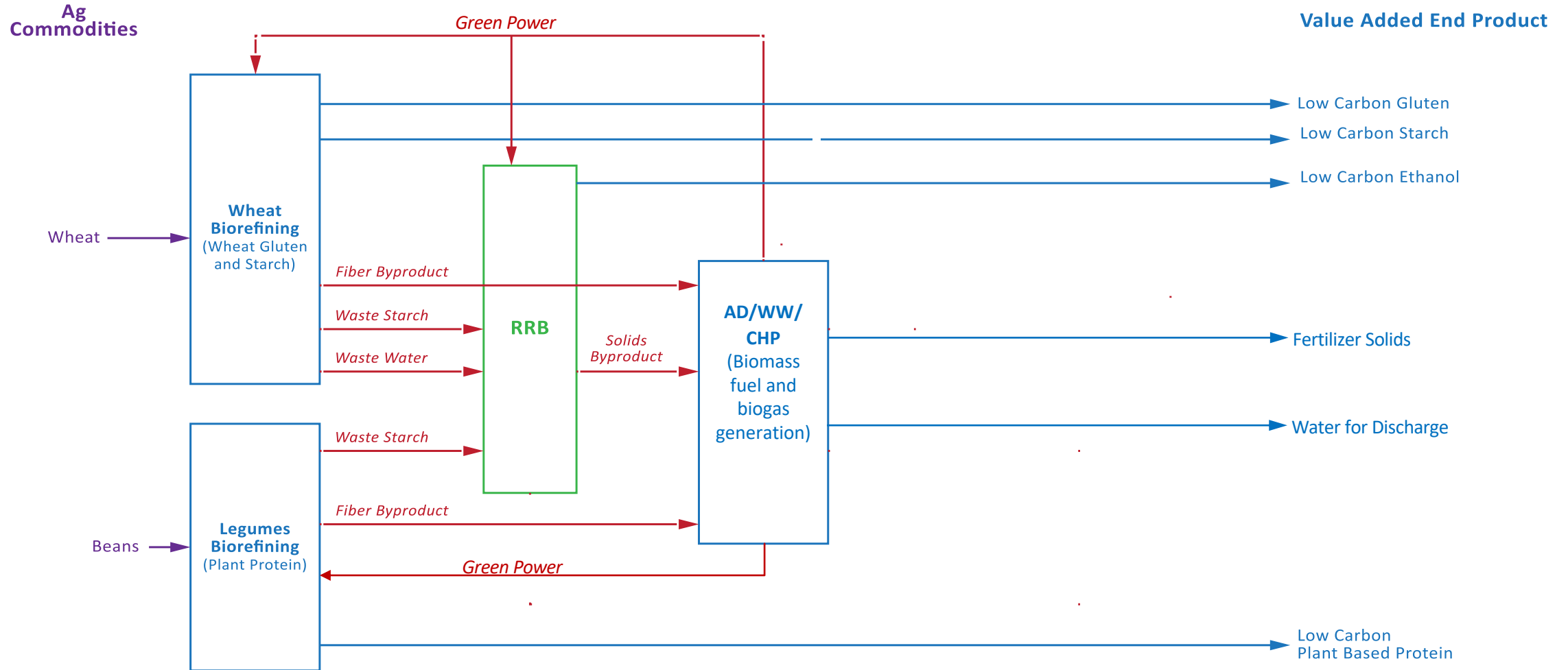
2021-On-going

## Scope

- 16.5MM gallon Biorefinery to produce transportation and USP grade ethanol
- Wheat processing facility to produce gluten and A Starch
- Plant Protein facility to produce protein
- Digester/Biomass CHP/Waste-water treatment to support Ag-park with green energy and produce renewable natural gas
- Realize synergies with RRB
- Fine chemicals production based on outputs from phase 2
- Animal feed production from solids by-product
- Soil amendment production from solids and liquid byproduct
- Greenhouse integrated with CO2, water and solids from the other facilities
- Focus on operations optimization to improve overall efficiency of the park
- Maximize carbon tracking and credits management across portfolio
- Balance production of end-products from variety of inputs with the best end market opportunities
- Leverage commercial partnerships and relationships to develop additional projects and/or facilities



# Grand Forks Green Ag-Park Phase 2





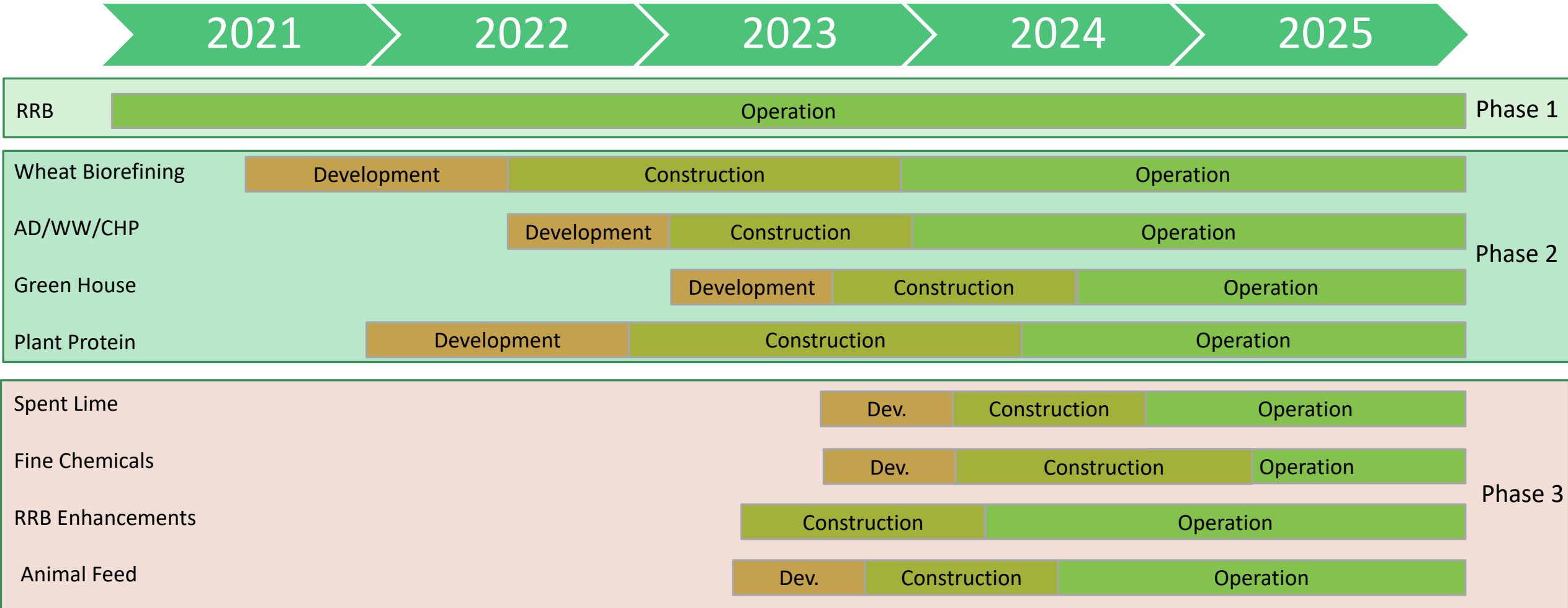
# Ag Park Capital Need

Phase	Project	Estimated Project Cost (\$MM)	Estimated Development Cost (MM)	Estimated Direct Jobs (FT)	Comments
2	Wheat Biorefining	\$152	\$7	55	Process wheat into gluten and A starch
2	Anaerobic Digester / Waste Water / CHP	\$273	\$13	50	Anerobic digester, waste water treatment with biogas generation and clean-up, and biomass based CHP to power the entire ag-park
2	Plant Based Protein	\$90	\$4	55	Growing market - samples are currently in review with customers for evaluation.
<b>Phase 2</b>		<b>~\$515MM</b>	<b>~\$22MM</b>	<b>160</b>	
3	Greenhouse / Processing Facility	\$46	\$2	40	Using waste heat, CO2, water, and solids from different operations provides low cost greenhouse operations with low carbon footprint for growing high value crops.
3	Spent Lime Pelletizing	\$25	\$1.5	20	Pilot process has been completed and contract in place with ACS. Working on market approach and facility design.
3	Fine Chemicals	\$30	\$2.5	20	Production of biobased chemicals (e.g. Hyaluronic Acid, PLA)
3	RRB Enhancements	\$30	\$2.0	20	Increase throughput and improve to potable grade based on integration
3	Animal Feed	\$25	\$1.5	20	Combination of different product byproducts dried and pelletized for feed market
<b>Phase 3</b>		<b>~\$156MM</b>	<b>~9.5\$MM</b>	<b>~80</b>	
<b>Total</b>		<b>~\$671MM</b>	<b>\$33.5MM</b>	<b>280</b>	

These processes can be further developed (products of these units can be feedstock for future processes) generating new, novel and innovative products



# Ag-Park Projects Timeline





# Wheat Biorefinery Project

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- Process is being modeled after existing facility in Europe with existing integration to the RRB reference facility
- Process 1200 MT/Day (~300,000 acres of crop) of Wheat into 2 primary products for the food/feed market:
  - Gluten (100 MT/Day)
  - A Starch (550 MT/Day)
- By-product to be processed at RRB for conversion to ethanol and biogas
- Initial analysis for project has been completed to prepare for a more complete feasibility study consisting of:
  - Site acquisition – Location is available, zoned, and suitable for the project
  - Capital cost based on high level process design and supplier quotes
  - Off-take agreements – In discussions with several buyers of product
  - Feedstock analysis and acquisition plan – Initial discussions completed with suppliers
  - Completed an integrated mass and energy balance for the phase 2 Ag Park elements
  - Initial site layout for the entire park (Phase 1-3)
  - Working with the city on infrastructure planning (Water, Roads, etc.)



# Wheat Biorefinery Feasibility Study Scope

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- Facility design book (Block diagrams, supplier lists, etc.)
- Site layout and logistics plan
- Permitting plan (Site and Facility)
- Detailed acquisition plan
- Off-take Letters of Intent (LOIs) for end products (gluten, A starch and byproducts)
- Robust financial model to be used for project financing
- EPC contract outline
- Project timeline
- Operational plan



# Project Financing Options

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- RRB equity financed by Ultra Capital, a sustainable infrastructure private investment firm based in Philadelphia, PA
  - Ultra Capital will continue to support the expansion and development adjacent to RRB, in addition to supporting additional capital needs to fund the growth of the business
- A number of development capital funding programs are currently being procured through partnership with the State of North Dakota, in addition to potential development capital funding from Ultra Capital
- Debt financing options are likely to be available to fund construction and long-term operations, including from private sources (municipal bond market, bank debt, private lenders) as well as governmental (US Dept. of Energy Loan Program, US Dept. of Agriculture, State of North Dakota)
- Discussions with potential financing partners who can support the capital need and growth of the business are ongoing
- We anticipate initial major capital / construction financing to be raised in early 2022 for phase 2