Global climate change is presenting significant and critical challenges to our planet, our economies and our future. Agriculture is responsible for 30% of global, greenhouse gas emissions. Due to Bayer’s position in the agricultural industry, Bayer is uniquely positioned to be a leading force in agriculture decarbonization. The Bayer Carbon Initiative, started in July 2020, has focused on carbon markets, value-add models for customers, the creation of low carbon products, processes and practices to aid farmers in producing more food with a lower greenhouse gas footprint. The question is, as the agriculture crop input leader, what are the best strategies and models for Bayer to explore and be the winner in sustainable agriculture?

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I. The environmental impact of agriculture and the challenges for carbon mitigation in Agriculture.

As reported by McKinsey in 2020 and 2021, Agriculture is a leading contributor to climate change. Cattle production and deforestation are the key drivers in Agriculture’s impact on the environment being responsible for nearly 30% of greenhouse gases (GHG). A particularly potent greenhouse gas, methane is a byproduct of many agricultural practices including enteric fermentation by ruminants (cattle and sheep), rice cultivation and manure management. Large players in the value chain for meat production have explored more environmentally friendly practices to limit the impact of meat consumption. For example, global producers like McDonald’s and Tyson as well as the European Union are exploring both plant-based products and more sustainable production practices.

As a leading producer of GHG, Agriculture can have a significant impact on reduction in GHG and progress toward meeting the Paris Climate Accord’s goal of a limiting the increase in global temperature rise by 2 degrees Celsius above pre-industrial levels with an ambitious goal of limiting the rise to 1.5 degrees Celsius. Changes in Agriculture could result in about 20% of the emission reductions needed by 2050.

Four major shifts in Agriculture and food production are needed to reach the 1.5-degree goal.

1) The Agricultural supply chain needs to move toward more efficient food production.

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2) There needs to be a significant shift in consumer demand away from meat consumption, a reduction in food waste (it is estimated that 30% of produced food is wasted) and an emphasis on shorter distances between producer and consumer is needed.

3) A change in national-level land use policies related to Agriculture and carbon sequestration is required.

4) The maturation and expansion of the functioning carbon markets related to Agricultural production and agricultural land use practices are needed.

However; those shifts come with significant challenges. Namely, billions of farmers need to be engaged and incentivized. New technological advances need to reach the small farms (less than 2 hectares) which represent 75% of the global farms. Additionally, billions of consumers’ behavior will need to be changed. Perhaps the most daunting challenge to Agriculture being part of the solution is that direct GHG emissions from beef and dairy cattle are larger than any single country’s emissions and there is currently not a solution to that challenge.

Intricately connected to the reduction of GHG is the reduction and sequestration of carbon and the market for carbon credits. As reported by McKinsey, carbon credits allow institutions to trade one carbon producer’s carbon for a reduction by another institution’s lack of carbon production. This offset encourages and compensates those who can reduce carbon to do so and counteracts the inability of others to reduce their carbon production. The goals of the carbon credit markets are to avoid, reduce and sequester carbon across industries. The Agricultural sector could have a significant, positive impact on carbon emissions through an efficient carbon trading market.
However, inefficiencies in the “cap and trade” functions of the market have prevented this strategy from reaching its full potential. For carbon credits to be an effective tool for GHG reductions, projects have to be well-designed, funded, developed, operated and policed. Those inefficiencies are significant.

Adding to the inefficiencies in the carbon market are structural challenges related to the difficulty in operating in countries with attractive carbon reduction options, the complexity in methods and governance and the risk factors for farmers to engage in carbon trading. Despite these challenges and inefficiencies, McKinsey estimates that in 2020, buyers retired carbon credits for some 95 million tons of carbon-dioxide equivalent (MtCO2e), which would be more than twice as much as in 2017\(^2\). And the demand continues to grow with four consecutive years of record growth in the carbon trading market.

In order to reach the scale needed for effective carbon reduction and sequestration, carbon credits need to be clearly defined and verified. Contracts with clearly defined terms, conditions and standards need to be developed. A consensus on the use of credits as well as a reliable trading infrastructure need to be created. Additionally reliable mechanisms to safeguard and verify the carbon trading market need to be established. Also, for farmers to be enticed to participate in the market, the efficient signaling of demand will be necessary.

II. Bayer’s leadership role in this market³

As a firm that has as its mission, “Science For A Better Life”⁴, Bayer approaches the environmental impact of agriculture as both a responsibility and an opportunity. Dedicated to “improving the health of humans, animals and plants” the Leadership of the Bayer Carbon Initiative sees the impacts to global climate changes and the potential mitigating role of agricultural products and processes in the emissions contributing to climate change as integral to Bayer’s global mission and values. The four pillars of the mission are Leadership, Integrity, Flexibility and Efficiency.

From a corporate strategy perspective, not only does Bayer have a “right to play” in this market, it has a “right to win”. The vision for the Bayer Carbon Initiative (BCI) is “To be the Leading Force in Agriculture Decarbonization”. This vision is rooted in a focus on the farmer while recognizing significant shifts in policies, capital markets, consumer behaviors which all shape the value of carbon farming.

Bayer can help farmers gain value in this space through premiums in the sustainably produced food market, participation in the carbon trading market and subsidies for compliance and lower production costs. For example, Bayer estimates that the carbon sequestration market to increase 100x by 2050 with a similar increase in the carbon capture and storage markets.

³ Information synthesized from “Bayer Carbon Initiative – Executive Leadership Team Briefing, April 2021.
Bayer’s position as the agriculture science leader allows it to be recognized by farmers as the leading sources for the identification of the value in sustainable agriculture solutions and a driver for enterprise value. This leadership will focus on science, markets and policy advocacy.

The portfolio of initiatives involve the carbon offset markets and opportunities centered on sustainability and increased yield. Initiatives across multiple concepts have been piloted in the US, the EMEA (European, Middle East and Asia) markets, Brazil and India. For example, with rice production responsible for significant GHG, innovations in the reduction of water use and cultivation costs show opportunities for continued market leadership. Additionally, collaboration and partnerships in the Brazil markets are showing progress in sustainable farming. Bayer realizes that carbon removals are critical to a global net zero carbon production world and that agriculture offers one of the lowest costs and highest quality approaches.

As part of the BCI, focus has been placed on risk identification and mitigation for both its growers and partners. For its growers, revenue and soil benefits will arrive from a combination of sustainable farming practices, innovative validation of carbon reducing practices and support and incentives from Bayer. This will include both on-farm validation and carbon marketing and support for practices that can validate both sequestration and removal. Contributing to Bayer’s leadership in this space is a hundred-year history of science based innovation, global reach as a trusted brand in farming, access to the data to enable both advanced and predictive analytics. Utilizing remote sensing verification, FieldView and Science Based Modeling, strategy to this point has focused on being the nucleus of the four components in a model that
sustainably and reliably creates transparency to this complicated environment. Namely; premiums and service provision for Growers, certification of data and credits for Agencies, carbon credits for carbon Credit Buyers, value chain validation and transparency for Partners.

The ability to scale success the US market is contingent on success in four areas.

1) Exploiting the market potential in corn and soy acres while engaging downstream companies in this highly competitive environment.

2) Utilizing the data provided by FieldView and coordinating with retail partners.

3) Develop reliable carbon accounting data generated by independent bodies like Verra and Gold Standard and exploiting the interest in the carbon accounting and traceability in food and biofuels markets.

4) Understanding the ability to operate and succeed in other regions of high potential and successfully interfacing with administrative bodies at the highest levels.

Ultimately, this is an increasingly competitive market with competitors entering the market in various facets with varying strategies and models. At a minimum, nine competitors have entered this market since June 2018 with various offers for growers, variable strategies and business types.

According to Leonardo Bastos, SVP Global Commercial Ecosystems, Crop Science Division, when talking about the potential and impact of the BCI. “The same thing keeps me up at night and gets me up in the morning: There is such fantastic opportunity to help the planet while helping are farmers through improved products and process for limiting and removing carbon – I want Bayer to get there first and be the best!”.
III. Case Question: What strategies should Bayer pursue to succeed in the Bayer Carbon Initiative.

As stated above, the Bayer Carbon Initiative is poised to leverage Bayer’s 100-year history as a leader for smart agriculture solutions to succeed in this critically important space. While this initiative is clearly mission critical, many options exist for the best way to engage consumers, growers and partners to lessen the climate changing effects of agriculture. Taking into account the complex nature of climate change, the interconnected nature of mitigation efforts and the carbon trading markets, the prior work Bayer has completed, the strong relationship Bayer has with its growers and retailers, Bayer is looking for innovative ways to challenge the current thinking and develop new strategies to help the world address climate change.